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Articles in This Slice

VOLUME IV SLICE II

Bohemia to Borgia, Francis

BOHEMIA[1] (Ger. *Böhmen*, Czech *Čechy*, Lat. *Bohemia*), a kingdom and crownland of Austria, bounded N.E. by Prussian Silesia, S.E. by Moravia and Lower Austria, S. by Upper Austria, S.W. by Bavaria and N.W. by Saxony. It has an area of 20,060 sq. m., or about two-thirds the size of Scotland, and forms the principal province of the Austrian empire. Situated in the geographical centre of the European continent, at about equal distance from all the European seas, enclosed by high mountains, and nevertheless easily accessible through Moravia from the Danubian plain and opened by the valley of the Elbe to the German plain, Bohemia was bound to play a leading part in the cultural development of Europe. It became early the scene of important historical events, the avenue and junction of the migration of peoples; and it forms the borderland between the German and Slavonic worlds. 121

Geography.—Bohemia has the form of an irregular rhomb, of which the northernmost place, Buchberg, just above Hainspach, is at the same time the farthest north in the whole Austro-Hungarian monarchy. From an orographic point of view, Bohemia constitutes amongst the Austrian provinces a separate massif, bordered on three sides by mountain ranges: on the S.W. by the Böhmerwald or Bohemian Forest; on the N.W. by the Erzgebirge or Ore Mountains; and on the N.E. by the Riesengebirge or Giant Mountains and other ranges of the Sudetes. The Böhmerwald, which, like its parallel range, the Sudetes, has a general direction from S.E. to N.W., 122 is divided by the pass of Neumark into two parts. The northern part (Czech *Cesky Les*) attains in the massif of Czerkov an altitude of 3300 ft., but the southern part (Czech *Šumava*) is at the same time the highest and the most picturesque part of the range, including on the Bohemian side the Osser (4053 ft.) and the Plöckenstein (4513 ft.), although the highest peak, the Arber (4872), is in Bavaria. The beauty of this range of mountains consists in its pure crystalline torrents, in the numerous blue lakes of its valleys, and above all in the magnificent forests of oak and pine with which its sides are covered. The pass of Neumark, called also the pass of Neugedein, has always been the principal approach to Bohemia from Germany. It stretches towards the east, above the small town of Taus (Czech *Domažlice*, once called *Tuhošt*, *i.e.* the Fortress), and is the place where some of the bloodiest battles in the history of Bohemia were fought. Here in the first half of the 7th century Samo repulsed the invading hordes of the Avars, which threatened the independence of the newly-settled Slavonic inhabitants; here also Wratislas II. defeated the German emperor Henry III. in a two-days' battle (August 22 and 23, 1040). It was in the same place that the Hussites gained in 1431 one of their greatest victories against a German army of crusaders, and another similar German army was vanquished here by George of Poděbrad.

The Erzgebirge (Czech *Rudo Horí*), which form the north-west frontier, have an average altitude of 2600 ft., and as their highest point, the Keilberg (4080 ft.). The numerous mining villages, the great number of cultivated areas and the easy passes, traversed by good roads, give those mountains in many places the aspect of a hilly undulating plain. Several of the villages are built very near the summit of the mountains, and one of them, Gottesgab (pop. about 1500), lies at an altitude of 3345 ft., the highest place in Bohemia and central Germany. To the west the Erzgebirge combine through the Elstergebirge with the Fichtelgebirge, which in their turn are united with the Böhmerwald through the plateau of Waldsassen. To the east the Erzgebirge are separated from the Elbsandsteingebirge by the Nollendorf pass, traversed by the ancient military route to Saxony; it was the route followed by Napoleon I. after the battle of Dresden (1813). To the south stretches the "Thermopylae of Bohemia," the scene of the battle of Kulm and Arbesau. A little farther to the east the Elbe escapes into Saxony at the lowest point in Bohemia (alt. 367 ft.). The north-east frontier is formed by the Sudetes, which comprise the Lausitzergebirge (2500 ft.), the Isergebirge (with the highest peak, the Tafelfichte, 3683 ft.), the Jeschkengebirge (3322 ft.), and the Riesengebirge. The Riesengebirge (Czech *Kroknosě*) are, after the Alps, among the highest mountains of central Europe, and attain in the Schneekoppe an altitude of 5264 ft. The last groups of the Sudetes in Bohemia are the Heuscheuergebirge (2532 ft.) and the Adlergebirge (3664 ft.). The fourth side of the rhomb is formed by the so-called Bohemian-Moravian Hills, a plateau or broad series of low hills, composed of primitive rocks, and attaining in some places an altitude of 2500 ft.

The interior of Bohemia has sometimes been compared to a deep basin; but for the most part it is an undulating plateau, over 1000 ft. high, formed by a succession of terraces, which gradually slope down from south to north. Its lowest-lying points are not in the middle but in the north, in the valley of the Elbe, and the country can be divided into two parts by a line passing through Hohenmauth-Prague-Komotau. The part lying to the south of this line can be designated as highland, and only the part north of it as lowland. The mountain-ranges of the interior of Bohemia are the Brdywald (2798 ft.) in the middle; the Tepler Gebirge (2657 ft.), the Karsbader Gebirge (3057 ft.) and the Kaiserwald (3238 ft.), in the north-west part; while the northern corner is occupied by the Mittelgebirge (2739 ft.), a volcanic massif, stretching on both sides of the Elbe.

Bohemia belongs to the watershed of the Elbe, which rises within the territory and receives on the right the

Iser and the Polzen, and on the left the Adler; the Eger with its affluent the Tepl; the Biela and the Moldau. But the principal river of Bohemia, from every point of view, is the Moldau (Czech *Vltava*), not the Elbe. A glance at the hydrographic structure of Bohemia, which is of such a striking regularity, shows us that the Moldau is the main stem, while the Elbe and the other rivers are only lateral branches; moreover, the Elbe below Melnik, the point of its confluence with the Moldau, follows the general direction of the Moldau. Besides, the Moldau is the principal commercial artery of the country, being navigable below Budweis, while the Upper-Elbe is not navigable; its basin (11,890 sq. m.) is twice as great as that of the Elbe, and its width and depth are also greater. It has a length of 270 m., 47 m. longer than the Upper-Elbe, but it runs through a deep and narrow valley, in which there is neither road nor railway, extending from above Budweis to about 15 m. south of Prague. The Moldau receives on the right the Lužniza and the Sazawa and on the left the Wottawa and the Beraun. The Beraun is formed by the union of the Mies with the Radbusa, Angel and Uslawa, and is the third most important river of the country. There are only a few lakes, which are mostly found at high altitudes.

Climate.—Bohemia has a continental, generally healthy climate, which varies much in different parts of the country. It is mildest in the centre, where, *e.g.* at Prague, the mean annual temperature is 48.5° F. The rainfall varies also according to the districts, the rainy season being the summer. Thus the mean annual rainfall in the interior of Bohemia is 18 in., in the Riesengebirge 40 in., while in the Böhmerwald it reaches 60 to 70 in.

Agriculture.—Favoured with a suitable climate and inhabited by a thriving rural population, Bohemia is very highly developed in the matter of agriculture. Over 50% of the whole area is under cultivation and the soil is in many parts very fertile, the best-known regions being the “Golden Road” round Königgrätz, the “Paradise” round Teplitz, and the “Garden of Bohemia” round Leitmeritz. The principal products are oats, rye, barley and wheat, but since the competition of Hungarian wheat large tracts of land have been converted to the cultivation of beetroot. The potato crop, which forms the staple food of the people, is great; the Saaz district is celebrated for hops, and the flax is also of a good quality. Fruit, especially plums, is very abundant and constitutes a great article of export. The forests cover 29.01% of the total area; meadows, 10.05, pastures 5.05, and gardens 1.35%. Cattle-rearing is not so well developed as agriculture, but great flocks of geese are reared, especially in the south, and bee-cultivation constitutes another important industry. Pisciculture has been for centuries successfully pursued by the Bohemian peasants, and the attempts recently made for the rearing of silkworms have met with fair success.

Minerals.—Except salt, which is entirely absent, almost every useful metal and mineral is to be found. First in importance, both in quantity and in value, come lignite and coal. Some of the richest lignite fields in Europe are found in the north-east corner of Bohemia round Brüx, Dux, Falkenau, Ossegg and Teplitz. Coal is mined round Kladno, Buschtěhrad, Pilsen, Schlan, Rakonitz, Nürschan and Radnitz, the last-named place containing the oldest coal mines of Bohemia (17th century). Iron ores are found at Krušnahora and Nučic, and the principal foundries are round Kladno and Königshof. Owing to the improvements in refining, Bohemia has become an important centre of the iron industry. Silver is extracted at Přibram and Joachimsthal, but the silver mines near Kuttenberg, famous in the middle ages, are now abandoned. Lead is extracted at Přibram, tin at Graupen in the Erzgebirge, the only place in Austria where this metal is found. Antimony is extracted at Milleschau near Tabor; uranium and radium near Joachimsthal; graphite near Krumau and Budweis; porcelain-earth near Carlsbad. Other minerals found in various places of Bohemia are copper, sulphur, cobalt, alum, nickel, arsenic and various sorts of precious stone, like the Bohemian garnet (pyrope), and building stone. A large amount of peat is collected, especially in the south-west of Bohemia, as well as a great quantity of asphalt.

Bohemia possesses over two hundred mineral springs, but only a few are used for medicinal purposes. Among them are some of the most celebrated mineral springs in the world, such as Carlsbad, Marienbad, Franzensbad, Teplitz-Schönau and Bilin. Other springs of importance are Püllna, Sedlitz and Seidschitz near Brüx; Giesshübl near Carlsbad; Liebwerda, Königswart, Sangerberg, Neudorf, Tetschen, Johannisbad, situated at the foot of the Schneekoppe, &c.

Manufactures and Commerce.—From an industrial point of view, Bohemia takes the first rank amongst the Austrian provinces, and at the same time is one of the greatest manufacturing centres of Europe. Rich as the country is in coal and iron, and in water supplies which can be transformed into motive power, the inhabitants were not slow to utilize these advantages, so that the industry of Bohemia made enormous strides during the last half of the 19th century. The glass industry was introduced from Venice in the 13th century and soon attained a vast importance; the factories are in the neighbourhood of the mountains, where minerals, and especially silica and fuel, are plentiful. The finest product, the crystal-glass, is made round Haida and Steinschönau. The very extensive porcelain industry is concentrated in and around Carlsbad. The textile industry stands in the front rank and is mostly concentrated in the north-east corner of Bohemia, round Reichenberg, and in the valley of the Lower Elbe. The cloth manufacture is located at Reichenberg; Rumburg and Trautenau are the centre of the linen industry; woollen yarns are made at Aussig and Asch. Lace, which is pursued as a home-industry in the Erzgebirge region, has its principal centre at Weipert, while Strakonitz has the speciality of the manufacture of red fezes (Turkish caps). The metallurgic industries, favoured by the abundance of coal and iron, are concentrated round the mines. Industrial and agricultural machinery are manufactured at Reichenberg, Pilsen and Prague, and at the last-named place is also to be found a great establishment for the production of railway rolling-stock. Sugar refining is another industry, which, although of recent date, has had a very great development, and the breweries produce a beer which is appreciated all over the world. Other important branches of industry are:—the manufacture of chemicals at Prague and Aussig; pencils at Budweis; musical instruments at Graslitz and Schönbach; paper, leather, dyeing and calico-printing. Hand-in-hand with the industrial activity of the country goes its commercial development, which is stimulated by an extensive railway system, good roads and navigable rivers. The centre of the railway system, which had in 1898 a length of some 3500 m., or 30% of the total length of the Austrian railways, is Prague; and through the Elbe Bohemia has easy access to the sea for its export trade.

Population and Administration.—Bohemia had in 1900 a population of 6,318,280, which corresponds to 315 inhabitants per square mile. As regards numbers, it occupies the second place amongst the Austrian provinces, coming after Galicia, and as regards density of population it stands third, Silesia and Lower Austria, which contains Vienna, standing higher. In 1800 the population was a little over 3,000,000. According to nationality, about 35% are Germans and 65% Czechs. The Czechs occupy the middle of the country, as well as its south and south-east region, while the Germans are concentrated near its borders, especially in the north and west, and

are also found all over the country in the large towns. Besides, there are numerous German-speaking enclaves situated in purely Czech districts; on the other hand, the Czechs have shown a tendency to invade the purely German mining and manufacturing districts. Notwithstanding its rich natural resources and its great industrial development, Bohemia sends out a steady flow of emigrants, who either settle in the other provinces of the monarchy, in Germany and in Russia, or cross the Atlantic to America. To the Roman Catholic Church belong 96% of the total population; Bohemia is divided into the archbishopric of Prague, and the three bishoprics of Budweis, Königgrätz and Leitmeritz.

Education is well advanced, and Bohemia has the lowest proportion of illiterates amongst the Austrian provinces. At the head of the educational establishments stand the two universities at Prague, one German and the other Czech.

Bohemia sends 130 deputies to the Reichsrat at Vienna; the local diet, to which belong *ex officio* the archbishop, the three bishops, and the two rectors of the universities, consists of 242 members. For administrative purposes Bohemia is divided into ninety-four districts and two autonomous municipalities, Prague (pop. 204,478), the capital, and Reichenberg (34,204). Other important towns are Pilsen (68,292), Budweis (39,360), Aussig (37,255), Schönau (24,110), Eger (23,665), Warnsdorf (21,150), Brüx (21,525), Gablonz (21,086), Asch (18,675), Kladno (18,600), Pardubitz (17,029), Saaz (16,168), Komotau (15,925), Kolin (15,025), Kuttenberg (14,799), Trautenau (14,777), Carlsbad (14,640), Přibram (13,576), Jungbunzlau (13,479), Leitmeritz (13,075), Chrudim (13,017), Dux (11,921), Bodenbach (10,782), Tabor (10,692), Bohmisch-Leipa (10,674), Rumburg (10,382), Weipert (10,037).

See F. Umlauft, *Die Länder Österreich-Ungarns in Wort und Bild*, (15 vols., Vienna, 1881-1889), vol. vii.; Mikowec, *Altertümer und Denkwürdigkeiten Bohmen's* (2 vols., Prague, 1859-1865); F. Rivnáč, *Reisehandbuch fur das Konigreich Bohmen* (Prague, 1882), very useful for its numerous and detailed historical notes.

(O. Br.)

History

The country derives its name from the Boii, a Celtic tribe which in the earliest historical period inhabited part of the land. According to very ancient traditions accepted by the modern historians of Bohemia, the Boii, whose capital was called Boiohemum, were weakened by continual warfare with neighbouring tribes, and finally subdued by the Teutonic tribe of the Marcomanni (about 12 B.C.). The Marcomanni were afterwards expelled by other Teutonic tribes, and eventually Bohemia was conquered by Slavic tribes, of whom the Čechs (see Czech) were the most important. The date of the arrival of the Čechs in Bohemia is very uncertain, and the scanty references to the country in classical and Byzantine writers are rather misleading than otherwise. Recent archaeological research has proved the existence of Slavic inhabitants in Bohemia as far back as the beginning of the Christian era. The Čechs appear to have become the masters of the country in the 5th century. The first of their rulers mentioned in history is Samo, who is stated to have defeated the Avars, a Turanian tribe which had for a time obtained the overlordship over Bohemia. Samo also defeated the Franks in a great battle that took place at Wogatisburg (630), probably near the site of the present town of Eger. After the death of Samo the history of Bohemia again becomes absolutely obscure for about 130 years. The next events that are recorded by the oldest chroniclers, such as Cosmas, refer to the foundation of a Bohemian principality by Krok (or Crocus) and his daughter Libussa. The latter is said to have married Přemysl, a peasant who was found ploughing his field—a legend that is common in most Slavic countries. Beginning with this semi-mythic ruler, the ancient chroniclers have constructed a continuous list of Přemyslide princes. Neither the deeds attributed to these princes nor the dates of their reigns can be considered as historical.

Slav Conquest.

From the time of the introduction of Christianity into Bohemia the history of the country becomes less obscure. The first attempts to introduce Christianity undoubtedly came from Germany. They met with little success, as innate distrust of the Germans naturally rendered the Bohemians unfavourable to a creed which reached them from the realm of their western neighbours. Matters were different when Christianity approached them from Moravia, where its doctrine had been taught by Cyrillus and Methodius—Greek monks from Thessalonica. About the year 873 the Bohemian prince Bořivoj was baptized by Methodius, and the Bohemians now rapidly adopted the Christian faith. Of the rulers of Bohemia the most famous at this period was Wenceslas, surnamed the Holy, who in 935 was murdered by his brother Boleslav, and who was afterwards canonized by the Church of Rome. As Wenceslas had been an ally of Germany, his murder resulted in a war with that country, in which, as far as we can judge by the scanty records of the time. Boleslav, the brother and successor of Wenceslas, was on the whole successful. During the reigns of Boleslav and his son, Boleslav II., Bohemia extended its frontiers in several directions. Boleslav II. indeed established his rule not only over Bohemia and Moravia, but also over a large part of Silesia, and over that part of Poland which is now the Austrian province of Galicia. Like most Slavic states at this and even a later period, the great Bohemian empire of Boleslav II. did not endure long. Boleslav III., son of Boleslav II., lost all his foreign possessions to Boleslav the Great, king of Poland. During his reign Bohemia was involved in constant civil war, caused by the dissensions between Boleslav III. and his brothers Jaromir and Ulrick. Though the prince succeeded in expelling his brothers from the country, his cruelty induced the Bohemians to dethrone him and to choose as their ruler the Polish prince Vladivoj, brother of Boleslav the Great, and son of the Bohemian princess Ďubravka (Dobrawa). Vladivoj attempted to strengthen his hold over Bohemia by securing the aid of Germany. He consented not only to continue to pay the tribute which the Germans had already obtained from several previous rulers of Bohemia, but also to become a vassal of the German empire and to receive the German title of duke. This state continued when after the death of Vladivoj the Přemyslide dynasty was restored. The Přemyslide prince Břetislav I. (1037-1055) restored the former power of Bohemia, and again added Moravia, Silesia and a considerable part of Poland to the Bohemian dominions. To obviate the incessant struggles which had endangered the land at every vacancy of the throne, Břetislav, with the consent of the nobles, decreed that the oldest member of the house of Přemysl should be the ruler of Bohemia. Břetislav was therefore succeeded first by his eldest son Spitihněv, and then by his second son Vratislav.

Wenceslas

Boleslav.

Vladivoj.

Břetislav I.

In 1088 Vratislav obtained the title of king from the emperor Henry IV., whom he had assisted in the struggle with the papal see which is known as the contest about investitures. Though the title of king was only conferred on Vratislav personally, the German king, Conrad III., conferred on the Bohemian prince Sobeslav (1125-1140) the title of hereditary cupbearer of the Empire, thus granting a certain influence on the election of the emperors to Bohemia, which hitherto had only obligations towards the Empire but no part in its government. In 1156 the emperor Frederick I. Barbarossa ceded Upper Lusatia to the Bohemian prince Vladislav II., and conferred on him the title of king on condition of his taking part in Frederick's Italian campaigns. It was intended that that title should henceforth be hereditary, but it again fell into abeyance during the struggles between the Přemyslide princes which followed the abdication of Vladislav in 1173.

Vratislav becomes "king".

The consequences of these constant internal struggles were twofold; the German influence became stronger, and the power of the sovereign declined, as the nobility on whose support the competitors for the crown were obliged to rely constantly obtained new privileges. In 1197 Přemysl Ottakar became undisputed ruler of Bohemia, and he was crowned as king in the following year. The royal title of the Bohemian sovereigns was continued uninterruptedly from that date. Wenceslas I. (1230-1253) succeeded his father as king of Bohemia without opposition. The last years of his reign were troubled by internal discord. Wenceslas's son, Přemysl Ottakar II., who under the sovereignty of his father ruled Moravia, became for a time the chief leader of the malcontents. A reconciliation between son and father, however, took place before the latter's death. Přemysl Ottakar II. was one of the greatest of Bohemia's kings. He had during the lifetime of his father obtained possession of the archduchies of Austria, and, about the time of his accession to the Bohemian throne, the nobility of Styria also recognized him as their ruler. These extensions of his dominions involved Přemysl Ottakar II. in repeated wars with Hungary. In 1260 he decisively defeated Bela, king of Hungary, in the great battle of Kressenbrunn. After this victory Ottakar's power rose to its greatest height. He now obtained possession of Carinthia, Istria and parts of northern Italy. His possessions extended from the Giant Mountains in Bohemia to the Adriatic, and included almost all the parts of the present Habsburg empire west of the Leitha. His contemporaries called Ottakar "the man of gold" because of his great wealth, or "the man of iron" because of his military power. From political rather than racial causes Ottakar favoured the immigration of Germans into his dominions. He hoped to find in the German townsmen a counterpoise to the overwhelming power of the Bohemian nobility. In 1273 Rudolph, count of Habsburg, was elected king of the Romans. It is very probable that the German crown had previously been offered to Ottakar, but that he had refused it. Several causes, among others his Slavic nationality, which was likely to render him obnoxious to the Germans, contributed to his decision. As Rudolph immediately claimed as vacant fiefs of the Empire most of the lands held by Ottakar, war was inevitable. Ottakar was deserted by many of his new subjects, and even by part of the Bohemian nobility. He was therefore unable to resist the German king, and was obliged to surrender to him all his lands except Bohemia and Moravia, and to recognize Rudolph as his overlord. New dissensions between the two sovereigns broke out almost immediately. In 1278 Ottakar invaded the Austrian duchies, now under the rule of Rudolph, but was defeated and killed at the battle of Durnkrut on the Marchfeld.

Ottakar II.

Ottakar's son, Wenceslas II., was only seven years of age at the death of his father, and Otto of Brandenburg, a nephew of Ottakar, for a time governed Bohemia as guardian of the young sovereign. Otto's rule was very unpopular, an insurrection broke out against him, and Bohemia was for a time in a state of complete anarchy. The country was at last pacified through the intervention of Rudolph of Habsburg, and at the age of twelve Wenceslas became nominal ruler of the country. All power was, however, in the hands of Zavis of Falkenstein, one of the great Bohemian nobles, who had married the king's mother, Kunegunda. The power of Zavis at last became invidious to the king, by whose order he was beheaded in 1290. Wenceslas, though only nineteen years of age, henceforth governed Bohemia himself, and his short reign was a period of great happiness for the country. Poland also accepted the rule of Wenceslas and the Hungarian crown was offered to him. Towards the end of his reign Wenceslas became involved in war with Albert, archduke of Austria, afterwards king of the Romans. While preparing to invade Austria Wenceslas died suddenly (1305). His son and successor, Wenceslas III., was then only sixteen years of age, and he only ruled over Bohemia for one year. While planning a warlike expedition against Poland, on which country the Bohemian sovereigns now again maintained their claim, he was murdered by unknown assassins (1306). With him ended the rule of the Přemyslide dynasty over Bohemia.

Wenceslas II.

Albert, king of the Romans, declared that Bohemia was a vacant fief of the Empire, and, mainly by intimidation, induced the Bohemians to elect his son Rudolph as their sovereign; but Rudolph died after a reign of only one year. Though the Habsburg princes at this period already claimed a hereditary right to the Bohemian throne, the Bohemians determined to maintain their right of electing their sovereign, and they chose Henry, duke of Carinthia, who had married a daughter of King Wenceslas II. Henry soon became unpopular, as he was accused of unduly favouring the German settlers in Bohemia. It was decided to depose him, and the choice of the Bohemians now fell on John of Luxemburg, son of Henry, king of the Romans. The Luxemburg dynasty henceforth ruled over Bohemia up to the time of its extinction at the death of Sigismund (1437). Though King John, by his marriage to the princess Elizabeth, a daughter of Wenceslas II., became more closely connected with Bohemia, he does not appear to have felt much interest in that country. Most of his life was spent in other lands, his campaigns ranging from Italy in the south to Lithuania in the north. It became proverbial "that nothing could be done in the world without the help of God and of the king of Bohemia." The policy of John was founded on a close alliance with France, the country for which he felt most sympathy. Fighting as an ally of France he fell at the battle of Crécy (1346).

John of Luxemburg.

He was succeeded as king of Bohemia by his son Charles, whom the German electors had previously elected as their sovereign at Rense (1346). Charles proved one of the greatest rulers of Bohemia, where his memory is still revered. Prague was his favourite residence, and by the foundation of the nové město (new town) he greatly enlarged the city, which now had three times its former extent, and soon also trebled its population. He also added greatly to the importance of the city by founding the famous university of Prague. Charles succeeded in re-establishing order in Bohemia. The country had been in a very disturbed state in consequence of feuds that were incessant during the reign of John, who had almost always been absent from Bohemia. Charles also attempted to codify the obscure and contradictory laws of Bohemia; but this attempt failed through the resistance of the powerful nobility of the country. During the reign of Charles, the first symptoms of that movement in favour of church reform that afterwards acquired a world-

King Charles.

wide importance, appeared in Bohemia. As Charles has often been accused of undue subserviency to the Church of Rome, it should be mentioned that he granted his protection to several priests who favoured the cause of church reform. In his foreign policy Charles differed from his father. The relations with France gradually became colder, and at the end of his reign Charles favoured an alliance with England; he died in 1378 at the age of sixty-two, prematurely exhausted by arduous work.

Charles was succeeded by his son Wenceslas, who was then seventeen years of age. His reign marks the decline of the rule of the house of Luxemburg over Bohemia. He was a weak and incapable sovereign, but the very exaggerated accusations against him, which are found principally in the works of older historians, are mainly due to the fact that the king and to a larger extent his queen, Sophia, for a time furthered the cause of church reform, thus incurring the displeasure of Romanist writers. During the earlier part of the reign of Wenceslas a continual struggle took place between the king and the powerful Bohemian nobles, who indeed twice imprisoned their sovereign. Wenceslas also became involved in a dispute with the archbishop, which resulted in the death of the famous John of Nepomuk.

Wenceslas IV.

The later part of the reign of Wenceslas is a record of incipient religious conflict. The hold of the Church of Rome on Bohemia had already been weakened during the reign of King Charles by attacks on the immorality of the clergy, which proceeded from pious priests such as Milić and Waldhauser. The church schism, during which the rival pontiffs assailed each other with all the wild threats and objurgations of medieval theological strife, necessarily alienated the Bohemians to a yet greater extent. Almost the whole Bohemian nation therefore espoused the cause of Huss (*q.v.*). Wenceslas on the occasion of these disputes displayed the weakness and irresolution that always characterized him, but Queen Sophia openly favoured the cause of Huss, who for some time was her confessor. Huss was tried before the council of Constance (*q.v.*), to which he had proceeded with a letter of safe conduct given by Wenceslas's brother Sigismund, king of the Romans. He was declared a heretic and burnt on the 6th of July 1415. The inevitable and immediate result of this event was the outbreak of civil war in Bohemia, where Huss was greatly revered by the large majority of the population. The nobles of Bohemia and Moravia met at Prague on the 2nd of September 1415, and sent to the council the famed *Protestatio Bohemorum*, in which they strongly protested against the execution of Huss, "a good, just and catholic man who had for many years been favourably known in the Kingdom by his life, conduct and fame, and who had been convicted of no offence." They further declared that all who affirmed that heresy existed in Bohemia were "liars, vile traitors and calumniators of Bohemia and Moravia, the worst of all heretics, full of all evil, sons of the devil." They finally stated "that they would defend the law of our Lord Jesus Christ and its pious, humble and steadfast preachers at the cost of their blood, scorning all fear and all human decrees that might be contrary to them."[2] This protest was a declaration of war against the Roman church, and marks the beginning of the Hussite wars. The council, indeed, summoned the nobles before its tribunal, but they refused to appear. A large number of the nobles and knights who had met at Prague formed a confederacy and declared that they consented to freedom of preaching the word of God on their estates, that they declined to recognize the authority of the council of Constance, but would obey the Bohemian bishops and a future pope lawfully elected. Meanwhile they declared the university of Prague the supreme authority in all matters of religion. The members of the confederacy attempted, though unsuccessfully, to induce King Wenceslas to become their leader. The Romanist nobles, who were not numerous, but some of whom owned vast estates, now also formed a confederacy, pledging themselves to support the pope and the council. After the closing of the council in 1418, Sigismund, who—Wenceslas being childless—was heir to the Bohemian throne, sent a letter to his brother, which was practically a manifesto addressed to the Bohemian people. He threatened with the severest penalties all who should continue to resist the authority of Rome. Wenceslas maintained the vacillating attitude that was characteristic of his whole reign, though Queen Sophia still extended her protection to the reformers. By doing this, indeed, she incurred the wrath of the Church to so great an extent that an act of accusation against her was drawn up at the council of Constance. Intimidated by his brother, Wenceslas now attempted to stem the current of religious enthusiasm. Immediately after the death of Huss many priests who refused to administer communion in the two kinds—now the principal tenet of the adherents of Huss—had been expelled from their parishes. Wenceslas decreed that they should be reinstated, and it was only after some hesitation that he even permitted that religious services according to the Utraquist doctrine should be held in three of the churches of Prague. Some of the more advanced reformers left Prague and formed the party known as the Taborites, from the town of Tabor which became their centre. Troubles soon broke out at Prague. When on the 30th of July 1419, the Hussite priest, John of Zelivo, was leading a procession through the streets of Prague, stones were thrown at him and his followers from the town hall of the "new town." The Hussites, led by John Žižka (*q.v.*), stormed the town-hall and threw the magistrates from its windows. On receiving the news of these riots King Wenceslas was immediately seized by an attack of apoplexy; a second fit on the 16th of August ended his life.

Huss and the Hussites.

The news of the death of the king caused renewed rioting in Prague and many other Bohemian cities, from which many Germans, mostly adherents of the Church of Rome, were expelled. Finally a temporary truce was concluded, and, early in the following year, Sigismund, who now claimed the Bohemian crown as successor of his brother, arrived at Kutna Hora (Kuttenberg). Pope Martin V. on the 1st of March 1420 proclaimed a crusade against Bohemia, and crusaders from all parts of Europe joined Sigismund's army. "On the 30th day of June the Hungarian king, Sigismund, with a large army consisting of men of various countries, as well as of Bohemians, occupied the castle of Prague, determined to conquer the city, which they considered a heretical community because they used the sacred chalice and accepted other evangelical truths."[3] But the attempt of the crusaders to conquer Prague failed, and after an attack by them on the Vitkov (now Zizkov) hill had been repulsed by the desperate bravery of the Taborites, led by Žižka, Sigismund determined to abandon the siege of Prague. An attempt of Sigismund to relieve the besieged garrison of the Vyŝehrad fortress on the outskirts of Prague also failed, as he was again entirely defeated at the battle of the Vyŝehrad (November 1, 1420).

Sigismund.

Royal authority now ceased in Bohemia. At a meeting of the diet at Caslav (June 1, 1421) Sigismund was deposed. It was decided that a Polish prince should be chosen as sovereign, and that meanwhile a provisional government, composed of twenty men belonging to the various parties, should be established. In 1422 Sigismund again invaded Bohemia, but was decisively defeated by Žižka at Nêmecký Brod (Deutschbrod). The Polish prince, Sigismund Korybutoviĉ, now arrived in Bohemia, and was recognized as regent by the large

majority of the inhabitants; but through the influence of the papal see he was recalled by the rulers of Poland after a stay of only a few months. After his departure, civil war between the moderate Hussites (Calixtines or Utraquists) and the advanced Taborite party broke out for the first time, though there had previously been isolated disturbances between them. The return of Prince Korybutoviĉ and the menace of a German invasion soon reunited the Bohemians, who gained a decisive victory over the Germans at Aussig in 1426. Shortly afterwards Korybutoviĉ, who had taken part in this great victory, incurred the dislike of the extreme Hussites, and was obliged to leave Bohemia. All hope of establishing an independent Slav dynasty in Bohemia thus came to an end. In 1427 several German princes undertook a new crusade against the Hussites. With the German and other invaders were 1000 English archers, bodyguard to Henry Beaufort, bishop of Winchester, who took part in the crusade as papal legate. The crusaders were seized by a sudden panic, both at Mies (Střibro) and at Tachau, as soon as they approached the Hussites, and they fled hurriedly across the mountains into Bavaria. Though internal disturbances again broke out, the Bohemians after this success assumed the offensive, and repeatedly invaded Hungary and the German states.

Religious War.

The impossibility of conquering Bohemia had now become obvious, and it was resolved that a council should meet at Basel (*q.v.*) to examine the demands of the Hussites. The Germans, however, influenced by Sigismund, determined to make a last attempt to subdue Bohemia by armed force. The Bohemians, as usual united in the moment of peril, defeated the Germans at Domažlice (Taus) on the 1st of August 1431, after a very short fight. In the course of the same year negotiations began at Basel, the Hussites being represented by a numerous embassy under the leadership of Prokop the Great. The negotiations proceeded very slowly, and in 1433 the Bohemians returned to their own country, accompanied, however, by envoys of the council. Dissensions had meanwhile again broken out in Bohemia, and they were now of a political rather than a religious nature. The more aristocratic Hussites raised an armed force which was known as “the army of the nobles.” The Taborites also collected their men, who formed “the army of the towns.” The two armies met at Lipan, near Kolin, on the 30th of May 1434. The Taborites were defeated, and the two Prokops and most of their other leaders perished on the battlefield. The victory of the moderate party paved the way to a reconciliation with Sigismund and the Church of Rome. The Bohemians recognized Sigismund as their sovereign, but obtained considerable concessions with regard to religious matters. These concessions, which were formulated in the so-called Compacts, granted to the Bohemians the right of communion in both kinds, and of preaching the gospel freely, and also to a certain extent limited the power of the clergy to acquire worldly goods.

The “Compacts.”

After the Compacts had been formally recognized at Iglau in Moravia, Sigismund proceeded to Prague and was accepted as king. He died in the following year (1437) and was succeeded by his son-in-law, Albert of Austria, whom the estates chose as their king. Albert died after he had reigned over Bohemia less than two years. Though it was known that Albert’s widow Elizabeth would shortly give birth to a child, the question as to the succession to the throne again arose; for it was only in 1627 that the question whether the Bohemian crown was elective or hereditary was decided for ever. The nobles formed two parties, one of which, the national one, had George of Poděbrad (*q.v.*) as its leader. Ulrich of Rosenberg was the leader of the Roman or Austrian division of the nobility. The two parties finally came to an agreement known as the “Letter of Peace” (*list mirný*). Those who signed it pledged themselves to recognise the Compacts, and to support as archbishop of Prague, John of Rokycan, who had been chosen by the estates in accordance with an agreement made simultaneously with the Compacts, but whom the Church of Rome refused to recognize. On the other hand, the national party abandoned the candidature to the throne of Prince Casimir of Poland, thus paving the way to the eventual succession of Albert’s heir. On the 22nd of February 1440 Queen Elizabeth gave birth to a son, who received the name of Ladislas. The Bohemians formally acknowledged him as their king, though only after their crown had been declined by Albert, duke of Bavaria. Ladislas remained in Austria under the guardianship of his uncle Frederick, duke of Styria, afterwards the emperor Frederick III., and Bohemia, still without regular government, continued to be the scene of constant conflicts between the rival parties of the nobility. In 1446 a general meeting of the estates of Bohemia together with those of Moravia, Silesia and Lusatia—and so-called “lands of the Bohemian crown”—took place. This meeting has exceptional importance for the constitutional history of Bohemia. It was decreed that at the meeting of the estates their members should be divided into three bodies—known as *curiae*—representing the nobles, the knights and the towns. These *curiae* were to deliberate separately and only to meet for a final decision. An attempt made at this meeting to appoint a regent was unsuccessful. The negotiations with the papal see continued meanwhile, but led to no result, as the members of the Roman party used their influence at the papal court for the purpose of dissuading it from granting any concessions to their countrymen. Shortly after the termination of the diet of 1446 George of Poděbrad therefore determined to appeal to the fortune of war. He assembled a considerable army at Kutna Hora and marched on Prague (1448). He occupied the town almost without resistance and assumed the regency over the kingdom. The diet in 1451 recognized his title, which was also sanctioned by the emperor Frederick III., guardian of the young king. Poděbrad was none the less opposed, almost from the first, by the Romanists, who even concluded an alliance against him with their extreme opponents, Kolda of Žampach and the other remaining Taborites. In October 1453 Ladislas arrived in Bohemia and was crowned king at Prague; but he died somewhat suddenly on the 23rd of November 1457. George of Poděbrad has from the first frequently been accused of having poisoned him, but historical research has proved that this accusation is entirely unfounded. The Bohemian throne was now again vacant, for, when electing Ladislas the estates had reaffirmed the elective character of the monarchy. Though there were several foreign candidates, the estates unanimously elected George of Poděbrad, who had now for some time administered the country. Though the Romanist lords, whom Poděbrad had for a time won over, also voted for him, the election was considered a great victory of the national party and was welcomed with enthusiasm by the citizens of Prague.

George of Poděbrad.

During the earlier and more prosperous part of his reign the policy of King George was founded on a firm alliance with Matthias Corvinus, king of Hungary, through whose influence he was crowned by the Romanist bishop of Waitzen. The reign of King George, whose principal supporters were the men of the smaller nobility and of the towns, was at first very prosperous. After a certain time, however, some of the Romanist nobles became hostile to the king, and, partly through their influence, he became involved in a protracted struggle with the papal see. It was in consequence of this struggle that some of George’s far-reaching plans—he endeavoured for a time to obtain the supremacy over Germany—failed. After the negotiations with Rome had

proved unsuccessful George assembled the estates at Prague in 1452 and declared that he would to his death remain true to the communion in both kinds, and that he was ready to risk his life and his crown in the defence of his faith. The Romanist party in Bohemia became yet more embittered against the king, and at a meeting at Zelena Hora (Grünberg) in 1465 many nobles of the Roman religion joined in a confederacy against him. In the following year Pope Paul II. granted his moral support to the confederates by pronouncing sentence of excommunication against George of Poděbrad and by releasing all Bohemians from their oath of allegiance to him. It was also through papal influence that King Matthias of Hungary, deserting his former ally, supported the lords of the league of Zelena Hora. Desultory warfare broke out between the two parties, in which George was at first successful; but fortune changed when the king of Hungary invaded Moravia and obtained possession of Brünn, the capital of the country. At a meeting of the Catholic nobles of Bohemia and Moravia at Olmütz in Moravia, Matthias was proclaimed king of Bohemia (May 3, 1469). In the following year George obtained some successes over his rival, but his death in 1471 for a time put a stop to the war. George of Poděbrad, the only Hussite king of Bohemia, has always, with Charles IV., been the ruler of Bohemia whose memory has most endeared itself to his countrymen.

George of Poděbrad had undoubtedly during the more prosperous part of his reign intended to found a national dynasty. In later years, however, hope of obtaining aid from Poland in his struggle against King Matthias induced him to offer the succession to the Bohemian throne to Vladislav (Wladislaus, Ladislaus), son of Casimir, king of Poland. No formal agreement was made, and at the death of George many Bohemian nobles supported the claim of Matthias of Hungary, who had already been proclaimed king of Bohemia. Protracted negotiations ensued, but they ended by the election of Prince Vladislav of Poland at Kutna Hora, the 27th of May 1471. This election was a victory of the national party, and may be considered as evidence of the strong anti-clerical feeling which then prevailed in Bohemia; for Matthias was an unconditional adherent of Rome, while the Polish envoys who represented Vladislav promised that he would maintain the Compacts. At the beginning of his reign the new king was involved in a struggle with Matthias of Hungary, who maintained his claim to the Bohemian throne. Prolonged desultory warfare continued up to 1478, when a treaty concluded at Olmütz secured Bohemia to Vladislav; Matthias was to retain the so-called “lands of the Bohemian crown”—Moravia, Silesia and Lusatia—during his lifetime, and they were to be restored to Bohemia after his death. Though Vladislav was faithful to his promise of maintaining the Compacts, and did not attempt to prevent the Bohemians from receiving the communion in both kinds, yet his policy was on the whole a reactionary one, both as regards matters of state and the religious controversies. The king appointed as government officials at Prague men of that section of the Utraquist party that was nearest to Rome, while a severe persecution of the extreme Hussites known as the Bohemian Brethren took place (see Hussites). Serious riots took place at Prague, and the more advanced Hussites stormed the three town halls of the city. The nobles of the same faith also formed a league to guard themselves against the menaced reaction. A meeting of all the estates at Kutna Hora in 1485, however, for a time restored peace. Both parties agreed to respect the religious views of their opponents and to abstain from all violence, and the Compacts were again confirmed.

Vladislav of Poland.

As regards matters of state the reign of Vladislav is marked by a decrease of the royal prerogative, while the power of the nobility attained an unprecedented height, at the expense, not only of the royal power, but also of the rights of the townsmen and peasants. A decree of 1487 practically established serfdom in Bohemia, where it had hitherto been almost unknown. It is impossible to exaggerate the importance of this measure for the future of Bohemia. The rulers of the country were henceforth unable to rely on that numerous sturdy and independent peasantry of which the armies of Žižka and the Prokops had mainly consisted. Various enactments belonging to this reign also curtailed the rights of the Bohemian townsmen. A decree known as the “regulations of King Vladislav” codified these changes. It enumerated all the rights of the nobles and knights, but entirely ignored those of the towns. It was tacitly assumed that the townsmen had no inherent rights, but only such privileges as might be granted them by their sovereign with the consent of the nobles and knights. Civil discord was the inevitable consequence of these enactments. Several meeting? of the diet took place at which the towns were not represented. The latter in 1513 formed a confederacy to defend their rights, and chose Prince Bartholomew of Münsterberg—a grandson of King George—as their leader.

Vladislav was elected king of Hungary in 1490 and many of the events of his later life belong to the history of Hungary. He married in 1502 Anna de Candale, who was connected with the royal family of France. He had two children by her, Anna, who afterwards married the archduke Ferdinand of Austria, and Louis. Vladislav died in Hungary in 1516. His successor was his son Louis, who had already been crowned as king of Bohemia at the age of three. According to the instructions of Vladislav, Sigismund, king of Poland, and the emperor Maximilian I. were to act as guardians of the young king. The Bohemian estates recognized this decision, but they refused to allow the guardians any right of interference in the affairs of Bohemia. The great Bohemian nobles, and in particular the supreme burgrave, Zdeněk Leo, lord of Rožmital, ruled the country almost without control. The beginning of the nominal reign of King Louis is marked by an event which had great importance for the constitutional development of Bohemia. At a meeting of the estates in 1517 known as the diet of St Wenceslas—as the members first assembled on the 28th of September, the anniversary of that saint—they came to terms and settled the questions which had been the causes of discord. The citizens renounced certain privileges which they had hitherto claimed, while the two other estates recognized their municipal autonomy and tacitly sanctioned their presence at the meetings of the diet, to which they had already been informally readmitted since 1508. At the first sitting of this diet, on the 24th of October, it was declared that the three estates had agreed henceforth “to live together in friendly intercourse, as became men belonging to the same country and race.” In 1522 Louis arrived in Bohemia from Hungary, of which country he had also been elected king. On his arrival at Prague he dismissed all the Bohemian state officials, including the powerful Leo of Rožmital. He appointed Charles of Münsterberg, a cousin of Prince Bartholomew and also a grandson of King George, as regent of Bohemia during his absences, and John of Wartenberg as burgrave. The new officials appear to have supported the more advanced Hussite party, while Rožmital and the members of the town council of Prague who had acted in concert with him had been the allies of the Romanists and those Utraquists who were nearest to the Church of Rome. The new officials thus incurred the displeasure of King Louis, who was at that moment seeking the aid of the pope in his warfare with Turkey. The king therefore reinstated Leo of Rožmital in his offices in 1525. Shortly afterwards Rožmital became involved in a feud with the lords of Rosenberg; the feud became a civil war, in which most of the nobles and cities of Bohemia

Louis.

took sides. Meanwhile Louis, who had returned to Hungary, opened his campaign against the Turks. He requested aid from his Bohemian subjects, and this was granted, by the Rosenberg faction, while Rožmital and his party purposely delayed sending any forces to Hungary. There were, therefore, but few Bohemian troops at the battle of Mohács (August 29, 1526) at which Louis was decisively defeated and perished.

The death of Louis found Bohemia in a state of great disorder, almost of anarchy. The two last kings had mainly resided in Hungary, and in spite of the temporary agreement obtained at the diet of St Wenceslas, the Bohemians had not succeeded in establishing a strong indigenous government which might have taken the place of the absentee monarchs. Archduke Ferdinand of Austria—afterwards the emperor Ferdinand I.—laid claim to the Bohemian throne as husband of Anna, daughter of King Vladislav. King Sigismund of Poland, the dukes Louis and William of Bavaria, several other German princes, as well as several Bohemian noblemen, of whom Leo of Rožmital was the most important, were also candidates. The diet resolved to entrust the election to twenty-four of their members, chosen in equal number from the three estates. These electors, on the 23rd of October (1526), chose Ferdinand of Habsburg as their king. This date is memorable, as it marks the permanent accession of the Habsburg dynasty to the Bohemian throne, though the Austrian archdukes Rudolph and Albert had previously been rulers of Bohemia for short periods. Though Ferdinand fully shared that devotion to Rome which is traditional in the Habsburg dynasty, he showed great moderation in religious matters, particularly at the beginning of his reign. His principal object was to establish the hereditary right of his dynasty to the Bohemian throne, and this object he pursued with characteristic obstinacy. When a great fire broke out at Prague in 1541, which destroyed all the state documents, Ferdinand obtained the consent of the estates to the substitution of a charter stating that he had been recognized as king in consequence of the hereditary rights of his wife Anna, in the place of the former one, which had stated that he had become king by election. This caused great dissatisfaction and was one of the principal causes of the troubles that broke out shortly afterwards. Ferdinand had in 1531, mainly through the influence of his brother the emperor Charles V., been elected king of the Romans and heir to the Empire. He henceforth took a large part in the politics of Germany, particularly after he had in 1547 concluded a treaty of peace with Turkey, which assured the safety of the eastern frontiers of his dominions. Charles V. about the same time concluded his war with France, and the brothers determined to adopt a firmer policy towards the Protestants of Germany, whose power had recently greatly increased. The latter had, about the time of the recognition of Ferdinand as king of the Romans, and partly in consequence of that event, formed at Schmalkalden a league, of which John Frederick, elector of Saxony, and Philip, landgrave of Hesse, were the leaders. War broke out in Germany in the summer of 1546, and Charles relied on the aid of his brother, while the German Protestants on the other hand appealed to their Bohemian co-religionists for aid.

Origin of the Habsburg dynasty.

Ferdinand.

Since the beginning of the Reformation in Germany the views of the Bohemian reformers had undergone a considerable change. Some of the more advanced Utraquists differed but little from the German Lutherans, while the Bohemian Brethren, who at this moment greatly increased in influence through the accession of several powerful nobles, strongly sympathized with the Protestants of Germany. Ferdinand's task of raising a Bohemian army in support of his brother was therefore a difficult one. He again employed his usual tortuous policy. He persuaded the estates to vote a general levy of the forces of the country under the somewhat disingenuous pretext that Bohemia was menaced by the Turks; for at that period no armed force could be raised in Bohemia without the consent of the estates of the realm. Ferdinand fixed the town of Kaaden on the Saxon frontier as the spot where the troops were to meet, but on his arrival there he found that many cities and nobles —particularly those who belonged to the community of the Bohemian Brethren—had sent no men. Of the soldiers who arrived many were Protestants who sympathized with their German co-religionists. The Bohemian army refused to cross the Saxon frontier, and towards the end of the year 1546 Ferdinand was obliged to disband his Bohemian forces. Early in the following year he again called on his Bohemian subjects to furnish an army in aid of his brother. Only a few of the Romanists and more retrograde Utraquists obeyed his order. The large majority of Bohemians, on the other hand, considered the moment opportune for recovering the ancient liberties of Bohemia, on which Ferdinand had encroached in various ways by claiming hereditary right to the crown and by curtailing the old privileges of the land. The estates met at Prague in March 1547, without awaiting a royal summons,—undoubtedly an unconstitutional proceeding. The assembly, in which the influence of the representatives of the town of Prague and of the knights and nobles who belonged to the Bohemian Brotherhood was predominant, had a very revolutionary character. This became yet more marked when the news of the elector of Saxony's victory at Rochlitz reached Prague. The estates demanded the re-establishment of the elective character of the Bohemian kingdom, the recognition of religious liberty for all, and various enactments limiting the royal prerogative. It was decided to entrust the management of state affairs to a committee of twelve members chosen in equal number from the three estates. Of the members of the committee chosen by the knights and nobles four belonged to the Bohemian Brotherhood. The committee decided to equip an armed force, the command of which was conferred on Kaspar Pflug of Rabenstein (d. 1576). According to his instructions he was merely to march to the Saxon frontier, and there await further orders from the estates; there seems, however, little doubt that he was secretly instructed to afford aid to the German Protestants. Pflug marched to Joachimsthal on the frontier, but refused to enter Saxon territory without a special command of the estates.

Struggles in the war against German Protestantism.

Meanwhile the great victory of the imperialists at Mühlberg had for a time crushed German Protestantism. The Bohemians were in a very difficult position. They had seriously offended their sovereign and yet afforded no aid to the German Protestants. The army of Pflug hastily dispersed, and the estates still assembled at Prague endeavoured to propitiate Ferdinand. They sent envoys to the camp of the king who, with his brother Charles, was then besieging Wittenberg. Ferdinand received the envoys better than they had perhaps expected. He indeed always maintained his plan of making Bohemia a hereditary kingdom under Habsburg rule, and of curtailing as far as possible its ancient constitution, but he did not wish to drive to despair a still warlike people. Ferdinand demanded that the Bohemians should renounce all alliances with the German Protestants, and declared that he would make his will known after his arrival in Prague. He arrived there on the 20th of July, with a large force of Spanish and Walloon mercenaries, and occupied the city almost without resistance. Ferdinand treated the nobles and knights with great forbearance, and contented himself with the confiscation of the estates of some of those who had been most compromised. On the other hand he dealt very severely with

the towns—Prague in particular. He declared that their ancient privileges should be revised—a measure that practically signified a broad confiscation of lands that belonged to the municipalities. Ferdinand also forced the townsmen to accept the control of state officials who were to be called town-judges and in Prague town-captains. These royal representatives were given almost unlimited control over municipal affairs. The Bohemian Brethren were also severely persecuted, and their bishop Augusta was imprisoned for many years.

Ferdinand's policy here was as able as it always was. The peasantry had ceased to be dangerous since the establishment of serfdom; the power of the cities was now thoroughly undermined. Ferdinand had only to deal with the nobles and knights, and he hoped that the influence of his court, and yet more that of the Jesuits, whom he established in Bohemia about this time, would gradually render them amenable to the royal will. If we consider the customs of his time Ferdinand cannot be considered as having acted with cruelty in the moment of his success. Only four of the principal leaders of the revolt—two knights, and two citizens of Prague—were sentenced to death. They were decapitated on the square outside the Hradĉany palace where the estates met on that day (August 22). This diet therefore became known as the "Krvavy'sneĕm" (bloody diet). In one of the last years of his life (1562) Ferdinand succeeded in obtaining the coronation of his eldest son Maximilian as king of Bohemia, thus ensuring to him the succession to the Bohemian throne. As Ferdinand I. acceded to the Hungarian throne at the same time as to that of Bohemia, and as he also became king of the Romans and after the death of Charles V. emperor, many events of his life do not belong to the history of Bohemia. He died in 1564.

Maximilian.

Maximilian succeeded his father as king of Bohemia without any opposition. Circumstances were greatly in his favour; he had in his youth mainly been educated by Protestant tutors, and for a time openly avowed strong sympathy for the party of church reform. This fact, which became known in Bohemia, secured for him the support of the Bohemian church reformers, while the Romanists and retrograde Utraquists were traditionally on the side of the house of Habsburg. The reign of Maximilian did not fulfil the hopes that met it. Though he published new decrees against the Bohemian Brethren, he generally refused to sanction any measures against the Protestants, in spite of the advice of the Jesuits, who were gradually obtaining great influence in Bohemia. He did nothing, however, to satisfy the expectations of the partisans of church reform, and indeed after a time began again to assist at the functions of the Roman church, from which he had long absented himself. Indifference, perhaps founded on religious scepticism, characterized the king during the many ecclesiastical disputes that played so large a part in his reign. In 1567 Maximilian, who had also succeeded his father as king of Hungary and emperor, visited the Bohemians for the first time since his accession to the throne. Like most princes of the Habsburg dynasty, he was constantly confronted at this period by the difficulty of raising funds for warfare against the Turks. When he asked the Bohemians to grant him supplies for this purpose, they immediately retorted by bringing forward their demands with regard to matters of religion. Their principal demand appears somewhat strange in the light of the events of the past. The estates expressed the wish that the celebrated Compacts should cease to form part of the laws of the country. These enactments had indeed granted freedom of worship to the most moderate Utraquists—men who, except that they claimed the right to receive the communion in both kinds, hardly differed in their faith from the Roman church. On the other hand Ferdinand I. had used the Compacts as an instrument which justified him in oppressing the Bohemian Brethren, and the advanced Utraquists, whose teaching now differed but little from that of Luther. He had argued that all those who professed doctrines differing from the Church of Rome more widely than did the retrograde Utraquists, were outside the pale of religious toleration. Maximilian, indifferent as usual to matters of religious controversy, consented to the abolition of the Compacts, and these enactments, which had once been sacred to the Bohemian people, perished unregretted by all parties. The Romanists had always hated them, believing them not to be in accord with the general custom of the papal church, while the Lutherans and Bohemian Brethren considered their suppression a guarantee of their own liberty of worship.

Abolition of the "Compacts."

In 1575 Maximilian, who had long been absent from Bohemia, returned there, as the estates refused to grant subsidies to an absentee monarch. The sittings of the diet that met in 1575 were very prolonged. The king maintained a vacillating attitude, influenced now by the threats of the Bohemians, now by the advice of the papal nuncio, who had followed him to Prague. The latter strongly represented to him how great would be the difficulties that he would encounter in his other dominions, should he make concessions to the Protestants of Bohemia. The principal demand of the Bohemians was that the "Confession of Augsburg"—a summary of Luther's teaching—should be recognized in Bohemia. They further renewed the demand, which they had already expressed at the diet of 1567, that the estates should have the right of appointing the members of the consistory—the ecclesiastical body which ruled the Utraquist church; for since the death of John of Rokycan that church had had no archbishop. After long deliberations and the king's final refusal to recognize the confession of Augsburg, the majority of the diet, consisting of members of the Bohemian brotherhood and advanced Utraquists, drew up a profession of faith that became known as the *Confessio Bohemica*. It was in most points identical with the Augsburg confession, but differed from it with regard to the doctrine of the sacrament of the Lord's Supper. Here the Bohemian profession agreed with the views of Calvin rather than with those of Luther. This is undoubtedly due to the influence of the Bohemian Brethren. The *Confessio Bohemica* was presented to Maximilian, who verbally expressed his approval, but would not consent to this being made public, and also refused his consent to the inclusion of the *Confessio* among the charters of the kingdom. Maximilian rejected the demand of the Bohemian estates, that they and not the king should in future appoint the members of the consistory. He finally, however, consented to exempt the Lutherans and advanced Utraquists from the jurisdiction of the consistory, and allowed them to choose fifteen defenders—five of whom were to belong to each of the estates—who were to have supreme control over the Lutheran church. These defenders were to appoint for each district a superintendent (moderator), who was to maintain order and discipline among the clergy. As the Bohemian Brotherhood had never recognized the consistory, that body now lost whatever influence it had still possessed. It became, indeed, subservient to the Romanist archbishopric of Prague, which had been re-established by Ferdinand I. Its members henceforth were men who on almost all points agreed with Rome, and sometimes even men who had joined the Roman church, but continued by order of their superiors to remain members of the consistory, where it was thought that their influence might be useful to their new creed.

Confessio Bohemica.

The results of the diet of 1575 were on the whole favourable to the estates, and they seem to have taken this view, for almost immediately afterwards they recognized Maximilian's eldest son Rudolph as his successor and

Rudolph.

consented to his being crowned king of Bohemia. Maximilian died in the following year, and Rudolph succeeded him without any opposition. The events of the last years of the reign of Rudolph have the greatest importance for Bohemian history, but the earlier part of his reign requires little notice. As Rudolph had been educated in Spain it was at first thought that he would treat the Bohemian church reformers with great severity. The new sovereign, however, showed with regard to the unceasing religious controversy the same apathy and indifference with which he also met matters of state. He had been from his early youth subject to fits of melancholia, and during several short periods was actually insane. Rudolph was a great patron of the arts, and he greatly contributed to the embellishment of Prague, which, as it was his favourite residence, became the centre of the vast Habsburg dominions. In 1600 the mental condition of Rudolph became so seriously impaired that the princes of the house of Habsburg thought it necessary to consider the future of the state, particularly as Rudolph had no legitimate descendants. Matthias, the eldest of his brothers, came to Prague and pointed out to Rudolph the necessity of appointing a coadjutor, should he be incapacitated from fulfilling his royal duties, and also of making arrangements concerning the succession to the throne. These suggestions were indignantly repelled by Rudolph, whose anger was greatly increased by a letter of Pope Clement VIII. The pope in a forcible though formally courteous manner pointed out to him the evil results which his neglect of his royal duties would entail on his subjects, and called on him to appoint one of the Habsburg princes his successor both to the imperial crown and to the thrones of Bohemia and Hungary. It is probable that the fear that the pope might make good the threats contained in this letter induced Rudolph, who had hitherto been indifferent to matters of religion, to become more subservient to the Roman church. The papal nuncio at Prague, in particular, appears for a time to have obtained great influence over the king. Under this influence, Rudolph in 1602 issued a decree which renewed obsolete enactments against the Bohemian Brethren that had been published by King Vladislav in 1508. The royal decree was purposely worded in an obscure manner. It referred to the Compacts that had been abolished, and was liable to an interpretation excluding from tolerance all but the Romanists and the retrograde Utraquists. It appeared therefore as a menace to the Lutherans—and all the more advanced Utraquists had now embraced that creed—as well as to the Bohemian Brethren. The estates of Bohemia met at Prague in January 1603. The discussions were very stormy. Budovec of Budova, a nobleman belonging to the community of the Bohemian Brethren, became the leader of all those who were opposed to the Church of Rome. He vigorously attacked the royal decree, which he declared to be contrary to the promises made by King Maximilian. He, however, advised the estates to vote the supplies that King Rudolph had demanded. Immediately after this vote had been passed, the diet was closed by order of the king. Though the royal power was at that period very weak in Bohemia, the open partisanship of the king encouraged the Romanist nobles, who were not numerous, but among whom were some owners of large estates, to attempt to re-establish the Roman creed on their territories. Some of these nobles committed great cruelties while attempting to obtain these forcible conversions.

Strife again broke out between Rudolph and his treacherous younger brother Matthias, who used the religious and political controversies of the time for the purpose of supplanting his brother. The formal cause of the rupture between the two princes was Rudolph’s refusal to sanction a treaty of peace with Turkey, which Matthias had concluded as his brother’s representative in Hungary. The Hungarians accepted Matthias as their ruler, and when his forces entered Moravia the estates of that country had, by Charles, lord of Žerotin, also renounced the allegiance of Rudolph. Matthias then invaded Bohemia, and invited the estates of the kingdom to meet him at Časlav (Ceslau). In consequence of a sudden revolution of feeling for which it is difficult to account, the Bohemians declined the overtures of Matthias. The estates met at Prague in March 1608, and, though again submitting their demands concerning ecclesiastical matters to Rudolph, authorized him to levy troops for the defence of Bohemia. The forces of Matthias had meanwhile entered Bohemia and had arrived at Libeň, a small town near Prague now incorporated with that city. Here Matthias, probably disappointed by the refusal of the Bohemians to join his standard, came to an understanding with his brother (June 25, 1608). Rudolph formally ceded to Matthias the government of Hungary, Moravia, and Upper and Lower Austria, but retained his rights as king of Bohemia.

Diet of 1609. Demand for religious liberty.

Soon after the conclusion of this temporary settlement, the estates of Bohemia again brought their demands before their king. Rudolph had declined to discuss all religious matters during the time that the troops of his brother occupied part of Bohemia. The diet that met on the 20th of January 1609 is one of the most important in the history of Bohemia. Here, as so frequently in the 17th century, the religious controversies were largely influenced by personal enmities. Rudolph never forgave the treachery of his brother, and was secretly negotiating (at the time when he again appeared as champion of Catholicism) with Christian of Anhalt, the leader of the German Protestants. This was known to the court of Spain, and the Bohemians also knew that the king could therefore rely on no aid from that quarter. They were therefore not intimidated when Rudolph, vacillating as ever, suddenly assumed a most truculent attitude. The estates had at their meeting in March of the previous year drawn up a document consisting of twenty-five so-called Articles, which formulated their demands with regard to matters of religion. The king now demanded that this document, which he considered illegal, should be delivered up to him for destruction. The “articles” expressed the wish that the *Confessio Bohemica* should be recognized as one of the fundamental laws of the kingdom, and that complete religious liberty should be granted to all classes. They further demanded that the Protestants—as it now became customary to call jointly the Utraquists, Lutherans and Bohemian Brethren—and the Roman Catholics should have an equal right to hold all the offices of state, and that the power of the Jesuits to acquire land should be limited. They finally asked for redress of several grievances caused by the misrule of Rudolph. This document had remained in the hands of Budova, who refused to deliver it to the king. The estates then chose twelve of their number—among whom was Count Henry Matthias Thurn—who were to negotiate with the king and his councillors. Protracted discussions ensued, and the king finally stated, on the 31st of March, that he could grant no concessions in matters of religion. On the following day the estates met under the leadership of Budova. They decided to arm for the defence of their rights, and when the king immediately afterwards dissolved the diet, it was resolved to meet again after a month, even without a royal summons. When they returned to Prague, Adam of Sternberg, the burgrave, again informed Budova that the king would grant no concessions in ecclesiastical matters. Bohemia appeared to be on the verge of a revolution. It is unnecessary to record the frequent and contradictory resolutions of the king, influenced now by the extreme Romanists, now by those of his councillors who favoured a peaceful solution. Finally—on the 9th of July 1609—Rudolph signed the famed “Letter of Majesty” which gave satisfaction to all the legitimate demands of the Bohemian Protestants. In the “Letter of Majesty” Rudolph

recognized the *Confessio Bohemica*. He further granted to the Protestant estates the control over the university of Prague, and authorized them to elect the members of the Utraquist consistory. They were further empowered to elect "defenders" chosen in equal number from the estates of the nobles, knights and citizens, who were to superintend the execution of the enactments of the Letter of Majesty and generally to uphold the rights of the Protestants. On the same day the Romanist and the Protestant members of the diet also signed an agreement by which they guaranteed to each other full liberty of religious worship and declared that this liberty should be extended to all classes of the population.

Matthias.

In 1611 the peace of Bohemia was again disturbed by the invasion of the archduke Leopold of Austria, bishop of Passau, who probably acted in connivance with his cousin King Rudolph. Leopold succeeded in obtaining possession of part of the town of Prague, but his army was defeated by the troops which the Bohemian estates had hurriedly raised, and he was obliged to leave Bohemia. Matthias considered his hereditary rights menaced by the raid of Leopold and again occupied Bohemia. Mainly at his instigation the estates now formally deposed Rudolph, who survived his dethronement only a few months, and died on the 20th of January 1612. Though Matthias had allied himself with the Bohemian Protestants during his prolonged struggle against his brother, he now adopted that policy favourable to the Church of Rome which is traditional of the Habsburg dynasty. His relations with the Bohemian Protestants, therefore, soon became strained. In 1615 Matthias convoked a general diet, *i.e.* one that besides the Bohemian representatives included also the representatives of the "lands of the Bohemian crown." At the meeting of this diet the question of nationality, which through the constant religious controversies had receded to the background, again became predominant. Former enactments enforcing the use of the national language were reaffirmed, and it was decreed that Bohemian should be the "authorized" (*i.e.* official) language of the country.

As Matthias was childless, the question as to the succession to the Bohemian throne again arose. The king wished to secure the succession to his cousin Ferdinand, duke of Styria. Ferdinand was known as a fanatical adherent of the Church of Rome and as a cruel persecutor of the Protestants of Styria. None the less the state officials of Bohemia, by not very scrupulous means, succeeded in persuading the estates to accept Ferdinand as heir to the throne and to consent to his coronation, which took place at Prague on the 17th of June 1617. No doubt through the influence of Ferdinand, the policy of Matthias henceforth assumed a yet more pronouncedly ultramontane character. The king's councillors, all adherents of the Church of Rome, openly expressed their hope that the Catholic Church would soon recover its ancient hold over Bohemia. On the other hand the Bohemian Protestants, led by Count Thurn, one of the few nobles who had refused to vote for the recognition of Ferdinand as heir to the throne, did not wish to defer what they considered an inevitable conflict. It appeared to them more advantageous to encounter the weak Matthias than his younger and more fanatical successor. A comparatively unimportant incident precipitated matters. In December 1617, the archbishop of Prague and the abbot of Břevnov (Braunau) ordered the suppression of the Protestant religious services in churches that had been built on their domains. This was a direct infringement of the agreement concluded by the Romanist and Utraquist estates on the day on which King Rudolph had signed the Letter of Majesty. The defenders took immediate action, by inviting all Protestant members of the diet to meet at Prague. They assembled there on 21st of May 1618, and decided to proceed in full armour to the Hradĉany palace to bring their complaints to the knowledge of the councillors of Matthias. On the following day, Thurn, Wenceslas of Ruppa, Ulrich of Kinsky, and other members of the more advanced party held a secret meeting, at which it was decided to put to death the most influential of Matthias's councillors. On the 23rd the representatives of the Protestants of Bohemia proceeded to the Hradĉany. Violent accusations were brought forward, particularly against Martinic and Slavata, the king's most trusted councillors, who were accused of having advised him to oppose the wishes of the Bohemians. Finally these two councillors, together with Fabricius, secretary of the royal council, were thrown from the windows of the Hradĉany into the moat below—an event known in history as the Defenestration of Prague. Both Martinic and Slavata were but little injured, and succeeded in escaping from Prague. The Bohemians immediately established a provisional government consisting of thirty "directors," ten of whom were chosen by each of the estates. They also proceeded to raise an armed force, the command of which was given to Count Thurn. Hostilities with Austria began in July, when an imperial force entered Bohemia. The troops of Matthias were, however, soon repulsed by the Bohemians, and in November Thurn's army entered Austria, but was soon obliged to retire to Bohemia because of the lateness of the season.

War with the emperor Ferdinand.

In the following March the Bohemian crown became vacant by the death of Matthias. On the 31st of July the Bohemian estates pronounced the formal deposition of Ferdinand, and on the 26th of August they elected as their king Frederick, elector palatine. The new king and his queen, Elizabeth of England, arrived in Bohemia in October, and were crowned somewhat later at St Vitus's cathedral in Prague. Warfare with Austria continued during this year—1619. Thurn occupied Moravia, which now threw in its lot with Bohemia, and he even advanced on Vienna, but was soon obliged to retreat. In the following year events took a fatal turn for Bohemia. The powerful duke Maximilian of Bavaria joined his forces to those of Ferdinand, who had become Matthias's successor as emperor, and who was determined to reconquer Bohemia. Ferdinand also received aid from Spain, Poland and several Italian states. Even the Lutheran elector of Saxony espoused his cause. A large imperialist army, under the command of the duke of Bavaria, Tilly and Bouquoi, entered Bohemia in September 1620. After several skirmishes, in all of which the Bohemians were defeated, the imperial forces arrived at the outskirts of Prague on the evening of the 7th of November. On the following morning they attacked the Bohemian army, which occupied a slightly fortified position on the plateau known as the "Bila Hora" (White Hill). The Bohemians were defeated after a struggle of only a few hours, and on the evening of battle the imperialists already occupied the port of Prague, situated on the left bank of the Vltava (Moldau). King Frederick, who had lost all courage, hurriedly left Prague on the following morning.

Submission of Bohemia.

Bohemia itself, as well as the lands of the Bohemian crown, now submitted to Ferdinand almost without resistance. The battle of the White Hill marks an epoch in the history of Bohemia. The execution of the principal leaders of the national movement (June 21, 1621) was followed by a system of wholesale confiscation of the lands of all who had in any way participated in the national movement. Almost the entire ancient nobility of Bohemia was driven into exile, and adventurers from all countries, mostly men who had served in the imperial army, shared the spoils. Gradually all those who refused to recognize the creed of the Roman church were expelled from Bohemia, and by the use of terrible cruelty Catholicism was entirely re-established in the country. In 1627 Ferdinand published a decree,

which formally suppressed the ancient free constitution of Bohemia, though a semblance of representative government was left to the country. The new constitution proclaimed the heredity of the Bohemian crown in the house of Habsburg. It added a new “estate,” that of the clergy, to the three already existing. This estate, which was to take precedence of all the others, consisted of the Roman archbishop of Prague and of all the ecclesiastics who were endowed with landed estates. The diet was deprived of all legislative power, which was exclusively vested in the sovereign. At its meetings the diet was to discuss such matters only as were laid before it by the representatives of the king. The estates continued to have the right of voting taxes, but they were specially forbidden to attach any conditions to the grants of money which they made to their sovereign. It was finally decreed that the German language should have equal right with the Bohemian one in all the government offices and law-courts of the kingdom. This had indeed become a necessity, since, in consequence of the vast confiscations, the greatest part of the land was in the hands of foreigners to whom the national language was unknown. Though these enactments still left some autonomy to Bohemia, the country gradually lost all individuality. Its history from this moment to the beginning of the 19th century is but a part of the history of Austria (*q.v.*).

Bohemia under Austrian domination.

Bohemia was the theatre of hostilities during a large part of the Thirty Years’ War, which had begun in its capital. In 1631 the Saxons for a time occupied a large part of Bohemia, and even attempted to re-establish Protestantism, During the later period of the Thirty Years’ War Bohemia was frequently pillaged by Swedish troops, and the taking of part of Prague by the Swedish general Königsmark in 1648 was the last event of the great war. The attempts of the Swedish envoys to obtain a certain amount of toleration for the Bohemian Protestants proved fruitless, as the imperial representatives were inflexible on this point. At the beginning of the 18th century the possibility of the extinction of the male line of the house of Habsburg arose. The estates of Bohemia, at a meeting that took place at Prague on the 16th of October 1720, sanctioned the female succession to the Bohemian throne and recognized the so-called Pragmatic Sanction which proclaimed the indivisibility of the Habsburg realm. The archduchess Maria Theresa, in whose favour these enactments were made, none the less met with great opposition on the death of her father the emperor Charles VI. Charles, elector of Bavaria, raised claims to the Bohemian throne and invaded the country with a large army of Bavarian, French and Saxon troops. He occupied Prague, and a large part of the nobles and knights of Bohemia took the oath of allegiance to him (December 19, 1741). The fortune of war, however, changed shortly afterwards. Maria Theresa recovered Bohemia and the other lands that had been under the rule of the house of Habsburg. During the reign of Maria Theresa, and to a greater extent during that of her son Joseph II., many changes in the internal administration of the Habsburg realm took place which all tended to limit yet further the autonomy of Bohemia. A decree of 1749 abolished the separate law-courts that still existed in Bohemia, and a few years later an Austro-Bohemian chancellor was appointed who was to have the control of the administration of Bohemia, as well as of the German domains of the house of Habsburg. The power of the royal officials who constituted the executive government of Bohemia was greatly curtailed, and though the chief representative of the sovereign in Prague continued to bear the ancient title of supreme burgrave, he was instructed to conform in all matters to the orders of the central government of Vienna. Yet more extreme measures tending to centralization were introduced by the emperor Joseph, who refused to be crowned at Prague as king of Bohemia. The powers of the Bohemian diet and of the royal officials at Prague were yet further limited, and the German language was introduced into all the upper schools of Bohemia. Some of the reforms introduced by Joseph were, incidentally and contrary to the wishes of their originator, favourable to the Bohemian nationality. Thus the greater liberty which he granted to the press enabled the Bohemians to publish a newspaper in the national language. After the death of Joseph in 1790 the Bohemian estates, whose meetings had been suspended during his reign, again assembled, but they at first made but scanty attempts to reassert their former rights. During the long Napoleonic wars, in which the house of Habsburg was almost continuously engaged, Bohemia continued in its previous lethargic state. In 1804 a merely formal change in the constitutional position of Bohemia took place when Francis I. assumed the hereditary title of emperor of Austria. It was stated in an imperial decree that the new title of the sovereign should in no way prejudice the ancient rights of Bohemia and that the sovereigns would continue to be crowned as kings of Bohemia.

Revival of national aspirations.

After the re-establishment of European peace in 1815 the long-suppressed national aspirations of Bohemia began to revive. The national movement, however, at first only found expression in the revival of Bohemian literature. The arbitrary and absolutist government of Prince Metternich rendered all political action impossible in the lands ruled by the house of Habsburg. In spite of this pressure the estates of Bohemia began in 1845 to assume an attitude of opposition to the government of Vienna. They affirmed their right of voting the taxes of the country—a right that was due to them according to the constitution of 1627. To obtain the support of the wider classes of the population, they determined in 1847 to propose at their session of the following year that the towns should have a more extensive representation at the diet, that the control of the estates over the finances of the country should be made more stringent, and that the Bohemian language should be introduced into all the higher schools of the country. The revolutionary outbreak of 1848 prevented this meeting of the estates. When the news of the February revolution in Paris reached Prague the excitement there was very great. On the 11th of March a vast public meeting voted a petition to the government of Vienna which demanded that the Bohemian language should enjoy equal rights with the German in all the government offices of the country, that a general diet comprising all the Bohemian lands, but elected on an extensive suffrage, should be convoked, and that numerous liberal reforms should be introduced. The deputation which presented these demands in Vienna received a somewhat equivocal answer. In reply, however, to a second deputation, the emperor Ferdinand declared on the 8th of April that equality of rights would be secured to both nationalities in Bohemia, that the question of the reunion of Moravia and Silesia to Bohemia should be left to a general meeting of representatives of all parts of Austria, and that a new meeting of the estates of Bohemia, which would include representatives of the principal towns, would shortly be convoked. This assembly, which was to have had full powers to create a new constitution, and which would have established complete autonomy, never met, though the election of its members took place on the 17th of May. In consequence of the general national movement which is so characteristic of the year 1848, it was decided to hold at Prague a “Slavic congress” to which Slavs of all parts of the Austrian empire, as well as those belonging to other countries, were invited. The deliberations were interrupted by the serious riots that broke out in the streets of Prague on the 12th of June. They were suppressed after prolonged fighting and

Collapse in 1848.

considerable bloodshed. The Austrian commander, Prince Windischgrätz, bombarded the city, which finally capitulated unconditionally. The nationalist and liberal movement in Bohemia was thus suddenly checked, though the Bohemians took part in the Austrian constituent assembly that met at Vienna, and afterwards at Kroměřiž (Kremsier).

By the end of the year 1849 all constitutional government had ceased in Bohemia, as in all parts of the Habsburg empire. The reaction that now ensued was felt more severely than in any other part of the monarchy; for not only were all attempts to obtain self-government and liberty ruthlessly suppressed, but a determined attempt was made to exterminate the national language. The German language was again exclusively used in all schools and government offices, all Bohemian newspapers were suppressed, and even the society of the Bohemian museum—a society composed of Bohemian noblemen and scholars—was for a time only allowed to hold its meetings under the supervision of the police.

Austrian constitutional changes.

The events of the Italian campaign of 1859 rendered the continuation of absolutism in the Austrian empire impossible. It was attempted to establish a constitutional system which, while maintaining to a certain extent the unity of the empire, should yet recognize the ancient constitutional rights of some of the countries united under the rule of the house of Habsburg. A decree published on the 20th of October 1860 established diets with limited powers. The composition of these parliamentary assemblies was to a certain extent modelled on that of the ancient diets of Bohemia and other parts of the empire. This decree was favourably received in Bohemia, but the hopes which it raised in the country fell when a new imperial decree appeared on the 26th of February 1861. This established a central parliament at Vienna with very extensive powers, and introduced an electoral system which was grossly partial to the Germans. The Bohemians indeed consented to send their representatives to Vienna, but they left the parliament in 1863, stating that the assembly had encroached on the power which constitutionally belonged to the diet of Prague. Two years later the central parliament of Vienna was suspended, and in the following year—1866—the Austro-Prussian war caused a complete change in the constitutional position of Bohemia. The congress of Vienna in 1815 had declared that that country should form part of the newly formed Germanic Confederation; this was done without consulting the estates of the country, as had been customary even after the battle of the White Hill on the occasion of serious constitutional changes. The treaty with Prussia, signed at Prague on the 23rd of August 1866, excluded from Germany all lands ruled by the house of Habsburg. As a natural consequence German influence declined in the Austrian empire, and in Bohemia in particular. While Hungary now obtained complete independence, the new constitution of 1867, which applied only to the German and Slavic parts of the Habsburg empire, maintained the system of centralization and attempted to maintain the waning German influence. The Bohemians energetically opposed this new constitution and refused to send representatives to Vienna.

Renewed struggles of Bohemian nationalism.

In 1871 it appeared probable for a moment that the wishes of the Bohemians, who desired that their ancient constitution should be re-established in a modernized form, would be realized. The new Austrian prime minister, Count Karl Hohenwart, took office with the firm intention of accomplishing an agreement between Bohemia and the other parts of the Habsburg empire. Prolonged negotiations ensued, and an attempt was made to establish a constitutional system which, while satisfying the claims of the Bohemians, would yet have firmly connected them with the other lands ruled by the house of Habsburg. An imperial message addressed to the diet of Prague (September 14, 1871) stated that the sovereign “in consideration of the former constitutional position of Bohemia and remembering the power and glory which its crown had given to his ancestors, and the constant fidelity of its population, gladly recognized the rights of the kingdom of Bohemia, and was willing to confirm this assurance by taking the coronation oath.” Various influences caused the failure of this attempt to reconcile Bohemia with Austria. In 1872 a government with a pronounced German tendency took office in Vienna, and the Bohemians for a time again refused to attend the parliamentary assemblies of Vienna and Prague. In 1879 Count Eduard Taaffe became Austrian prime minister, and he succeeded in persuading the representatives of Bohemia to take part in the deliberations of the parliament of Vienna. They did so, after stating that they took this step without prejudice to their view that Bohemia with Moravia and Silesia constituted a separate state under the rule of the same sovereign as Austria and Hungary. The government of Count Taaffe, in recognition of this concession by the Bohemians, consented to remove some of the grossest anomalies connected with the electoral system of Bohemia, which had hitherto been grossly partial to the German minority of the population. The government of Count Taaffe also consented to the foundation of a Bohemian university at Prague, which greatly contributed to the intellectual development of the country. On the fall of the government of Count Taaffe, Prince Alfred Windischgrätz became prime minister. The policy of his short-lived government was hostile to Bohemia and he was soon replaced by Count Badeni.

The language question.

Badeni again attempted to conciliate Bohemia. He did not indeed consider it feasible to reopen the question of its autonomy, but he endeavoured to remedy some of the most serious grievances of the country. In the beginning of 1897 Count Badeni issued a decree which stated that after a certain date all government officials who wished to be employed in Bohemia would have to prove a certain knowledge of the Bohemian as well as of the German language. This decree met with violent opposition on the part of the German inhabitants of Austria, and caused the fall of Count Badeni’s cabinet at the end of the year 1897. After a brief interval he was succeeded by Count Thun and then by Count Clary, whose government repealed the decrees that had to a certain extent granted equal rights to the Bohemian language. In consequence troubles broke out in Prague, and were severely repressed by the Austrian authorities. During the subsequent ministries of Körber and Gautsch the Bohemians continued to oppose the central government of Vienna, and to assert their national rights.

See generally Count Lützow, *Bohemia, a Historical Sketch* (London, 1896). The valuable collection of historical documents entitled *Fontes Rerum Bohemicarum*, published at Prague in the latter part of the 19th century, has superseded earlier ones such as Freherus (Marquard Freher), *Rerum Bohemicarum Antiqui Scriptores*. Similarly, the earlier historical works of Pubitschka, Pelzl and De Florgy are superseded by Frantisek Palacký’s *Geschichte von Bohmen* (Prague, 1844-1867), which, however, ends with the year 1526. Rezek, Gindely and others have dealt with the history of Bohemia posterior to the year 1526. Professor Adolf Bachmann published (vol. i. in 1899, vol. ii. 1905) a *Geschichte Bohmens* up to 1526, which has a strongly marked German tendency. Of French works Professor Ernest Denis’s *Jean Hus, et la guerre des Hussites* (Paris, 1878), *Fin de l’independance bohème* (2 vols., 1890), and *La Bohême depuis la Montagne Blanche* (2 vols.,

1903), give a continuous account of Bohemian history from the beginning of the 15th century.

(L.)

Literature

The earliest records of the Bohemian or Czech language are very ancient, though the so-called MSS. of Zelena Hora (Grüneberg) and Kralodvur (Königinhof) are almost certainly forgeries of the early part of the 19th century. The earliest genuine documents of the Bohemian language comprise several hymns and legends; of the latter the legend of St Catherine and that of St Dorothy have the greatest value. Several ancient epic fragments have also been preserved, such as the *Alexandreis* and *Tandarias a Floribella*. These and other early Bohemian writings have been printed since the revival of Bohemian literature in the 19th century. Of considerable historical value is the rhymed chronicle generally though wrongly known as the chronicle of Dalimil. The author, who probably lived during the reign of King John (1310-1346), records the events of Bohemian history from the earliest period to the reign of King Henry of Carinthia, the immediate predecessor of John. A strong feeling of racial antipathy to the Germans pervades the chronicle.

Old Czech literature.

It is undoubtedly to be attributed to the high intellectual level which Bohemia attained in the 14th century that at that period we already find writers on religious and philosophical subjects who used the national language. Of these the most important is Thomas of Štitný (*c.* 1331-1401). Of his works, which contain many ideas similar to those of his contemporary Wycliffe, those entitled *O obecnych vecech Krestanskych* (on general Christian matters) and *Besedni reči* (in a rough translation "learned entertainments") have most value. Štitný and some of his contemporaries whose Bohemian writings have perished are known as the forerunners of Huss. Huss, like many of his contemporaries in Bohemia, wrote both in Bohemian and in Latin. Of the Bohemian writings of Huss, who contributed greatly to the development of his native language, the most important is his *Výklad viry, desatera Boziho prikazani, a patere* (exposition of the creed, the ten commandments and the Lord's Prayer) written in 1412. Of his numerous other Bohemian works we may mention the *Postilla* (collection of sermons), the treatises *O poznani cesty prave k spaseni* (the true road to salvation) and *O svatokupectvi* (on simony), and a large collection of letters; those written in prison are very touching.

The years that followed the death of Huss formed in Bohemia a period of incessant theological strife. The anti-Roman or Hussite movement was largely a democratic one, and it is therefore natural that the national language rather than Latin should have been used in the writings that belong to this period. Unfortunately in consequence of the systematic destruction of all Bohemian writings which took place through the agency of the Jesuits, after the battle of the White Hill (1620), a large part of this controversial literature has perished. Thus the writings of the members of the extreme Hussite party, the so-called Taborites, have been entirely destroyed. Of the writings of the more moderate Hussites, known as the Calixtines or Utraquists, some have been preserved. Such are the books entitled *Of the Great Torment of the Holy Church* and the *Lives of the Priests of Tabor*, written in a sense violently hostile to that community. A Bohemian work by Archbishop John of Rokycan has also been preserved; it is entitled *Postilla* and is similar though inferior to the work of Huss that bears the same name.

A quite independent religious writer who belongs to the period of the Hussite wars is Peter Chelcicky (born in the last years of the 14th century, died 1460), who may be called the Tolstoy of the 15th. His dominant ideas were horror of bloodshed and the determination to accept unresistingly all, even unjust, decrees of the worldly authorities. Though a strenuous enemy of the Church of Rome, Chelcicky joined none of the Hussite parties. His masterpiece is the *Sít viry* (the net of faith). Among his other works his *Postilla* and polemical writings in the form of letters to Archbishop John of Rokycan and Bishop Nicolas of Pelhrimov deserve mention.

The Hussite period is rather poor in historical works written in the language of the country. We should, however, mention some chroniclers who were contemporaries and sometimes eye-witnesses of the events of the Hussite wars. Their writings have been collected and published by Frantisek Palacký under the title of *Stare českе letopisy*.

In the 16th century when Bohemia was in a state of comparative tranquillity, the native literature was largely developed. Besides the writers of the community of the Bohemian Brethren, we meet at this period with three historians of merit. Of these far the best-known is Wenceslas Hajek of Libočan. The year of his birth is uncertain, but we read of him as a priest in 1524; he died in 1553. His great work *Kronika česka* was dedicated to the emperor Ferdinand I., king of Bohemia, and appeared under the auspices of government officials. It has therefore a strong dynastic and Romanist tendency, and its circulation was permitted even at the time when most Bohemian books were prohibited and many totally destroyed. Hajek's book was translated into several languages and frequently quoted. We find such second-hand quotations even in the works of many writers who had probably never heard of Hajek. His book is, however, inaccurate and grossly partial. Very little known on the other hand are the works of Bartoš, surnamed "pisár" (the writer), as he was for many years employed as secretary by the city of Prague, and those of Sixt of Ottersdorf. The work of Bartoš (or Bartholomew) entitled the *Chronicle of Prague* has great historical value. He describes the troubles that befell Prague and Bohemia generally during the reign of the weak and absentee sovereign King Louis. The year of the birth of Bartos is uncertain, but it is known that he died in 1539. The somewhat later work of Sixt of Ottersdorf (1500-1583) deals with a short but very important episode in the history of Bohemia. It is entitled *Memorials of the Troubled Years 1546 and 1547*. The book describes the unsuccessful rising of the Bohemians against Ferdinand I. of Austria. Sixt took a considerable part in this movement, a fact that greatly enhances the value of his book.

Though the life of Chelĉicky, who has already been mentioned, was an isolated one, he is undoubtedly the indirect founder of the community of the "Bohemian Brethren," who greatly influenced Bohemian literature. Almost all their historical and theological works were written in the national language, which through their influence became far more refined and polished. Before referring to some of the writings of members of the community we should mention the famed translation of the Scriptures known as the *Bible of Kralice*. It was the joint work of several divines of the brotherhood, and was first printed at Kralice in Moravia in 1593. Brother Gregory, surnamed the patriarch of the brotherhood, has left a large number of writings dealing mainly with theological matters. Most important are the *Letters to Archbishop Rokycan* and the book *On good and evil*

priests. After the death of Brother Gregory in 1480 discord broke out in the community, and it resulted in very great literary activity. Brothers Lucas, Blahoslav and Jaffet, as well as Augusta, a bishop of the community, have left us numerous controversial works. Very interesting is the account of the captivity of Bishop Augusta, written by his companion the young priest Jan Bilek. We have evidence that numerous historical works written by members of the brotherhood existed, but most of them perished in the 17th century when nearly all anti-Roman books written in Bohemia were destroyed. Thus only fragments of Blahoslav's *History of the Unity* (*i.e.* the brotherhood) have been preserved. One of the historians of the brotherhood, Wenceslas Brezan, wrote a *History of the House of Rosenberg*, of which only the biographies of William and Peter of Rosenberg have been preserved. The greatest writer of the brotherhood is John Amos Komensky or Comenius (1592-1670). Of his many works written in his native language the most important is his *Labyrinth of the World*, an allegorical tale which is perhaps the most famous work written in Bohemian.[4] Many of the numerous devotional and educational writings of Comenius,—his works number 142,—are also written in his native tongue.

The year 1620, which witnessed the downfall of Bohemian independence, also marks the beginning of a period of decline of the national tongue, which indeed later, in the 18th century, was almost extinct as a written language. Yet we must notice besides Comenius two other writers, both historians, whose works belong to a date later than 1620. Of these one was an adherent of the nationalist, the other of the imperialist party. Paul Skála ze Zhoře (1582-c. 1640) was an official in the service of the "winter king" Frederick of the Palatinate. He for a time followed his sovereign into exile, and spent the last years of his life at Freiberg in Saxony. It was at this period of his life, after his political activity had ceased, that he wrote his historical works. His first work was a short book which is a mere series of chronological tables. Somewhat later he undertook a vast work entitled *Histoire cirkevni* (history of the church). In spite of its title the book, which consists of ten enormous MS. volumes, deals as much with political as with ecclesiastical matters. The most valuable part, that dealing with events of 1602 to 1623, of which Skála writes as a contemporary and often as an eye-witness, has been edited and published by Prof. Tieftrunk. A contemporary and a political opponent of Skála was William Count Slavata (1572-1652). He was a faithful servant of the house of Habsburg, and one of the government officials who were thrown from the windows of the Hradĉany palace in 1618, at the beginning of the Bohemian uprising. In 1637 Slavata published his *Pamety* (memoirs) which deal exclusively with the events of the years 1618 and 1619, in which he had played so great a part. During the leisure of the last years of his long life Slavata composed a vast work entitled *Historické Spisovani* (historical works). It consists of fourteen large MS. volumes, two of which contain the previously-written memoirs. These two volumes have recently been edited and published by Dr Jos. Jiřecek.

After the deaths of Skála, Slavata and Comenius, no works of any importance were written in the Bohemian language for a considerable period, and the new Austrian government endeavoured in every way to discourage the use of that language. A change took place when the romantic movement started at the beginning of the 19th century. The early revival of the Bohemian language was very modest, and at first almost exclusively translations from foreign languages were published. The first writer who again drew attention to the then almost forgotten Bohemian language was Joseph Dobrovský (1753-1829). His works, which include a grammar of the Bohemian language and a history of Bohemian literature, were mostly written in German or Latin, and his only Bohemian works are some essays which he contributed to the early numbers of the *Časopis Musea Království CČeského* (Journal of the Bohemian Museum) and a collection of letters.

19th-century revival.

It is, however, to four men belonging to a time somewhat subsequent to that of Dobrovský that the revival of the language and literature of Bohemia is mainly due. They are Jungmann, Kolar, Šafařik and Palacký. Joseph Jungmann (1773-1847) published early in life numerous Bohemian translations of German and English writers. His most important works are his *Dejepes literatury česka* (history of Bohemian literature), and his monumental German and Bohemian dictionary, which largely contributed to the development of the Bohemian language. John Kolar (1793-1852) was the greatest poet of the Bohemian revival, and it is only in quite recent days that Bohemian poetry has risen to a higher level. Kolar's principal poem is the *Slavy dcera* (daughter of Slavia), a personification of the Slavic race. Its principal importance at the present time consists rather in the part it played in the revival of Bohemian literature than in its artistic value. Kolar's other works are mostly philological studies. Paul Joseph Šafařik (1795-1861) was a very fruitful writer. His *Starožitnosti Slovanské* (Slavic antiquities), an attempt to record the then almost unknown history and literature of the early Slavs, has still considerable value. Francis Palacký (1798-1876) is undoubtedly the greatest of Bohemian historians. Among his many works his history of Bohemia from the earliest period to the year 1526 is the most important.

Other Bohemian writers whose work belongs mainly to the earlier part of the 19th century are the poets Francis Ladislav Čelakovský, author of the *Růže stolistova* (the hundred-leaved rose), Erben, Macha, Tyl, to mention but a few of the most famous writers. The talented writer Karel Havlicek, the founder of Bohemian journalism, deserves special notice.

During the latter part of the 19th century, and particularly after the foundation of the national university in 1882, Bohemian literature has developed to an extent that few perhaps foresaw. Of older writers Božena Němceva, whose *Babička* has been translated into many languages, and Benes Trebizky, author of many historical novels, should be named. John Neruda (1834-1891) was a very fruitful and talented writer both of poetry and of prose. Perhaps the most valuable of his many works is his philosophical epic entitled *Kosmicke basne* (cosmic poems). Julius Zeyer (1841-1901) also wrote much both in prose and in verse. His epic poem entitled *Vysehrad*, which celebrates the ancient glory of the acropolis of Prague, has great value, and of his many novels *Jan Maria Plojhar* has had the greatest success. Of later Bohemian poets the best are Adolf Heyduk, Svatopluk Čech and Jaroslav Vrchlický (b. 1853). Of Svatopluk Cech's many poems, which are all inspired by national enthusiasm, *Václav z Michalovic, Lesetinsky Kovar* (the smith of Lesetin) and *Basne otroka* (the songs of a slave) are the most notable. While Vrchlický (pseudonym of Emil Frida) has no less strong patriotic feelings, he has been more catholic in the choice of the subjects of his many works, both in poetry and in prose. Of his many collections of lyric poems *Rok na jihu* (a year in the south), *Poute k Eldoradu* (pilgrimages to Eldorado) and *Sonety Samotare* (sonnets of a recluse) have particular value. Vrchlický is also a very brilliant dramatist. Bohemian novelists have become very numerous. Mention should be made of Alois Jirásek, also a distinguished dramatic author; Jacob Arbes, whose *Romanetta* have great merit; and Václav Hladík, whose *Evzen Voldan* is a very striking representation of the life of modern Prague. Like so many Bohemian authors,

Hladík also is a copious dramatic author.

Bohemia has been very fruitful in historic writers. Wenceslas Tomek (1818-1905) left many historical works, of which his *Dějepis města Prahy* (history of the town of Prague) is the most important. Jaroslav Goll (b. 1846) is the author of many historical works, especially on the community of the Bohemian Brethren. Professor Joseph Kalousek has written much on the early history of Bohemia, and is also the author of a very valuable study of the ancient constitution (*Statni pravo*) of Bohemia. Dr Anton Rezek is the author of important historical studies, many of which appeared in the Journal of the Bohemian Museum and in the *Česky Časopis Historický* (Bohemian Historical Review), which he founded in 1895 jointly with Professor Jaroslav Goll. More recently Dr Václav Flajshans has published some excellent studies on the life and writings of John Huss, and Professors Pic and Niederle have published learned archaeological studies on the earliest period of Bohemian history.

See Count Lützow, *A History of Bohemian Literature* (London, 1899); W.R. Morfill, *Slavonic Literature* (1883); A.N. Pypin and V.D. Spasovič, *History of Slavonic Literature* (written in Russian, translated into German by Trangott Pech, *Gesch. der slav. Literaturen*, 2 vols., Leipzig, 1880-1884). There are modern histories of Bohemian literature written in the national language by Dr Karel Tieftrunk, Dr Václav Flajšhans and Mr Jaroslav Vlaek.

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1 As a guide to the English-speaking reader, the following notes on the pronunciation of Bohemian names are appended. The Czech (Čech) alphabet is the same as the English, with the omission of the letters q, w and x. Certain letters, however, vary in pronunciation, and are distinguished by diacritical marks, a device orginated by John Huss. The vowels a, e, i, (y), o, u, are pronounced as in Italian; but ě = Eng. yě in "yet," and ů = Eng. oo.

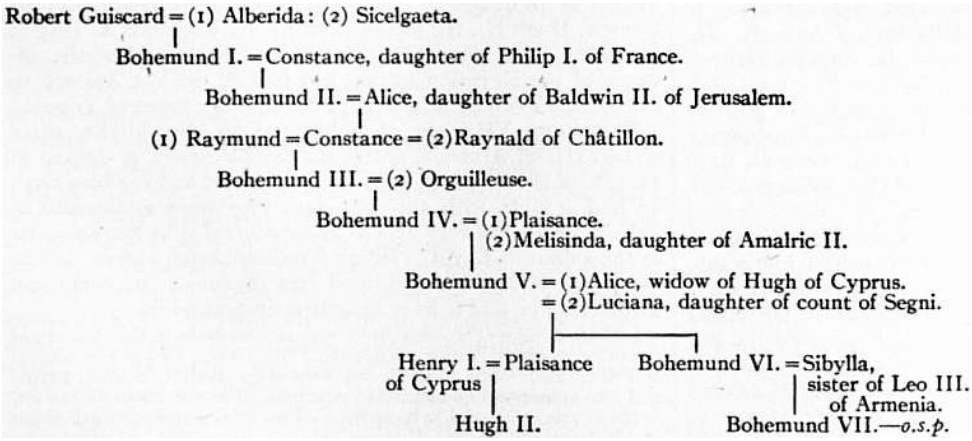
The consonants, b, d, f, k, l, m, n, p, r, v, z, are as in English; g = Eng. g in "gone"; s = Eng. initial s. But ň = Span. ñ (in *cañon*); ř = rsh; š = sh; ž = zh (*i.e.* the French j); k before d = g; v before k, p, s, t = f. Of the other consonants c = Eng. ts; č = ch; ch = Germ. ch; j = Eng. y, but is not pronounced before d, m, s. Accents on vowels lengthen them; on d and t they are softening marks. H is always pronounced in Czech. At the end of words and before k and t it = Germ, ch; in other places, as in *bahno* (morass) its pronunciation is somewhat softer.

2 *Protestatio Bohemorum*, frequently printed in English and German, as well as in the Latin original.

3 Laurence of Brezova's (contemporary) *Kronika Husitská*.

4 This work has been translated into English by Count Lützow for the "Temple Classics."

BOHEMUND, the name of a series of princes of Antioch, afterwards counts of Tripoli. Their connexion is shown in the following table:—



Bohemund I. (*c.* A.D. 1058-1111), prince of Otranto and afterwards of Antioch, whose first name was Marc, was the eldest son of Robert Guiscard, *dux Apuliae et Calabriae*, by an early marriage contracted before 1059. He served under his father in the great attack on the East Roman empire (1080-1085), and commanded the Normans during Guiscard's absence (1082-1084), penetrating into Thessaly as far as Larissa, but being repulsed by Alexius Comnenus. This early hostility to Alexius had a great influence in determining the course of his future career, and thereby helped to determine the history of the First Crusade, of which Bohemund may be regarded as the leader. On the death of Guiscard in 1085, his younger son Roger, born "in the purple" of a Lombard princess Sicelgaeta, succeeded to the duchy of Apulia and Calabria, and a war arose between Bohemund (whom his father had destined for the throne of Constantinople) and Duke Roger. The war was finally composed by the mediation of Urban II. and the award of Otranto and other possessions to Bohemund. In 1096 Bohemund, along with his uncle the great count of Sicily, was attacking Amalfi, which had revolted against Duke Roger, when bands of crusaders began to pass, on their way through Italy to Constantinople. The zeal of the crusader came upon Bohemund: it is possible, too, that he saw in the First Crusade a chance of realizing his father's policy (which was also an old Norse instinct) of the *Drang nach Osten*, and hoped from the first to carve for himself an eastern principality. He gathered a fine Norman army (perhaps the finest division in the crusading host), at the head of which he crossed the Adriatic, and penetrated to Constantinople along the route he had tried to follow in 1082-1084. He was careful to observe a "correct" attitude towards Alexius, and when he arrived at Constantinople in April 1097 he did homage to the emperor. He may have negotiated with Alexius about a principality at Antioch; if he did so, he had little encouragement. From Constantinople to Antioch Bohemund was the real leader of the First Crusade; and it says much for his leading that the First Crusade succeeded in crossing Asia Minor, which the Crusades of 1101, 1147 and 1189 failed to accomplish. A

politique, Bohemund was resolved to engineer the enthusiasm of the crusaders to his own ends; and when his nephew Tancred left the main army at Heraclea, and attempted to establish a footing in Cilicia, the movement may have been already intended as a preparation for Bohemund's eastern principality. Bohemund was the first to get into position before Antioch (October 1097), and he took a great part in the siege, beating off the Mahommedan attempts at relief from the east, and connecting the besiegers on the west with the port of St Simeon and the Italian ships which lay there. The capture of Antioch was due to his connexion with Firuz, one of the commanders in the city; but he would not bring matters to an issue until the possession of the city was assured him (May 1098), under the terror of the approach of Kerbogha with a great army of relief, and with a reservation in favour of Alexius, if Alexius should fulfil his promise to aid the crusaders. But Bohemund was not secure in the possession of Antioch, even after its surrender and the defeat of Kerbogha; he had to make good his claims against Raymund of Toulouse, who championed the rights of Alexius. He obtained full possession in January 1099, and stayed in the neighbourhood of Antioch to secure his position, while the other crusaders moved southward to the capture of Jerusalem. He came to Jerusalem at Christmas 1099, and had Dagobert of Pisa elected as patriarch, perhaps in order to check the growth of a strong Lotharingian power in the city. It might seem in 1100 that Bohemund was destined to found a great principality in Antioch, which would dwarf Jerusalem; he had a fine territory, a good strategical position and a strong army. But he had to face two great forces—the East Roman empire, which claimed the whole of his territories and was supported in its claim by Raymund of Toulouse, and the strong Mahommedan principalities in the north-east of Syria. Against these two forces he failed. In 1100 he was captured by Danishmend of Sivas, and he languished in prison till 1103. Tancred took his place; but meanwhile Raymund established himself with the aid of Alexius in Tripoli, and was able to check the expansion of Antioch to the south. Ransomed in 1103 by the generosity of an Armenian prince, Bohemund made it his first object to attack the neighbouring Mahommedan powers in order to gain supplies. But in heading an attack on Harran, in 1104, he was severely defeated at Balich, near Rakka on the Euphrates. The defeat was decisive; it made impossible the great eastern principality which Bohemund had contemplated. It was followed by a Greek attack on Cilicia; and despairing of his own resources, Bohemund returned to Europe for reinforcements in order to defend his position. His attractive personality won him the hand of Constance, the daughter of the French king, Philip I., and he collected a large army. Dazzled by his success, he resolved to use his army not to defend Antioch against the Greeks, but to attack Alexius. He did so; but Alexius, aided by the Venetians, proved too strong, and Bohemund had to submit to a humiliating peace (1108), by which he became the vassal of Alexius, consented to receive his pay, with the title of *Sebastos*, and promised to cede disputed territories and to admit a Greek patriarch into Antioch. Henceforth Bohemund was a broken man. He died without returning to the East, and was buried at Canossa in Apulia, in 1111.

LITERATURE.—The anonymous *Gesta Francorum* (edited by H. Hagenmeyer) is written by one of Bohemund's followers; and the *Alexiad* of Anna Comnena is a primary authority for the whole of his life. His career is discussed by B. von Kügler, *Bohemund und Tancred* (Tübingen, 1862); while L. von Heinemann, *Geschichte der Normannen in Sicilien und Unteritalien* (Leipzig, 1894), and R. Röhricht, *Geschichte des ersten Kreuzzuges* (Innsbruck, 1901), and *Geschichte des Königreichs Jerusalem* (Innsbruck, 1898), may also be consulted for his history.

BOHEMUND II. (1108-1131), son of the great Bohemund by his marriage with Constance of France, was born in 1108, the year of his father's defeat at Durazzo. In 1126 he came from Apulia to Antioch (which, since the fall of Roger, the successor of Tancred, in 1119, had been under the regency of Baldwin II.); and in 1127 he married Alice, the younger daughter of Baldwin. After some trouble with Joscelin of Edessa, and after joining with Baldwin II. in an attack on Damascus (1127), he was defeated and slain on his northern frontier by a Mahommedan army from Aleppo (1131). He had shown that he had his father's courage: if time had sufficed, he might have shown that he had the other qualities of the first Bohemund.

BOHEMUND III. was the son of Constance, daughter of Bohemund II., by her first husband, Raymund of Antioch. He succeeded his mother in the principality of Antioch in 1163, and first appears prominently in 1164, as regent of the kingdom of Jerusalem during the expedition of Amalric I. to Egypt. During the absence of Amalric, he was defeated and captured by Nureddin (August 1164) at Harenc, to the east of Antioch. He was at once ransomed by his brother-in-law, the emperor Manuel, and went to Constantinople, whence he returned with a Greek patriarch. In 1180 he deserted his second wife, the princess Orguilleuse, for a certain Sibylla, and he was in consequence excommunicated. By Orguilleuse he had had two sons, Raymund and Bohemund (the future Bohemund IV.), whose relations and actions determined the rest of his life. Raymund married Alice, a daughter of the Armenian prince Rhupen (Rupin), brother of Leo of Armenia, and died in 1197, leaving behind him a son, Raymund Rhupen. Bohemund, the younger brother of Raymund, had succeeded the last count of Tripoli in the possession of that county, 1187; and the problem which occupied the last years of Bohemund III. was to determine whether his grandson, Raymund Rhupen, or his younger son, Bohemund, should succeed him in Antioch. Leo of Armenia was naturally the champion of his great-nephew, Raymund Rhupen; indeed he had already claimed Antioch in his own right, before the marriage of his niece to Raymund, in 1194, when he had captured Bohemund III. at Gastin, and attempted without success to force him to cede Antioch.[1] Bohemund the younger, however, prosecuted his claim with vigour, and even evicted his father from Antioch about 1199: but he was ousted by Leo (now king of Armenia by the grace of the emperor, Henry VI.), and Bohemund III. died in possession of his principality (1201).

BOHEMUND IV., younger son of Bohemund III. by his second wife Orguilleuse, became count of Tripoli in 1187, and succeeded his father in the principality of Antioch, to the exclusion of Raymund Rhupen, in 1201. But the dispute lasted for many years (Leo of Armenia continuing to champion the cause of his great-nephew), and long occupied the attention of Innocent III. Bohemund IV. enjoyed the support of the Templars (who, like the Knights of St John, had estates in Tripoli) and of the Greek inhabitants of Antioch, to whom he granted their own patriarch in 1207, while Leo appealed (1210-1211) both to Innocent III. and the emperor Otto IV., and was supported by the Hospitallers. In 1216 Leo captured Antioch, and established Raymund Rhupen as its prince; but he lost it again in less than four years, and it was once more in the possession of Bohemund IV. when Leo died in 1220. Raymund Rhupen died in 1221; and after the event Bohemund reigned in Antioch and Tripoli till his death, proving himself a determined enemy of the Hospitallers, and thereby incurring excommunication in 1230. He first joined, and then deserted, the emperor Frederick II., during the crusade of 1228-29; and he was excluded from the operation of the treaty of 1229. When he died in 1233, he had just concluded peace with the Hospitallers, and Gregory IX. had released him from the excommunication of 1230.

Bohemund V., son of Bohemund IV. by his wife Plaisance (daughter of Hugh of Gibelet), succeeded his father in 1233. He was prince of Antioch and count of Tripoli, like his father; and like him he enjoyed the alliance of the Templars and experienced the hostility of Armenia, which was not appeased till 1251, when the mediation of St Louis, and the marriage of the future Bohemund VI. to the sister of the Armenian king, finally brought peace. By his first marriage in 1225 with Alice, the widow of Hugh I. of Cyprus, Bohemund V. connected the history of Antioch for a time with that of Cyprus. He died in 1251. He had resided chiefly at Tripoli, and under him Antioch was left to be governed by its bailiff and commune.

Bohemund VI. was the son of Bohemund V. by Luciana, a daughter of the count of Segni, nephew of Innocent III. Born in 1237, Bohemund VI. succeeded his father in 1251, and was knighted by St Louis in 1252. His sister Plaisance had married in 1250 Henry I. of Cyprus, the son of Hugh I.; and the Cypriot connexion of Antioch, originally formed by the marriage of Bohemund V. and Alice, the widow of Hugh I., was thus maintained. In 1252 Bohemund VI. established himself in Antioch, leaving Tripoli to itself, and in 1257 he procured the recognition of his nephew, Hugh II., the son of Henry I. by Plaisance, as king of Jerusalem. He allied himself to the Mongols against the advance of the Egyptian sultan; but in 1268 he lost Antioch to Bibars, and when he died in 1275 he was only count of Tripoli.

Bohemund VII., son of Bohemund VI. by Sibylla, sister of Leo III. of Armenia, succeeded to the county of Tripoli in 1275, with his mother as regent. In his short and troubled reign he had trouble with the Templars who were established in Tripoli; and in the very year of his death (1287) he lost Laodicea to the sultan of Egypt. He died without issue; and as, within two years of his death, Tripoli was captured, the county of Tripoli may be said to have become extinct with him.

Literature.—The history of the Bohemunds is the history of the principality of Antioch, and, after Bohemund IV., of the county of Tripoli also. For Antioch, we possess its *Assises* (Venice, 1876); and two articles on its history have appeared in the *Revue de l'Orient Latin* (Paris, 1893, fol.), both by E. Rey ("Resumé chronologique de l'histpire des princes d'Antioche," vol. iv., and "Les dignitaires de la principauté d'Antioche," vol. viii.). R. Röhricht, *Geschichte des Königreichs Jerusalem* (Innsbruck, 1898), gives practically all that is known about the history of Antioch and Tripoli.

(E. Br.)

1 During the captivity of Bohemund III. the patriarch of Antioch helped to found a commune, which persisted, with its mayor and *jurats*, during the 13th century.

BÖHMER, JOHANN FRIEDRICH (1795-1863), German historian, son of Karl Ludwig Böhmer (d. 1817), was born at Frankfort-on-Main on the 22nd of April 1795. Educated at the universities of Heidelberg and Göttingen, he showed an interest in art and visited Italy; but returning to Frankfort he turned his attention to the study of history, and became secretary of the *Gesellschaft für ältere deutsche Geschichtskunde*. He was also archivist and then librarian of the city of Frankfort. Böhmer had a great dislike of Prussia and the Protestant faith, and a corresponding affection for Austria and the Roman Catholic Church, to which, however, he did not belong. His critical sense was, perhaps, somewhat warped; but his researches are of great value to students. He died unmarried, at Frankfort, on the 22nd of October 1863. Böhmer's historical work was chiefly concerned with collecting and tabulating charters and other imperial documents of the middle ages. First appeared an abstract, the *Regesta chronologico-diplomatica regum atque imperatorum Romanorum 911-1313* (Frankfort, 1831), which was followed by the *Regesta chronologico-diplomatica Karolorum. Die Urkunden sämtlicher Karolinger in kurzen Auszügen* (Frankfort, 1833), and a series of *Regesta imperii*. For the period 1314-1347 (Frankfort, 1839) the *Regesta* was followed by three, and for the period 1246-1313 (Frankfort, 1844) by two supplementary volumes. The remaining period of the *Regesta*, as edited by Böhmer, is 1198-1254 (Stuttgart, 1849). These collections contain introductions and explanatory passages by the author. Very valuable also is the *Fontes rerum Germanicarum* (Stuttgart, 1843-1868), a collection of original authorities for German history during the 13th and 14th centuries. The fourth and last volume of this work was edited by A. Huber after the author's death. Other collections edited by Böhmer are: *Die Reichsgesetze 900-1400* (Frankfort, 1832); *Wittelsbachische Regesten von der Erwerbung des Herzogtums Bayern bis zu 1340* (Stuttgart, 1854); and *Codex diplomaticus Moeno-Francofurtanus. Urkundenbuch der Reichsstadt Frankfurt* (Frankfort, 1836; new edition by F. Law, 1901). Other volumes and editions of the *Regesta imperii*, edited by J. Ficker, E. Mühlbacher, E. Winkelmann and others, are largely based on Böhmer's work. Böhmer left a great amount of unpublished material, and after his death two other works were published from his papers: *Acta imperii selecta*, edited by J. Ficker (Innsbruck, 1870); and *Regesta archiepiscoporum Maguntinensium*, edited by C. Will (Innsbruck, 1877-1886).

See J. Janssen, *J.F. Böhmers Leben, Briefe und kleinere Schriften* (Freiburg, 1868).

BOHN, HENRY GEORGE (1796-1884), British publisher, son of a German bookbinder settled in England, was born in London on the 4th of January 1796. In 1831 he started as a dealer in rare books and "remainders." In 1841 he issued his "Guinea" Catalogue of books, a monumental work containing 23,208 items. Bohn was noted for his book auction sales: one held in 1848 lasted four days, the catalogue comprising twenty folio pages. Printed on this catalogue was the information: "Dinner at 2 o'clock, dessert at 4, tea at 5, and supper at 10." The name of Bohn is principally remembered by the important *Libraries* which he inaugurated: these were begun in 1846 and comprised editions of standard works and translations, dealing with history, science, classics, theology and archaeology, consisting in all of 766 volumes. One of Bohn's most useful and laborious undertakings was his revision (6 vols. 1864) of *The Bibliographer's Manual of English Literature* (1834) of W.T.

Lowndes. The plan includes bibliographical and critical notices, particulars of prices, &c., and a considerable addition to the original work. It had been one of Bohn's ambitions to found a great publishing house, but, finding that his sons had no taste for the trade, he sold the *Libraries* in 1864 to Messrs. Bell and Daldy, afterwards G. Bell & Sons. Bohn was a man of wide culture and many interests. He himself made considerable contributions to his *Libraries*: he collected pictures, china and ivories, and was a famous rose-grower. He died at Twickenham on the 22nd of August 1884.

BÖHTLINGK, OTTO VON (1815-1004) German Sanskrit scholar, was born on the 30th of May (11th of June O.S.) 1815 at St Petersburg. Having studied (1833-1835) Oriental languages, particularly Arabic, Persian and Sanskrit, at the university of St Petersburg, he continued his studies in Germany, first in Berlin and then (1839-1842) in Bonn. Returning to St Petersburg in 1842, he was attached to the Royal Academy of Sciences, and was elected an ordinary member of that society in 1855. In 1860 he was made "Russian state councillor," and later "privy councillor" with a title of nobility. In 1868 he settled at Jena, and in 1885 removed to Leipzig, where he resided until his death there on the 1st of April 1904. Böhtlingk was one of the most distinguished scholars of the 19th century, and his works are of pre-eminent value in the field of Indian and comparative philology. His first great work was an edition of Panini's *Acht Bücher grammatischer Regeln* (Bonn, 1839-1840), which was in reality a criticism of Franz Bopp's philological methods. This book Böhtlingk again took up forty-seven years later, when he republished it with a complete translation under the title *Paninis Grammatik mit Übersetzung* (Leipzig, 1887). The earlier edition was followed by *Vopadevas Grammatik* (St Petersburg, 1847); *Über die Sprache der Jakuten* (St Petersburg, 1851); *Indische Spruche* (2nd ed. in 3 parts, St Petersburg, 1870-1873, to which an index was published by Blau, Leipzig, 1893); a critical examination and translation of *Chhandogya-upanishad (St Petersburg, 1889) and a translation of Brihadaranyaka-upanishad* (St Petersburg, 1889). In addition to these he published several smaller treatises, notably one on the Sanskrit accents, *Über den Accent im Sanskrit* (1843). But his *magnum opus* is his great Sanskrit dictionary, *Sanskrit-Wörterbuch* (7 vols., St Petersburg, 1853-1875; new ed. 7 vols., St Petersburg, 1879-1889), which with the assistance of his two friends, Rudolf Roth (1821-1895) and Albrecht Weber (b. 1825), was completed in twenty-three years.

BOHUN, the name of a family which plays an important part in English history during the 13th and 14th centuries; it was taken from a village situated in the Cotentin between Coutances and the estuary of the Vire. The Bohuns came into England at, or shortly after, the Norman Conquest; but their early history there is obscure. The founder of their greatness was Humphrey III., who in the latter years of Henry I., makes his appearance as a *dapifer*, or steward, in the royal household. He married the daughter of Milo of Gloucester, and played an ambiguous part in Stephen's reign, siding at first with the king and afterwards with the empress. Humphrey III. lived until 1187, but his history is uneventful. He remained loyal to Henry II. through all changes, and fought in 1173 at Farnham against the rebels of East Anglia. Outliving his eldest son, Humphrey IV., he was succeeded in the family estates by his grandson Henry. Henry was connected with the royal house of Scotland through his mother Margaret, a sister of William the Lion; an alliance which no doubt assisted him to obtain the earldom of Hereford from John (1199). The lands of the family lay chiefly on the Welsh Marches, and from this date the Bohuns take a foremost place among the Marcher barons. Henry de Bohun figures with the earls of Clare and Gloucester among the twenty-five barons who were elected by their fellows to enforce the terms of the Great Charter. In the subsequent civil war he fought on the side of Louis, and was captured at the battle of Lincoln (1217). He took the cross in the same year and died on his pilgrimage (June 1, 1220). Humphrey V., his son and heir, returned to the path of loyalty, and was permitted, some time before 1239, to inherit the earldom of Essex from his maternal uncle, William de Mandeville. But in 1258 this Humphrey fell away, like his father, from the royal to the baronial cause. He served as a nominee of the opposition on the committee of twenty-four which was appointed, in the Oxford parliament of that year, to reform the administration. It was only the alliance of Montfort with Llewelyn of North Wales that brought the earl of Hereford back to his allegiance. Humphrey V. headed the first secession of the Welsh Marchers from the party of the opposition (1263), and was amongst the captives whom the Montfortians took at Lewes. The earl's son and namesake was on the victorious side, and shared in the defeat of Evesham, which he did not long survive. Humphrey V. was, therefore, naturally selected as one of the twelve arbitrators to draw up the ban of Kenilworth (1266), by which the disinherited rebels were allowed to make their peace. Dying in 1275, he was succeeded by his grandson Humphrey VII. This Bohun lives in history as one of the recalcitrant barons of the year 1297, who extorted from Edward I. the *Confirmatio Cartarum*. The motives of the earl's defiance were not altogether disinterested. He had suffered twice from the chicanery of Edward's lawyers; in 1284 when a dispute between himself and the royal favourite, John Giffard, was decided in the latter's favour; and again in 1292 when he was punished with temporary imprisonment and sequestration for a technical, and apparently unwitting, contempt of the king's court. In company, therefore, with the earl of Norfolk he refused to render foreign service in Gascony, on the plea that they were only bound to serve with the king, who was himself bound for Flanders. Their attitude brought to a head the general discontent which Edward had excited by his arbitrary taxation; and Edward was obliged to make a surrender on all the subjects of complaint. At Falkirk (1298) Humphrey VII. redeemed his character for loyalty. His son, Humphrey VIII., who succeeded him in the same year, was allowed to marry one of the king's daughters, Eleanor, the widowed countess of Holland (1302). This close connexion with the royal house did not prevent him, as it did not prevent Earl Thomas of Lancaster, from joining the opposition to the feeble Edward II. In 1310 Humphrey VIII. figured among the Lords Ordainers; though, with more patriotism than some of his fellow-commissioners, he afterwards followed the king to Bannockburn. He was taken captive in the battle, but exchanged for the wife of Robert Bruce. Subsequently he returned to the cause of his order, and fell on the side of Earl Thomas at the field of Boroughbridge (1322). With him, as with his father, the politics of the Marches

had been the main consideration; his final change of side was due to jealousy of the younger Despenser, whose lordship of Glamorgan was too great for the comfort of the Bohuns in Brecon. With the death of Humphrey VIII. the fortunes of the family enter on a more peaceful stage. Earl John (d. 1335) was inconspicuous; Humphrey IX. (d. 1361) merely distinguished himself as a captain in the Breton campaigns of the Hundred Years' War, winning the victories of Morlaix (1342) and La Roche Derrien (1347). His nephew and heir, Humphrey X., who inherited the earldom of Northampton from his father, was territorially the most important representative of the Bohuns. But the male line was extinguished by his death (1373). The three earldoms and the broad lands of the Bohuns were divided between two co-heiresses. Both married members of the royal house. The elder, Eleanor, was given in 1374 to Thomas of Woodstock, seventh son of Edward III.; the younger, Mary, to Henry, earl of Derby, son of John of Gaunt and afterwards Henry IV., in 1380 or 1381. From these two marriages sprang the houses of Lancaster and Stafford.

See J.E. Doyle's *Official Baronage of England* (1886), the *Complete Peerage* of G. E. C(okayne), (1867-1898); T.F. Tout's "Wales and the March during the Barons' War," in Owens College Historical Essays, pp. 87-136 (1902); J.E. Morris' *Welsh Wars of King Edward I.*, chs. vi., viii. (1901).

(H. W. C. D.)

BOIARDO, MATTEO MARIA, Count (1434-1404), Italian poet, who came of a noble and illustrious house established at Ferrara, but originally from Reggio, was born at Scandiano, one of the seignorial estates of his family, near Reggio di Modena, about the year 1434, according to Tiraboschi, or 1420 according to Mazzuchelli. At an early age he entered the university of Ferrara, where he acquired a good knowledge of Greek and Latin, and even of the Oriental languages, and was in due time admitted doctor in philosophy and in law. At the court of Ferrara, where he enjoyed the favour of Duke Borso d'Este and his successor Hercules, he was entrusted with several honourable employments, and in particular was named governor of Reggio, an appointment which he held in the year 1478. Three years afterwards he was elected captain of Modena, and reappointed governor of the town and citadel of Reggio, where he died in the year 1494, though in what month is uncertain.

Almost all Boiardo's works, and especially his great poem of the *Orlando Inamorato*, were composed for the amusement of Duke Hercules and his court, though not written within its precincts. His practice, it is said, was to retire to Scandiano or some other of his estates, and there to devote himself to composition; and Castelvetro, Vallisnieri, Mazzuchelli and Tiraboschi all unite in stating that he took care to insert in the descriptions of his poem those of the agreeable environs of his chateau, and that the greater part of the names of his heroes, as Mandricardo, Gradasse, Sacripant, Agramant and others, were merely the names of some of his peasants, which, from their uncouthness, appeared to him proper to be given to Saracen warriors. Be this as it may, the *Orlando Inamorato* deserves to be considered as one of the most important poems in Italian literature, since it forms the first example of the romantic epic worthy to serve as a model, and, as such, undoubtedly produced Ariosto's *Orlando Furioso*. Gravina and Mazzuchell have said, and succeeding writers have repeated on their authority, that Boiardo proposed to himself as his model the *Iliad* of Homer; that Paris is besieged like the city of Troy; that Angelica holds the place of Helen; and that, in short, the one poem is a sort of reflex image of the other. In point of fact, however, the subject-matter of the poem is derived from the *Fabulous Chronicle* of the pseudo-Turpin; though, with the exception of the names of Charlemagne, Roland, Oliver, and some other principal warriors, who necessarily figure as important characters in the various scenes, there is little resemblance between the detailed plot of the one and that of the other. The poem, which Boiardo did not live to finish, was printed at Scandiano the year after his death, under the superintendence of his son Count Camillo. The title of the book is without date; but a Latin letter from Antonia Caraffa di Reggio, prefixed to the poem, is dated the kalends of June 1495. A second edition, also without date, but which must have been printed before the year 1500, appeared at Venice; and the poem was twice reprinted there during the first twenty years of the 16th century. These editions are the more curious and valuable since they contain nothing but the text of the author, which is comprised in three books, divided into cantos, the third book being incomplete. But Niccolo degli Agostini, an indifferent poet, had the courage to continue the work commenced by Boiardo, adding to it three books, which were printed at Venice in 1526-1531, in 4to; and since that time no edition of the *Orlando* has been printed without the continuation of Agostini, wretched as it unquestionably is. Boiardo's poem suffers from the incurable defect of a laboured and heavy style. His story is skilfully constructed, the characters are well drawn and sustained throughout; many of the incidents show a power and fertility of imagination not inferior to that of Ariosto, but the perfect workmanship indispensable for a great work of art is wanting. The poem in its original shape was not popular, and has been completely superseded by the *Rifacimento* of Francesco Berni (*q.v.*).

The other works of Boiardo are—(1) *Il Timone*, a comedy, Scandiano, 1500, 4to; (2) *Sonnetti e Canzoni*, Reggio, 1499, 4to; (3) *Carmen Bucolicon*, Reggio, 1500, 4to; (4) *Cinque Capitoli in terza rima*, Venice, 1523 or 1533; (5) *Apulejo dell' Asino d'Oro*, Venice, 1516, 1518; (6) *Asino d'Oro de Luciano tradolto in volgare*, Venice, 1523, 8vo; (7) *Erodoto Alicarnasseo istorico, tradotto di Greco in Lingua Italiana*, Venice, 1533 and 1538, 8vo; (8) *Rerum Italicarum Scriptores*.

See Panizzi's *Boiardo* (9 vols., 1830-1831).

BOIE, HEINRICH CHRISTIAN (1744-1806), German author, was born at Meldorf in the then Danish province of Schleswig-Holstein on the 19th of July 1744. After studying law at Jena, he went in 1769 to Göttingen, where he became one of the leading spirits in the Göttingen "Dichterbund" or "Hain." Boie's poetical talent was not great, but his thorough knowledge of literature, his excellent taste and sound judgment, made

him an ideal person to awake the poetical genius of others. Together with F.W. Gotter (*q.v.*) he founded in 1770 the Göttingen *Musenalmanach*, which he directed and edited until 1775, when, in conjunction with C.W. von Dohm (1751-1820), he brought out *Das deutsche Museum*, which became one of the best literary periodicals of the day. In 1776 Boie became secretary to the commander-in-chief at Hanover, and in 1781 was appointed administrator of the province of Süderditmarschen in Holstein. He died at Meldorf on the 3rd of March 1806.

See K. Weinhold, *Heinrich Christian Boie* (Halle, 1868).

BOIELDIEU, FRANÇOIS ADRIEN (1775-1834), French composer of comic opera, was born at Rouen on the 15th of December 1775. He received his first musical education from M. Broche, the cathedral organist, who appears to have treated him very harshly. He began composing songs and chamber music at a very early age- his first opera, *La Fille coupable* (the libretto by his father), and his second opera, *Rosalie et Myrza*, being produced on the stage of Rouen in 1795. Not satisfied with his local success he went to Paris in 1795. His scores were submitted to Cherubini, Méhul and others, but met with little approbation. Grand opera was the order of the day. Boieldieu had to fall back on his talent as a pianoforte-player for a livelihood. Success came at last from an unexpected source. P.J. Garat, a fashionable singer of the period, admired Boieldleu's touch on the piano, and made him his accompanist. In the drawing-rooms of the Directoire Garat sang the charming songs and ballads with which the young composer supplied him. Thus Boieldieu's reputation gradually extended to wider circles. In 1796 *Les Deux lettres* was produced, and in 1797 *La Famille suisse* appeared for the first time on a Paris stage, and was well received. Several other operas followed in rapid succession, of which only *Le Calife de Bagdad* (1800) has escaped oblivion. After the enormous success of this work, Boieldieu felt the want of a thorough musical training and took lessons from Cherubini, the influence of that great master being clearly discernible in the higher artistic finish of his pupil's later compositions. In 1802 Boieldieu, to escape the domestic troubles caused by his marriage with Clotilde Aug. Mafleuroy, a celebrated ballet-dancer of the Paris opera, took flight and went to Russia, where he was received with open arms by the emperor Alexander. During his prolonged stay at St Petersburg he composed a number of operas. He also set to music the choruses of Racine's *Athalie*, one of his few attempts at the tragic style of dramatic writing. In 1811 he returned to his own country, where the following year witnessed the production of one of his finest works, *Jean de Paris*, in which he depicted with much felicity the charming coquetry of the queen of Navarre, the chivalrous *verve* of the king, the officious pedantry of the seneschal, and the amorous tenderness of the page. He succeeded Méhul as professor of composition at the Conservatoire in 1817. *Le Chapeau rouge* was produced with great success in 1818. Boieldieu's second and greatest masterpiece was his *Dame blanche* (1825). The libretto, written by Scribe, was partly suggested by Walter Scott's *Monastery*, and several original Scottish tunes cleverly introduced by the composer add to the melodious charm and local colour of the work. On the death of his wife in 1825, Boieldieu married a singer. His own death was due to a violent attack of pulmonary disease. He vainly tried to escape the rapid progress of the illness by travel in Italy and the south of France, but returned to Paris only to die on the 8th of October 1834.

Lives of Boieldieu have been written by Pougin (Paris, 1875), J.A. Refeuvaille (Rouen, 1836), Hequet (Paris, 1864), Emile Duval (Geneva, 1883). See also Adolphe Charles Adam, *Derniers souvenirs d'un musicien*.

BOIGNE, BENOÎT DE, Count (1751-1830), the first of the French military adventurers in India, was born at Chambéry in Savoy on the 8th of March 1751, being the son of a fur merchant. He joined the Irish Brigade in France in 1768, and subsequently he entered the Russian service and was captured by the Turks. Hearing of the wealth of India, he made his way to that country, and after serving for a short time in the East India Company, he resigned and joined Mahadji Sindhia in 1784 for the purpose of training his troops in the European methods of war. In the battles of Lalsot and Chaksana Boigne and his two battalions proved their worth by holding the field when the rest of the Mahratta army was defeated by the Rajputs. In the battle of Agra (1788) he restored the Mahratta fortunes, and made Mahadji Sindhia undisputed master of Hindostan. This success led to his being given the command of a brigade of ten battalions of infantry, with which he won the victories of Patan and Merta in 1790. In consequence Boigne was allowed to raise two further brigades of disciplined infantry, and made commander-in-chief of Sindhia's army. In the battle of Lakhairi (1793) he defeated Holkar's army. On the death of Mahadji Sindhia in 1794, Boigne could have made himself master of Hindostan had he wished it, but he remained loyal to Daulat Rao Sindhia. In 1795 his health began to fail, and he resigned his command, and in the following year returned to Europe with a fortune of £400,000. He lived in retirement during the lifetime of Napoleon, but was greatly honoured by Louis XVIII. He died on the 21st of June 1830.

See H. Compton, *European Military Adventurers of Hindustan* (1892).

BOII (perhaps = "the terrible"), a Celtic people, whose original home was Gallia Transalpina. They were known to the Romans, at least by name, in the time of Plautus, as is shown by the contemptuous reference in the *Captivi* (888). At an early date they split up into two main groups, one of which made its way into Italy, the other into Germany. Some, however, appear to have stayed behind, since, during the Second Punic War,

Magalus, a Boian prince, offered to show Hannibal the way into Italy after he had crossed the Pyrenees (Livy xxi. 29). The first group of immigrants is said to have crossed the Pennine Alps (Great St Bernard) into the valley of the Po. Finding the district already occupied, they proceeded over the river, drove out the Etruscans and Umbrians, and established themselves as far as the Apennines in the modern Romagna. According to Cato (in Pliny, *Nat. Hist.* iii. 116) they comprised as many as 112 different tribes, and from the remains discovered in the tombs at Hallstatt, La Tène and other places, they appear to have been fairly civilized. Several wars took place between them and the Romans. In 283 they were defeated, together with the Etruscans, at the Vadimonian lake; in 224, after the battle of Telamon in Etruria, they were forced to submit. But they still cherished a hatred of the Romans, and during the Second Punic War (218), irritated by the foundation of the Roman colonies of Cremona and Placentia, they rendered valuable assistance to Hannibal. They continued the struggle against Rome from 201 to 191, when they were finally subdued by P. Cornelius Scipio Nasica, and deprived of nearly half their territory. According to Strabo (v. p. 213) the Boii were driven back across the Alps and settled on the land of their kinsmen, the Taurisci, on the Danube, adjoining Vindelicia and Raetia. Most authorities, however, assume that there had been a settlement of the Boii on the Danube from very early times, in part of the modern Bohemia (anc. *Boiohemum*, "land of the Boii"). About 60 B.C. some of the Boii migrated to Noricum and Pannonia, when 32,000 of them joined the expedition of the Helvetians into Gaul, and shared their defeat near Bibracte (58). They were subsequently allowed by Caesar to settle in the territory of the Aedui between the Loire and the Allier. Their chief town was Gorgobina (site uncertain). Those who remained on the Danube were exterminated by the Dacian king, Boerebista, and the district they had occupied was afterwards called the "desert of the Boii" (Strabo vii. p. 292). In A.D. 69 a Boian named Mariccus stirred up a fanatical revolt, but was soon defeated and put to death. Some remnants of the Boii are mentioned as dwelling near Bordeaux; but Mommsen inclines to the opinion that the three groups (in Bordeaux, Bohemia and the Po districts) were not really scattered branches of one and the same stock, but that they are instances of a mere similarity of name.

The Boii, as we know them, belonged almost certainly to the Early Iron age. They probably used long iron swords for dealing cutting blows, and from the size of the handles they must have been a race of large men (cf. Polybius ii. 30). For their ethnological affinities and especially their possible connexion with the Homeric Achaeans see W. Ridgeway's *Early Age of Greece* (vol. i., 1901).

See L. Contzen, *Die Wanderungen der Kelten* (Leipzig, 1861); A. Desjardins, *Géographie historique de la Gaule romaine*, ii. (1876-1893); T.R. Holmes, *Caesar's Conquest of Gaul* (1899), pp. 426-428; T. Mommsen, *Hist. of Rome*, ii. (Eng. trans. 5 vols., 1894), p. 373 note; M. Ihm in Pauly-Wissowa's *Realencyclopadie*, iii. pt. 1 (1897); A. Holder, *Alt-celtischer Sprachschatz*.

BOIL, in medicine, a progressive local inflammation of the skin, taking the form of a hard suppurating tumour, with a core of dead tissue, resulting from infection by a microbe, *Staphylococcus pyogenes*, and commonly occurring in young persons whose blood is disordered, or as a complication in certain diseases. Treatment proceeds on the lines of bringing the mischief out, assisting the evacuation of the boil by the lancet, and clearing the system. In the English Bible, and also in popular medical terminology, "boil" is used of various forms of ulcerous affection. The boils which were one of the plagues in Egypt were apparently the bubonic plague. The terms Aleppo boil (or button), Delhi boil, Oriental boil, Biskra button, &c., have been given to a tropical epidemic, characterized by ulcers on the face, due to a diplococcus parasite.

BOILEAU-DESPRÉAUX, NICOLAS (1636-1711), French poet and critic, was born on the 1st of November 1636 in the rue de Jérusalem, Paris. The same Despréaux was derived from a small property at Crosne near Villeneuve Saint-Georges. He was the fifteenth child of Gilles Boileau, a clerk in the parlement. Two of his brothers attained some distinction: Gilles Boileau (1631-1669), the author of a translation of Epictetus; and Jacques Boileau, who became a canon of the Sainte-Chapelle, and made valuable contributions to church history. His mother died when he was two years old; and Nicolas Boileau, who had a delicate constitution, seems to have suffered something from want of care. Sainte-Beuve puts down his somewhat hard and unsympathetic outlook quite as much to the uninspiring circumstances of these days as to the general character of his time. He cannot be said to have been early disenchanted, for he never seems to have had any illusions; he grew up with a single passion, "the hatred of stupid books." He was educated at the Collège de Beauvais, and was then sent to study theology at the Sorbonne. He exchanged theology for law, however, and was called to the bar on the 4th of December 1656. From the profession of law, after a short trial, he recoiled in disgust, complaining bitterly of the amount of chicanery which passed under the name of law and justice. His father died in 1657, leaving him a small fortune, and thenceforward he devoted himself to letters.

Such of his early poems as have been preserved hardly contain the promise of what he ultimately became. The first piece in which his peculiar powers were displayed was the first satire (1660), in imitation of the third satire of Juvenal; it embodied the farewell of a poet to the city of Paris. This was quickly followed by eight others, and the number was at a later period increased to twelve. A twofold interest attaches to the satires. In the first place the author skilfully parodies and attacks writers who at the time were placed in the very first rank, such as Jean Chapelain, the abbé Charles Cotin, Philippe Quinault and Georges de Scudéry; he openly raised the standard of revolt against the older poets. But in the second place he showed both by precept and practice what were the poetical capabilities of the French language. Prose in the hands of such writers as Descartes and Pascal had proved itself a flexible and powerful instrument of expression, with a distinct mechanism and form. But except with Malherbe, there had been no attempt to fashion French versification

according to rule or method. In Boileau for the first time appeared terseness and vigour of expression, with perfect regularity of verse structure. His admiration for Molière found expression in the stanzas addressed to him (1663), and in the second satire (1664). In 1664 he composed his prose *Dialogue des héros de roman*, a satire on the elaborate romances of the time, which may be said to have once for all abolished the lucubrations of La Calprenède, Mlle de Scudéry and their fellows. Though fairly widely read in manuscript, the book was not published till 1713, out of regard, it is said, for Mlle de Scudéry. To these early days belong the reunions at the *Moulon Blanc* and the *Pomme du Pin*, where Boileau, Molière, Racine, Chapelle and Antoine Furetière met to discuss literary questions. To Molière and Racine he proved a constant friend, and supported their interests on many occasions.

In 1666, prompted by the publication of two unauthorized editions, he published *Satires du Sieur D....*, containing seven satires and the *Discours au roi*. From 1669 onwards appeared his epistles, graver in tone than the satires, maturer in thought, more exquisite and polished in style. The *Épitres* gained for him the favour of Louis XIV., who desired his presence at court. The king asked him which he thought his best verses. Whereupon Boileau diplomatically selected as his "least bad" some still unprinted lines in honour of the grand monarch and proceeded to recite them. He received forthwith a pension of 2000 livres. In 1674 his two masterpieces, *L'Art poétique* and *Le Lutrin*, were published with some earlier works as the *Œuvres diverses du sieur D....* The first, in imitation of the *Ars Poetica* of Horace, lays down the code for all future French verse, and may be said to fill in French literature a parallel place to that held by its prototype in Latin. On English literature the maxims of Boileau, through the translation revised by Dryden, and through the magnificent imitation of them in Pope's *Essay on Criticism*, have exercised no slight influence. Boileau does not merely lay down rules for the language of poetry, but analyses carefully the various kinds of verse composition, and enunciates the principles peculiar to each. Of the four books of *L'Art poétique*, the first and last consist of general precepts, inculcating mainly the great rule of *bon sens*; the second treats of the pastoral, the elegy, the ode, the epigram and satire; and the third of tragic and epic poetry. Though the rules laid down are of value, their tendency is rather to hamper and render too mechanical the efforts of poetry. Boileau himself, a great, though by no means infallible critic in verse, cannot be considered a great poet. He rendered the utmost service in destroying the exaggerated reputations of the mediocrities of his time, but his judgment was sometimes at fault. The *Lutrin*, a mock heroic poem, of which four cantos appeared in 1674, furnished Alexander Pope with a model for the *Rape of the Lock*, but the English poem is superior in richness of imagination and subtlety of invention. The fifth and sixth cantos, afterwards added by Boileau, rather detract from the beauty of the poem; the last canto in particular is quite unworthy of his genius. In 1674 appeared also his translation of Longinus *On the Sublime*, to which were added in 1693 certain critical reflections, chiefly directed against the theory of the superiority of the moderns over the ancients as advanced by Charles Perrault.

Boileau was made historiographer to the king in 1677. From this time the amount of his production diminished. To this period of his life belong the satire, *Sur les femmes*, the ode, *Sur la prise de Namur*, the epistles, *À mes vers* and *Sur l'amour de Dieu*, and the satire *Sur l'homme*. The satires had raised up a crowd of enemies against Boileau. The 10th satire, on women, provoked an *Apologie des femmes* from Charles Perrault. Antoine Arnauld in the year of his death wrote a letter in defence of Boileau, but when at the desire of his friends he submitted his reply to Bossuet, the bishop pronounced all satire to be incompatible with the spirit of Christianity, and the 10th satire to be subversive of morality. The friends of Arnauld had declared that it was inconsistent with the dignity of a churchman to write on any subject so trivial as poetry. The epistle, *Sur l'amour de Dieu*, was a triumphant vindication on the part of Boileau of the dignity of his art. It was not until the 15th of April 1684 that he was admitted to the Academy, and then only by the king's wish. In 1687 he retired to a country-house he had bought at Auteuil, which Racine, because of the numerous guests, calls his *hôtellerie d'Auteuil*. In 1705 he sold his house and returned to Paris, where he lived with his confessor in the cloisters of Notre Dame. In the 12th satire, *Sur l'équivoque*, he attacked the Jesuits in verses which Sainte-Beuve called a recapitulation of the *Lettres provinciales* of Pascal. This was written about 1705. He then gave his attention to the arrangement of a complete and definitive edition of his works. But the Jesuit fathers obtained from Louis XIV. the withdrawal of the privilege already granted for the publication, and demanded the suppression of the 12th satire. These annoyances are said to have hastened his death, which took place on the 13th of March 1711.

Boileau was a man of warm and kindly feelings, honest, outspoken and benevolent. Many anecdotes are told of his frankness of speech at court, and of his generous actions. He holds a well-defined place in French literature, as the first who reduced its versification to rule, and taught the value of workmanship for its own sake. His influence on English literature, through Pope and his contemporaries, was not less strong, though less durable. After much undue depreciation Boileau's critical work has been rehabilitated by recent writers, perhaps to the extent of some exaggeration in the other direction. It has been shown that in spite of undue harshness in individual cases most of his criticisms have been substantially adopted by his successors.

Numerous editions of Boileau's works were published during his lifetime. The last of these, *Œuvres diverses* (1701), known as the "favourite" edition of the poet, was reprinted with variants and notes by Alphonse Pauly (2 vols., 1894). The critical text of his works was established by Berriat Saint-Prix, *Œuvres de Boileau* (4 vols., 1830-1837), who made use of some 350 editions. This text, edited with notes by Paul Chéron, with the *Boloeana* of 1740, and an essay by Sainte-Beuve, was reprinted by Garnier *frères* (1860).

See also Sainte-Beuve, *Causeries du lundi*, vol. vi.; F. Brunetière, "L'Esthétique de Boileau" (*Revue des Deux Mondes*, June 1889), and an exhaustive article by the same critic in *La Grande encyclopédie*; G. Lanson, *Boileau* (1892), in the series of *Grands écrivains français*.

BOILER, a vessel in which water or other liquid is heated to the boiling point; specifically, the apparatus by which steam is produced from water, as one step in the process whereby the potential energy of coal or other fuel is converted into mechanical work by means of the steam-engine. Boilers of the latter kind must all possess

certain essential features, whilst of other qualities that are desirable some may not be altogether compatible with the special conditions under which the boilers are to be worked. Amongst the essentials are a receptacle capable of containing the water and the steam produced by its evaporation, and strong enough continuously to withstand with safety the highest pressure of steam for which the boiler is intended. Another essential is a furnace for burning the fuel, and a further one is the provision of a sufficiency of heating surface for the transmission of the heat produced by the combustion of the fuel to the water which is required to be evaporated. Desirable qualities are that the arrangements of the furnaces should be such that a reasonably perfect combustion of the fuel should be possible, and that the heating surfaces should be capable of transmitting a large proportion of the heat produced to the water so as to obtain a high evaporative efficiency. Further, the design generally should be compact, not too heavy or costly, and such that the cleaning necessary to maintain the evaporative efficiency can be easily effected. It should also be such that the cost of upkeep will be small, and that only an average amount of skill and attention will be required under working conditions. It is for providing these qualities in different degrees according to the special requirements of various circumstances that the very different designs of the various types of boilers have been evolved.

Classes of Boilers.—Boilers generally may be divided into two distinct classes, one comprising those which are generally called “tank” boilers, containing relatively large quantities of water, and the other those which are generally called “water-tube” boilers, in which the water is mainly contained in numerous comparatively small tubes. There are, however, some types of boiler which combine to some extent the properties of both these classes. Each class has its representatives amongst both land and marine boilers. In “tank” boilers the outer shell is wholly or partially cylindrical, this form being one in which the necessary strength can be obtained without the use of a large number of stays. The boilers are generally internally fired, the furnace plates being surrounded with water and forming the most efficient portion of the heating surfaces. On leaving the furnace the products of combustion are led into a chamber and thence through flues or through numerous small tubes which serve to transmit some of the heat of combustion to the water contained in the boiler. In “water-tube” boilers the fire is usually placed under a collection of tubes containing water and forming the major portion of the heating surface of the boiler. Both the fire and the tubes are enclosed in an outer casing of brickwork or other fire-resisting substance. In some forms of water-tube boiler the fire is entirely surrounded by water-tubes and the casing is in no part exposed to the direct action of the fire. In “tank” boilers generally no difficulty is experienced in keeping all the heating surfaces in close contact with water, but in “water-tube” boilers special provision has to be made in the design for maintaining the circulation of water through the tubes. (For “flash” boilers see Motor Vehicles, and for domestic hot-water boilers Heating.)

Tank Boilers.—Of large stationary boilers the forms most commonly used are those known as the “Lancashire” boiler, and its modification the “Galloway” boiler. These boilers are made from 26 to 30 ft. long, with diameters from 6½ to 8 ft., and have two cylindrical furnace flues which in the “Lancashire” boiler extend for its whole length (see fig. 3). The working pressure is about 60 ℔ per sq. in. in the older boilers, from 100 ℔ to 120 ℔ per sq. in. in those supplying steam to compound engines, and from 150 to 170 ℔ where triple expansion engines are used. In some cases they have been constructed for a pressure of 200 ℔ per sq. in. The furnace flues are usually made in sections from 3 to 3½ ft. long. Each section consists of one plate bent into a cylindrical form, the longitudinal joint being welded, and is flanged at both ends, the various pieces being joined together by an “Adamson” joint (fig. 1.). It will be seen that these joints do not expose either rivets or double thickness of plate to the action of the fire; they further serve as stiffening rings to prevent collapse of the flue. In most of these boilers the heating surface is increased by fitting in the furnace flues a number of “Galloway” tubes. These are conical tubes, made with a flange at each end, by means of which they are connected to the furnace plate. They are so proportioned that the diameter of the large end of the tube is slightly greater than that of the flange of the small end; this enables them to be readily removed and replaced if necessary. These tubes not only add to the heating surface, but they stiffen the flue, promote circulation of the water in the boiler, and by mixing up the flue gases improve the evaporative efficiency.

Lancashire.

Fig. 1.—Adamson Joint.

In the “Galloway” boiler the two furnaces extend only for about 9 or 10 ft. into the boiler, and lead into a large chamber or flue in which a number of “Galloway” tubes are fitted, and which extends from the furnace end to the end of the boiler. A cross section of this flue showing the distribution of the Galloway tubes is shown in fig. 2. When boilers less than about 6½ ft. in diameter are needed, a somewhat similar type to the Lancashire boiler is used containing only one furnace. This is called a “Cornish” boiler.

In all three types of boiler the brickwork is constructed to form one central flue passing along the bottom of the boiler and two side flues extending up the side nearly to the water-level. A cross section of the brickwork is shown in fig. 2. The usual arrangement is for the flue gases to be divided as they leave the internal flue; one-half returns along each side flue to the front of the boiler, and the whole then passes downwards into the central flue, travelling under the bottom of the boiler until the gases again reach the back end, where they pass into the chimney. In a few cases the arrangement is reversed, the gases first passing along the bottom flue and returning along the side flues. This latter arrangement, whilst promoting a more rapid circulation of water, has the disadvantage of requiring two dampers, and it is not suitable for those cases in which heavy deposits form on the bottoms of the boilers.

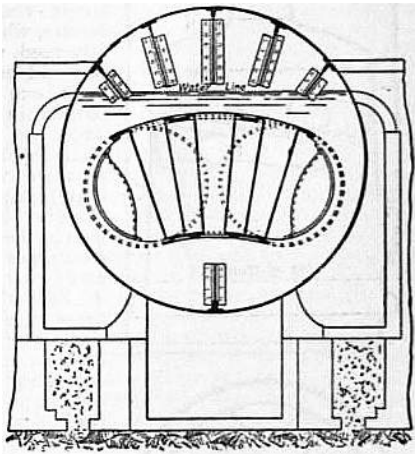


Fig. 2.—Galloway Boiler: Section beyond the Bridge.

Where floor space is limited and also for small installations, other forms of cylindrical boilers are used, most of them being of the vertical type. That most commonly used is the simple vertical boiler, with a plain vertical fire-box, and an internal smoke stack traversing the steam space. The fire-box is made slightly tapering in diameter, the space between it and the shell being filled with water. In all but the small sizes cross

Vertical.

tubes are generally fitted. These are made about 9 in. in diameter of ⅜-in. plate flanged at each end to enable them to be riveted to the fire-box plates. They are usually fitted with a slight inclination to facilitate water circulation. and a hand-hole closed by a suitable door is provided in the outer shell opposite to each tube for cleaning purposes. A boiler of this kind is illustrated in fig. 4. This form is often used on board ship for auxiliary purposes. Where more heating surface is required than can be obtained in the cross-tube boiler other types of vertical boiler are employed. For instance, in the "Tyne" boiler (fig. 5) the furnace is hemispherical, and the products of combustion are led into an upper combustion chamber traversed by four or more inclined water-tubes of about 9 in. diameter and by several vertical water-tubes of less diameter. In the "Victoria" boiler made by Messrs Clarke, Chapman & Co., and illustrated in fig. 6, the furnace is hemispherical; the furnace gases are led to an internal combustion chamber, and thence through numerous horizontal smoke-tubes to a smoke-box placed on the side of the boiler. In the somewhat similar boiler known as the "Cochran," the combustion chamber is made with a "dry" back. Instead of a water space at the back of the chamber, doors lined with firebrick are fitted. These give easy access to the tube ends.

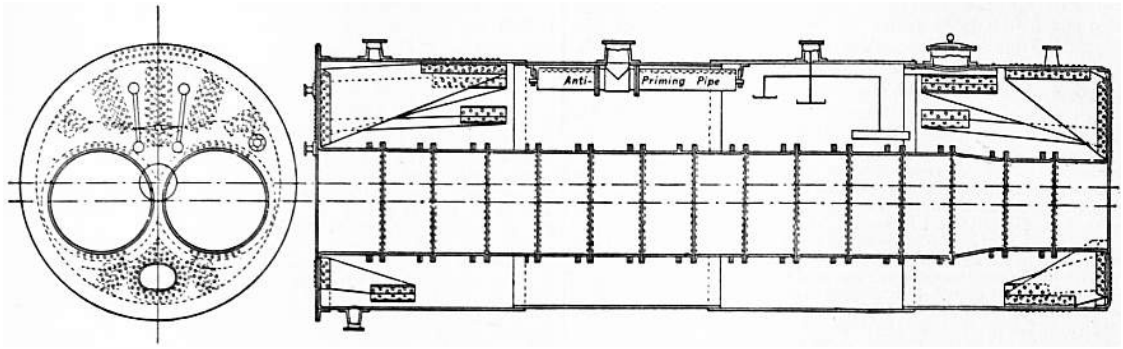


FIG. 3.—Lancashire Boiler (Messrs Tinker, Ltd.).

Marine.

The cylindrical multitubular return tube boiler is in almost universal use in merchant steamers. It is made in various sizes ranging up to 17 ft. in diameter, the usual working pressure being from 160 to 200 lb per sq. in., although in some few cases pressures of 265 lb per sq. in. are in use. These boilers are of two types, double- and single-ended. In single-ended boilers, which are those most generally used, the furnaces are fitted at one end only and vary in number from one in the smallest boiler to four in the largest. Three furnaces are the most usual practice. Each furnace generally has its own separate combustion chamber. In four furnace boilers, however, one chamber is sometimes made common to the two middle furnaces, and sometimes one chamber is fitted to each pair of side furnaces. In double-ended boilers furnaces are fitted at each end. In some cases each furnace has a separate combustion chamber, but more usually one chamber is made to serve for two furnaces, one at each end of the boiler. The two types of boilers are shown in figs. 7 and 8, which illustrate boilers made by Messrs D. Rowan & Co. of Glasgow, and which may be taken as representing good modern practice. The furnaces used in the smaller sizes are often of the plain cylindrical type, the thickness of plate varying from ⅜ in. up to ¾ in. according to the diameter of the furnace and the working pressure. Occasionally furnaces with "Adamson" joints similar to those used in Lancashire boilers are employed, but for large furnaces and for high pressures corrugated or ribbed furnaces are usually adopted. Sketches of the sections of these are shown in fig. 9. The sections of the Morison, Fox and Deighton types are made from plates originally rolled of a uniform thickness, made into a cylindrical form with a welded longitudinal joint and then corrugated, the only difference between them being in the shapes of the corrugations. In the other three types the plates from which the furnaces are made are rolled with ribs or thickened portions at distances of 9 in. These furnaces are stronger to resist collapse than plain furnaces of the same thickness, and accommodate themselves more readily to changes of temperature.

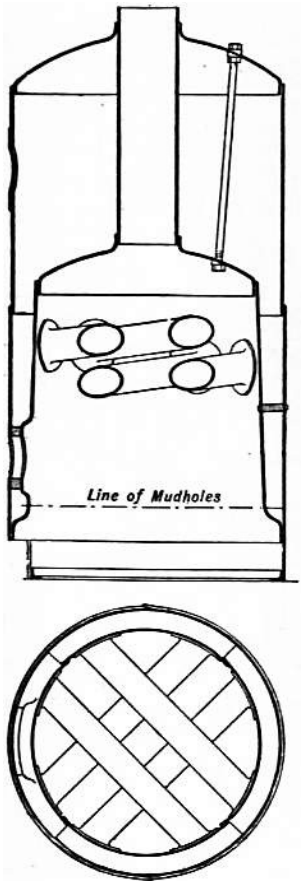


FIG. 4.—Simple Vertical Boiler.

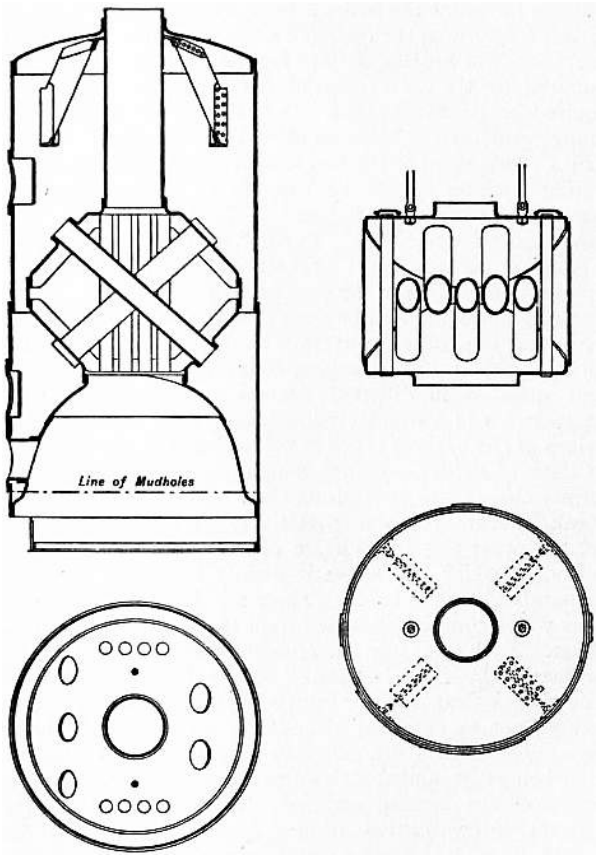


FIG. 5.—Vertical Boiler with Water-tubes (the “Tyne,” by Messrs Clarke, Chapman & Co.).

There are two distinct types of connexion between the furnaces and the combustion chambers. In one, shown in fig. 8, the furnace is flanged at the crown portion for riveting to the tube plate, and the lower part of the furnace is riveted to the “wrapper” or side plate of the combustion chamber. In the other type, shown in fig. 7, and known generally as the “Gourlay back end,” the end of the furnace is contracted into an oval conical form, and is then flanged outwards round the whole of its circumference. The tube plate is made to extend to the bottom of the combustion chamber, and the furnace is riveted to the tube plate. The advantage of the Gourlay back end is that in case of accident to the furnace it can be removed from the boiler and be replaced by one of the same design without disturbing the end plates, which is not possible with the other design. The Gourlay back end, however, is not so stiff as the other, and more longitudinal stays are required in the boiler.

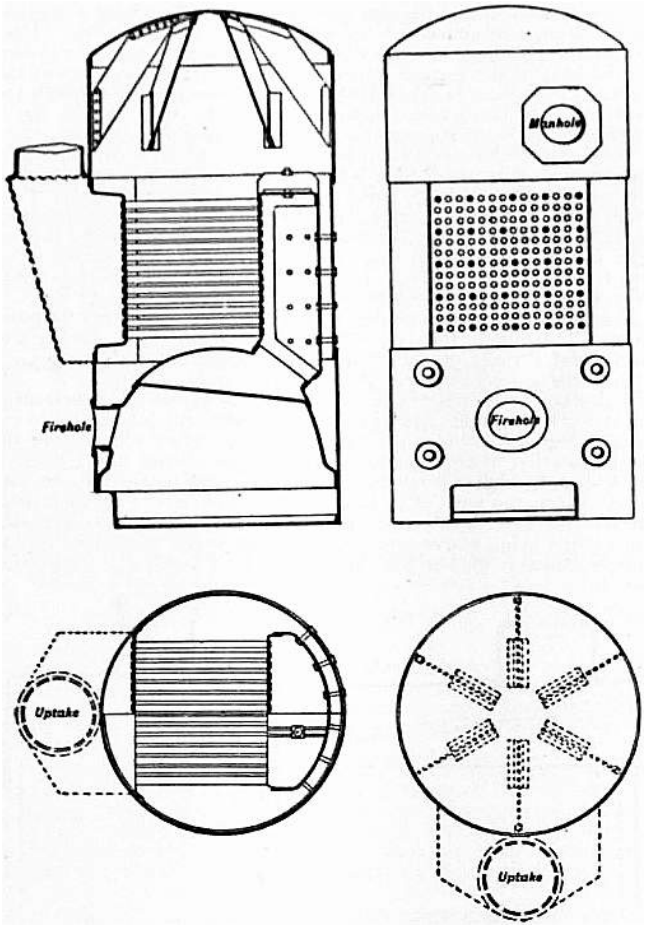


FIG. 6.—Vertical Boiler with internal combustion chamber (the “Victoria,” by Messrs Clarke, Chapman & Co.).

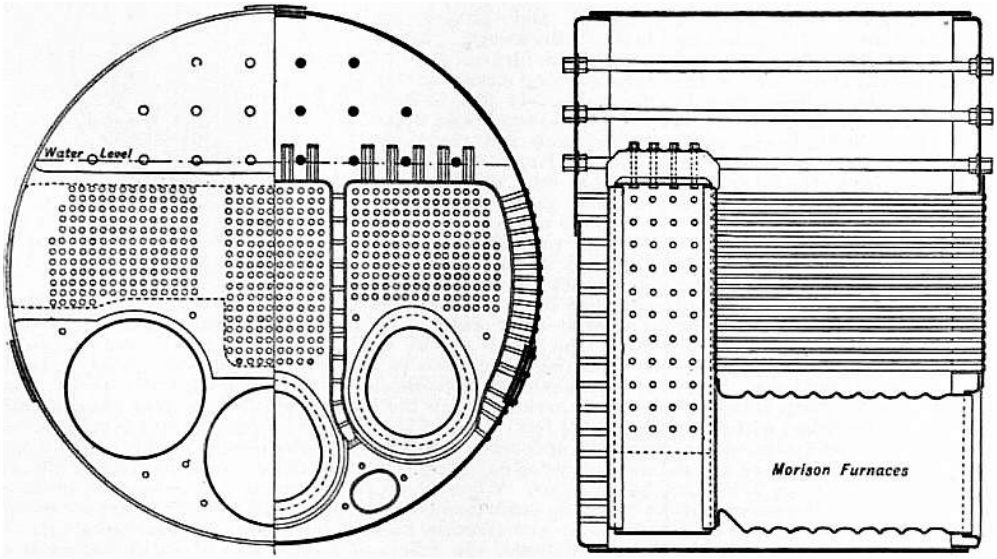


FIG. 7.—Single-ended Marine Boiler.

The flat sides and backs of the combustion chambers are stayed either to one another or to the shell of the boiler by numerous screw stays which are screwed through the two plates they connect, and which are nearly always fitted with nuts inside the combustion chambers. The tops of the chambers are usually stayed by strong girders resting upon the tube plates and chamber back plates. In a few cases, however, they are stayed by vertical stays attached to T bars riveted to the boiler shell. A few boilers are made in which the chamber tops are strengthened by heavy transverse girder plates. The end plates of the boiler in the steam space and below the combustion chambers are stayed by longitudinal stays passing through the whole length of the boiler and secured by double nuts at each end. The tube plates are strengthened by stay tubes screwed into them.

Where natural or chimney draught is used the tubes are generally made 3 or 3¼ in. outside diameter and are rarely more than 7 ft. long, but where "forced" draught is employed they are usually made 2½ in. diameter and 8 to 8½ ft. long. A clear space of 1¼ in. between the tubes is almost always arranged for, irrespective of size of tubes.

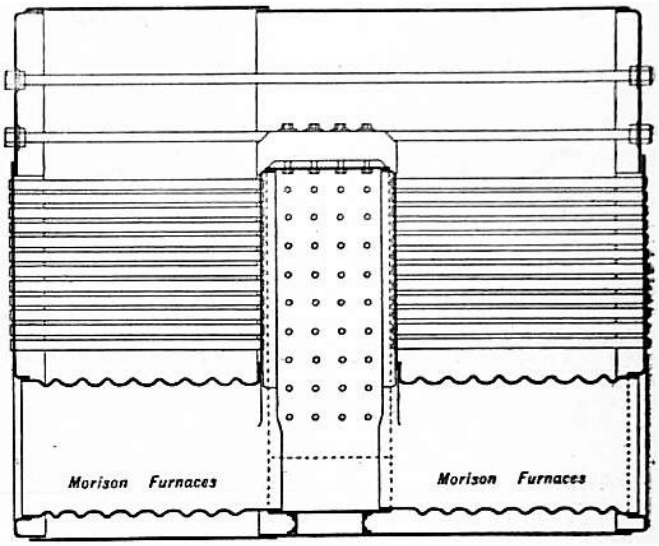


FIG. 8.—Double-ended Marine Boiler.

Stay tubes are screwed at both ends, the threads of the two ends being continuous so that they can be screwed into both tube plates; occasionally nuts are fitted to the front ends. The stay tubes are expanded into the plates and then beaded over.

Locomotive.

The locomotive boiler consists of a cylindrical barrel attached to a portion containing the fire-box, which is nearly rectangular both in horizontal and vertical section. The fire-box sides are stayed to the fire-box shell by numerous stays about 1 in. in diameter, usually pitched 4 in. apart both vertically and horizontally. The top of the fire-box in small boilers is stayed by means of girder stays running longitudinally and supported at the ends upon the tube plate and the opposite fire-box plate. In some boilers the girders are partly supported by slings from the crown of the boiler. In larger boilers the crown of the boiler above the fire-box is made flat and the fire-box crown is supported by vertical stays connecting it with the shell crown. Provision is generally made for the expansion of the tube plate, which is of copper, by allowing the two or three cross rows of stays nearest the tube plate to have freedom of motion upwards but not downwards. The ordinary tubes are usually 1¾ in. diameter. The fire-bars are generally, though not always, made to slope downwards away from the fire door, and just below the lowest tubes a fire-bridge or baffle is fitted, extending about half-way from the tube plate to the fire-door side of the fire-box. In some cases water-tubes are fitted, extending right across the fire-box. In a boiler for the London & South-Western Railway Co., having a grate area of 31.5 sq. ft. and a total heating surface of 2727 sq. ft., there are 112 water-tubes each 2¾ in. diameter. These are arranged in two clusters, each containing 56, one set being placed above the fire-bridge, and the other set nearer the fire-door end of the boiler. The water-tubes are of seamless steel, and are expanded into the fire-box side plates. In way of these tubes the outer shell side plates are supported by stay bars passing right through the water-tubes. The usual pressure of locomotive boilers is about

175 ℔ to 200 ℔ per sq. in.

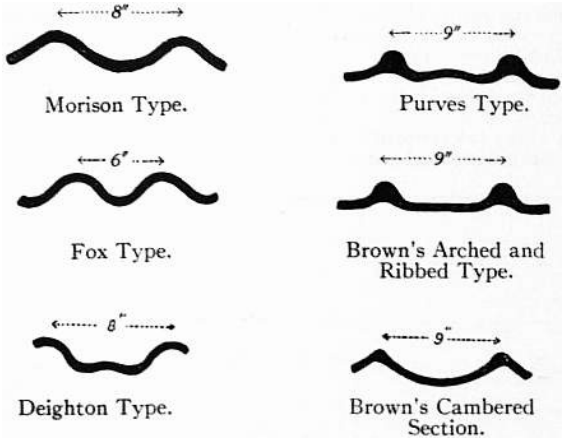


FIG. 9.

A good example of an express locomotive boiler is shown in fig. 10. In this case the grate area is 30.9 sq. ft. and the heating surface 2500 sq. ft. The barrel is 5 ft. 6 in. diameter, 16 ft. long between tube plates. The fire-box crown is stayed by vertical stays extending to the shell crown, except for the three rows of stays nearest the tube plates. These are supported by cross girders resting upon brackets secured to the outer shell.

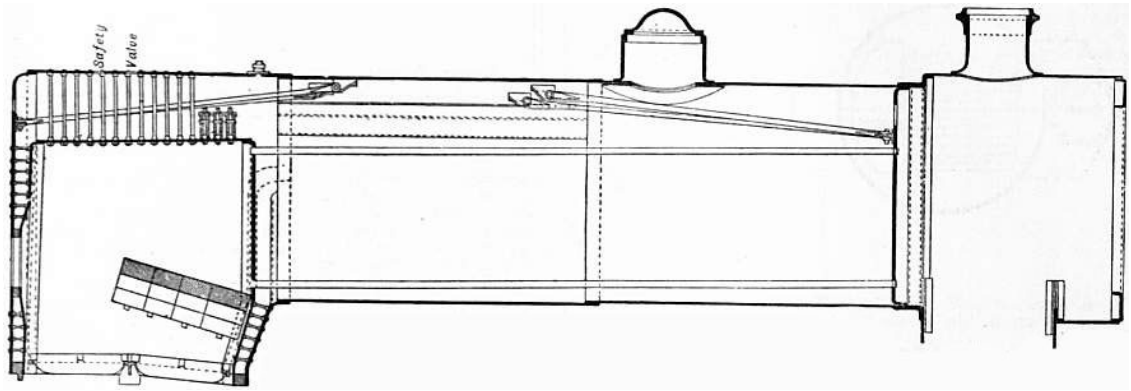
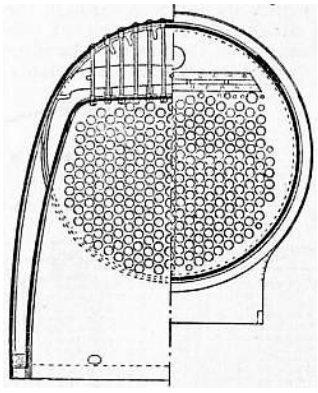


FIG. 10.—Express Locomotive Boiler, with widened fire-box (Great Northern Railway, England).

Babcock and Wilcox stationary.

Water-Tube Boilers.—The "Babcock & Wilcox" boiler, as fitted for land purposes, and illustrated in fig. 11, consists of a horizontal cylinder forming a steam chest, having dished ends and two specially constructed cross-boxes riveted to the bottom. Under the cylinder is placed a sloping nest of tubes, under the upper end of which is the fire. The sides and back of the boiler are enclosed in brickwork up to the height of the centre of the horizontal cylinder and the front is fitted with an iron casing lined with brick at the lower part. Suitable brickwork baffles are arranged between the tubes themselves, and between the nests of tubes and the cylinder, to ensure a proper circulation of the products of combustion, which are made to pass between the tubes three times. The nest of tubes consists of several separate elements, each formed by a front and back header made of wrought steel of sinuous form connected by a number of tubes. The upper ends of the front headers are connected by short tubes to the front cross-box of the horizontal cylinder, the lower ends being closed. The upper ends of the back headers are connected by longer pipes to the back cross-box, and their lower ends by short pipes to a horizontal mud drum to which a blow-off cock and pipe are attached. The headers are furnished with holes on two opposite sides; those on one side form the means of connexion between the headers and tubes, and the others allow access for fixing the tubes in position and cleaning. The outer holes are oval, and closed by special fittings shown in fig. 18, the watertightness of the joints being secured by the outer cover plates. The holes being oval, the inside fitting can be placed in position from outside, and it is so made as to cover the opening and prevent any great outrush of steam or water should the bolt break. Any desired working pressure can be provided for in these boilers; in some special cases it rises as high as 500 ℔ per sq. in., but a more usual pressure is 180 ℔ Like all water-tube boilers, they require to be frequently cleaned if impure feed-water is used, but the straightness of their tubes enables their condition to be ascertained at any time when the boiler is out of use, and any accumulation of scale to be removed. The superheaters, which are frequently fitted, consist of two cross-boxes or headers placed transversely under the cylindrical drum and connected by numerous C-shaped tubes. They are situated between the tubes and the steam-chest, and are exposed to the heat of the furnace gases after their first passage across the tubes. The steam is taken by an internal pipe passing through the bottom of the drum into the upper cross-box, then through the C tubes into the lower box, and thence to the steam pipe. When steam is being raised, the superheater is flooded with water, which is drained out through a blow-off pipe before communication is opened with the steam-pipe. In large boilers of this type, two steam-chests are placed side by side connected together by two cross steam pipes and by the mud drum. Each, however, has its own separate feed supply. The largest boiler made has two steam chests 4½ ft. diameter by 25½ ft. long, a grate surface of 85 sq. ft., and a total heating surface of 6182 sq. ft.



Another type of water-tube boiler in use for stationary purposes is the “Stirling” (fig. 12). This boiler consists of four or five horizontal drums, of which the three upper form the steam-space, and the one or two lower contain water. The lower drums, where two are fitted, are connected to each other at about the middle of their height by horizontal tubes, and to the upper drums by numerous nearly vertical tubes which form the major portion of the heating surfaces. The central upper drum is at a slightly higher level than the others, and communicates with that nearest the back of the boiler by a set of curved tubes entirely above the water-level, and with the front drum by two sets—the upper one being above and the lower below the water-level. The whole boiler is enclosed in brickwork, into which the supporting columns and girders are built. Brickwork baffles compel the furnace gases to take specified courses among the tubes. It will be seen that the space between the boiler front and the tubes form a large combustion chamber into which all the furnace gases must pass before they enter the spaces between the tubes; in this chamber a baffle-bridge is sometimes built. Another chamber is formed between the first and second sets of tubes. The feed-water enters the back upper drum, and must pass down the third set of tubes into the lower drum before it reaches the other parts of the boiler. Thus the coldest water is always where the temperature of the furnace gases is lowest; and as the current through the lower drum is slight, the solid matters separated from the feed-water while its temperature is being raised have an opportunity of settling to the bottom of this drum, where the heating is not great and where therefore their presence will not be injurious. When superheaters are required, they are made of two drums connected by numerous small tubes, and are somewhat similar in construction to the boiler proper. The superheater is placed between the first and second sets of tubes, where it is exposed to the furnace gases before too much heat has been taken from them. Arrangements are provided for flooding the superheater while steam is being raised, and for draining it before the steam is passed through it.

Stirling.

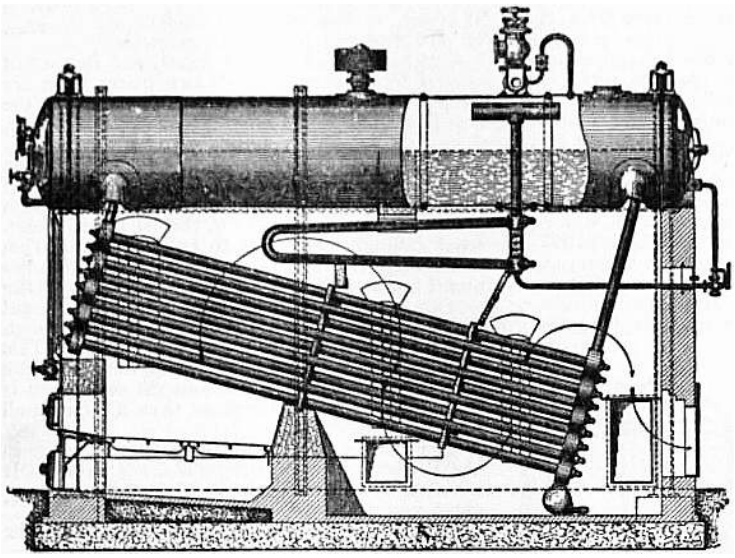


Fig. 11.—Babcock & Wilcox Water-tube Boiler fitted with Superheaters.

A somewhat similar boiler is made by Messrs. Clarke, Chapman & Co., and is known as the “Woodeson” boiler (fig. 13). It consists of three upper drums placed side by side connected together by numerous short tubes, some above and some below the water-level, and of three smaller lower drums also connected by short cross tubes. The upper and lower drums are connected by numerous nearly vertical straight tubes. The whole is enclosed in firebrick casing. The design permits of the insides of all the tubes being readily inspected, and also of any tube being taken out and renewed without displacing any other part of the boiler.

Woodeson.

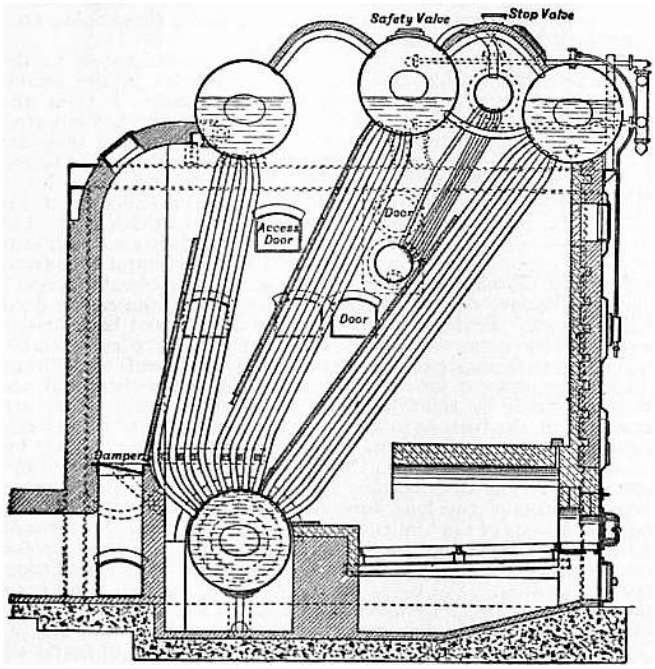


Fig. 12.—Stirling Water-tube Boiler.

The earliest form of water-tube boiler which came into general use in the British navy is the Belleville. Two views of this boiler are shown in fig. 14. It is composed of two parts, the boiler proper and the "economizer."

Belleville.

Each of these consists of several sets of elements placed side by side; those of the boiler proper are situated immediately over the fire, and those of the economizer in the uptake above the boiler, the intervening space being designed to act as a combustion chamber. Each element is constructed of a number of straight tubes connected at their ends by means of screwed joints to junction-boxes which are made of malleable cast iron. These are arranged vertically over one another, and except in the case of the upper and lower ones at the front of the boiler, each connects the upper end of one tube with the lower end of the next tube of the element. The boxes at the back of the boiler are all close-ended, but those at the front are provided with a small oval hole, opposite to each tube end, closed by an internal door with bolt and cross-bar; the purpose of these openings is to permit the inside of the tubes to be examined and cleaned. The lower front box of each element of the boiler proper is connected to a horizontal cross-tube of square section, called a "feed-collector," which extends the whole width of the boiler. When the boiler is not in use, any element can be readily disconnected and a spare one inserted. The lower part of the steam-chest is connected to the feed-collector by vertical pipes at each end of the boiler, and prolongations of these pipes below the level of the feed-collector form closed pockets for the collection of sediment. The tubes are made of seamless steel. They are generally about 4½ in. in external diameter: the two lower rows are ⅜ in. thick, the next two rows $\frac{5}{16}$ and the remainder about ⅕ in. The construction of the economizer is similar to that of the boiler proper, but the tubes are shorter and smaller, being generally about 2¾ in. in diameter. The lower boxes of the economizer elements are connected to a horizontal feed pipe which is kept supplied with water by a feed-pumping engine, and the upper boxes are connected to another horizontal pipe from which the heated feed-water is taken into the steam-chest. Both the boiler proper and the economizer are enclosed in a casing which is formed of two thicknesses of thin iron separated by non-conducting material and lined with firebrick at the part between the fire-bar level and the lower rows of tubes. Along the front of the boiler, above the level of the firing-doors, there is a small tube having several nozzles directed across the fire-grate, and supplied with compressed air at a pressure of about 10 lb. per sq. in. In this way not only is additional air supplied, but the gases issuing from the fire are stirred up and mixed, their combustion being thereby facilitated before they pass into the spaces between the tubes. A similar air-tube is provided for the space between the boiler proper and the economizer. Any water suspended in the steam is separated in a special separator fitted in the main steam-pipe, and the steam is further dried by passing through a reducing-valve, which ensures a steady pressure on the engine side of the valve, notwithstanding fluctuations of pressure in the boiler. The boiler pressure is usually maintained at about 50 lb. per sq. in. in excess of that at which the engines are working, the excess forming a reservoir of energy to provide for irregular firing or feeding.

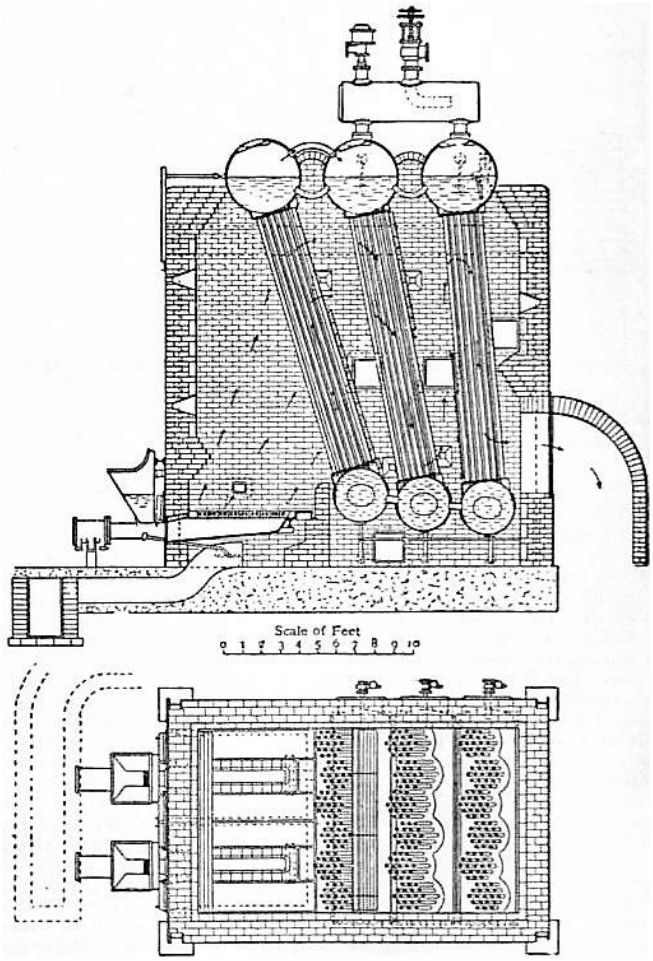


FIG. 13.—Woodeson Boiler (Messrs Clarke, Chapman & Co.).

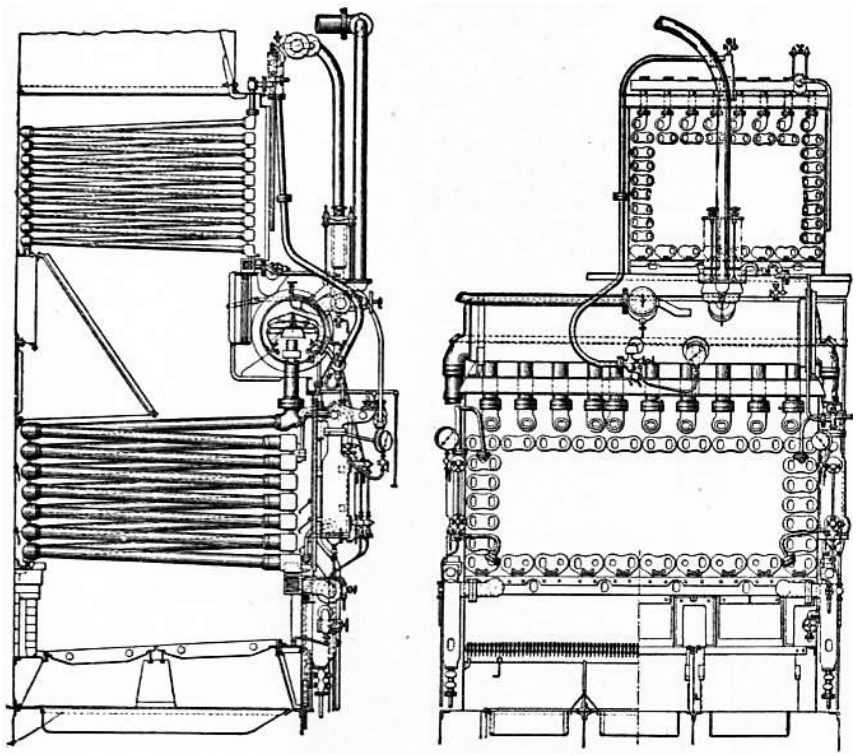


FIG. 14.—Belleville Boiler.

Another type of large-tube boiler which has been used in the British and in other navies is the "Niclausse," shown in fig. 15. It is also in use on land in several electric-light installations. It consists of a horizontal steam-chest under which is placed a number of elements arranged side by side over the fire, the whole being enclosed in an iron casing lined with firebrick where it is exposed to the direct action of the fire. Each element consists of a header of rectangular cross-section, fitted with two rows of inclined close-ended tubes, which slope downwards towards the back of the boiler with an inclination of 6° to the horizontal. The headers are usually of malleable cast iron with diaphragms cast in them, but sometimes steel has been employed, the bottoms being closed by a riveted steel plate, and the diaphragms being made of the same material. The headers are bolted to socket-pieces which are riveted to the bottom of the steam-chest, so that any element may be easily removed. The tube-holes are accurately bored, at an angle to suit the inclination of the tubes, through both the front and back of the headers and through the diaphragm, those in the header walls being slightly conical. The tubes themselves, which are made of seamless steel, are of peculiar construction. The lower or back ends are reduced in diameter and screwed and fitted with cap-nuts which entirely close them. The front ends are thickened by being upset, and the parts where they fit into the header walls and in the diaphragm are carefully turned to gauge. The upper and lower parts of the tubes between these fitting portions are then cut away, the side portions only being retained, and the end is termed a "lanterne." A small water-circulating tube of thin sheet steel, fitted inside each generating tube, is open at the lower end, and at the other is secured to a smaller "lanterne," which, however, only extends from the front of the header to the diaphragm. This smaller "lanterne" closes the front end of the generating tube. The whole arrangement is such that when the tubes are in place only the small inner circulating tubes communicate with the space between the front of the header and the diaphragm, while the annular spaces in the generating tubes around the water-circulating tubes communicate only with the space between the diaphragm and the back of the header. The steam formed in the tubes escapes from them into this back space, through which it rises into the steam-chest, whilst the space in the front of the header always contains a down-current of water supplying the inner circulating tubes. The tubes are maintained in position by cross-bars, each secured by one stud-bolt screwed into the header front wall, and each serving to fix two tubes. The products of combustion ascend directly from the fire amongst the tubes, and the combustion is rendered more complete by the introduction of jets of high-pressure air immediately over the fire, as in the "Belleville" boiler.

Niclausse.

The "Dürr" boiler, in use in several vessels in the German navy, and in a few vessels of the British navy, in some respects resembles the "Niclausse." The separate headers of the latter, however, are replaced by one large water-chamber formed of steel plates with welded joints, and instead of the tubes being secured by "lanternes" to two plates they are secured to the inner plate only by conical joints, the holes in the outer plate being closed by small round doors fitted from the inside. In fixing the tubes each is separately forced into its position by means of a small portable hydraulic jack. The lower ends of the caps are closed by cap-nuts made of a special heat-resisting alloy of copper and manganese. Circulation is provided for by a diaphragm in the water-chamber and by inner tubes as in the Niclausse boiler. Baffle plates are fitted amongst the tubes to ensure a circulation of the furnace gases amongst them. Above the main set of tubes is a smaller set arranged horizontally, and connected directly to the steam receiver. These are fitted with internal tubes, and an internal diaphragm is provided so that steam from the chest circulates through these tubes on its way to the stop-valves. This supplementary set of tubes is intended to serve as a superheater, but the amount of surface is not sufficient to obtain more than a very small amount of superheat.

Dürr.

The Yarrow boiler (fig. 16) is largely in use in the British and also in several other navies. It consists of a large cylindrical steam chest and two lower water-chambers, connected by numerous straight tubes. In the boilers for large vessels all the tubes are of 1¾ in. external diameter, but in the large express boilers the two rows nearest to the fire on each side are of 1¼ in. and the remainder of 1 in. diameter. They are arranged with their centres forming equilateral triangles, and are spaced so that they can be cleaned externally both from the front of the boiler and also cross-ways in two directions. In some boilers the lower part of the steam-chest is connected with the water-chambers by large pipes outside the casings with the view of improving the circulation.

Yarrow.

The largest size of single-ended large tube boiler in use has a steam drum 4 ft. 2 in. diameter, a grate area of 73.5 sq. ft. and 3750 sq. ft. of heating surface, but much larger double-ended boilers have been made, these being fired from both ends.

In most of the boilers made, access to the inside is obtained by manholes in the steam-chest and water-chamber ends, but in the smaller sizes fitted in torpedo boats the water-chambers are too small for this, and they are each arranged in two parts connected by a bolted joint, which makes all the tube ends accessible.

The Babcock & Wilcox marine boiler (fig. 17) is much used in the American and British navies, and it has also been used in several yachts and merchant steamers. It consists of a horizontal cylindrical steam-chest placed transversely over a group of elements, beneath which is the fire, the whole being enclosed in an iron casing lined with firebrick. Each element consists of a front and back header connected by numerous water-tubes which have a considerable inclination to facilitate the circulation. The upper ends of the front headers are situated immediately under the steam-chest and are connected to it by short nipples; by a similar means they are connected at the bottom to a pipe of square section which extends across the width of the boiler. Additional connexions are made by nearly vertical tubes between this cross-pipe and the bottom of the steam-chest. The back headers are each connected at their upper ends by means of two long horizontal tubes with the steam-chest, the bottom ends of the headers being closed. The headers are made of wrought steel, and except the outer pairs, which are flat on the outer portions, they are sinuous on both sides, the sinuosities fitting into one another. The tubes are of two sizes, the two lower rows and the return tubes between the back headers and steam-chest being $3^{15}/_{16}$ in. outside diameter, and the remaining tubes $1^{13}/_{16}$ in. The small tubes are arranged in groups of two or four to nearly all of the sinuosities of the headers, the purpose of this arrangement being to give opportunities for the furnace gases to become well mixed together, and to ensure their contact with the heating surfaces. Access for securing the tubes in the headers is provided by a hole formed on the other side of the header opposite each of the tubes, where they are grouped in fours, and by one larger hole opposite each group of two tubes. The larger holes are oval, and are closed by fittings similar to those used in the land boiler (fig. 18). The smaller holes are conical, with the larger diameter on the inside, and are closed by special conical fittings: the conical portion and bolt are one forging, and the nut is close-ended. In case of the breakage of the bolt, the fitting would be retained in place by the steam-pressure. A set of firebrick baffles is placed so as to cover rather more than half of the spaces between the upper of the two bottom rows of large tubes, and another set of baffles covers about two-thirds of the spaces between the upper small tubes. Vertical baffles are also built between the smaller tubes, as shown in the longitudinal section. These baffles compel the products of combustion to circulate among the tubes in the direction shown by the arrows. Experience has shown that this arrangement gives a better evaporative efficiency than where the furnace gases are allowed to pass unbaffled straight up between the tubes. The boilers are usually fitted in pairs placed back to back, and one side of each is always made accessible. On this side the casing is provided with numerous small doors, through any of which a steam jet can be inserted for the purpose of sweeping the tubes.

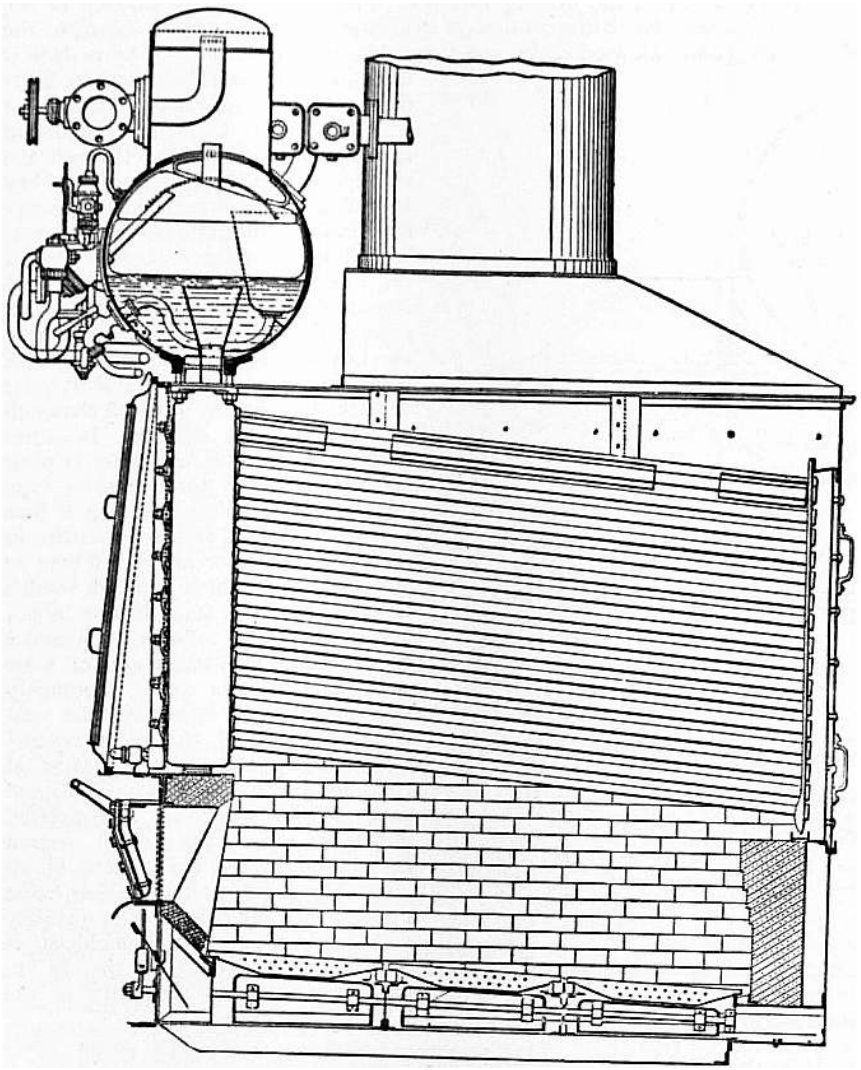


FIG. 15.—Niclausse Boiler—transverse section.

A class of water-tube boilers largely in use in torpedo-boat destroyers and cruisers, where the maximum of

power is required in proportion to the total weight of the installation, is generally known as express boilers. In these the tubes are made of smaller diameter than those used in the boilers already described, and the boilers are designed to admit of a high rate of combustion of fuel obtained by a high degree of "forced draught." Of these express boilers the Yarrow is of similar construction to the large tube Yarrow boiler already described with the exception that the tubes are smaller in diameter and much more closely arranged.

Express boilers.

In the Normand boiler (fig. 19) there are three chambers as in the Yarrow, connected together by a large number of bent tubes which form the heating surface, and also connected at each end by large outside circulating tubes. The two outer rows of heating tubes on each side are arranged to touch one another to nearly their whole length so as to form a "water-wall" for the protection of the outer casing. They enter the steam-chest at about the water-level. The two inner rows of tubes, which are bent to the form shown in the figure, also form a water-wall for the larger portion of the length of the boiler, and thus compel the products of combustion to pass in a definite course amongst all the tubes. In the Blechynden and White-Foster boilers there are also three chambers connected by bent tubes, the curvature being so arranged that in the former boiler any of the tubes can be taken out of the boiler through small doors provided in the upper part of the steam-chest, and in the White-Foster boiler they can be taken out through the manhole in the end of the steam-chest.

Normand.

In the Reed boiler the tubes are longer and more curved than in the Normand boiler, and there are no "water-walls," the products of combustion passing from the fire-grate amongst all the tubes direct to the chimney. The special feature of the boiler is that each tube, instead of being expanded into the tube plate, is fitted at each end with specially designed screw and nut connexions to enable them to be quickly taken out and replaced if necessary. At their lower ends the tubes are reduced in diameter to enable smaller chambers to be used than would otherwise be necessary. Provision is made for access to the lower tube ends by means of numerous doors in the water-chambers. Access to the top ends is obtained in the steam-chest.

Reed.

Messrs John I. Thornycroft & Co. make two forms of express boiler. One called the Thornycroft boiler consists of three chambers connected by tubes which are straight for the major portion of their length but bent at each end to enable them to enter the steam- and water-chambers normally. The outer rows of tubes form "water-walls" at their lower parts, but permit the passage of the gases between them at their upper ends. Similarly the inner rows form "water-walls" at their upper parts, but are open at the lower ends. The products of combustion are thus compelled to pass over the whole of the heating surfaces. The fire-rows of tubes in this boiler are made 1⅜ in. outside diameter and the remainder are made 1⅛ in. diameter. Large outside circulating pipes are provided at the front end of the boiler.

Thornycroft.

In the other type of boiler, known as the Thornycroft-Schulz boiler (fig. 20), there are four chambers, and the fire-grate is arranged in two separate portions. The two outermost rows of tubes on each side are arranged to form water-walls at their lower part, and permit the gases to pass between them at the upper part. The rows nearest the fires are arranged similarly to those in the Thornycroft boiler. Circulation in the outer sets of tubes is arranged for by outer circulating pipes of large diameter connecting the steam- and water-chambers. For the middle water-chamber several nearly vertical down-comers are provided in the centre of the boiler. Boilers of this type are extensively used in the British and German navies.

Thornycroft-Schulz.

Material of Boilers.—In ordinary land boilers and in marine boilers of all types the plates and stays are almost invariably made of mild steel. For the shell plates and for long stays, a quality having a tensile strength ranging from 28 to 32 tons per sq. in. is usually employed, and for furnaces and flues, for plates which have to be flanged, and for short-screwed stays, a somewhat softer steel with a strength ranging from 26 to 30 tons per sq. in. is used. The tubes of ordinary land and marine boilers are usually made of lap-welded wrought iron. In water-tube boilers for naval purposes seamless steel tubes are invariably used. In locomotive boilers the shells are generally of mild steel, the fire-box plates of copper (in America of steel), the fire-box side stays of copper or special bronze, and other stays of steel. The tubes are usually of brass with a composition either of two parts by weight of copper to one of zinc or 70% copper, 30% zinc; sometimes, however, copper tubes and occasionally steel tubes are used. Where water tubes are used they are made of seamless steel.

Boiler Accessories.—All boilers must be provided with certain mountings and accessories. The water-level in them must be kept above the highest part of the heating surfaces. In some land boilers, and in some of the water-tube boilers used on shipboard, the feeding is automatically regulated by mechanism actuated by a float, but in these cases means of regulating the feed-supply by hand are also provided. In most boilers hand regulation only is relied upon. The actual level of water in the boiler is ascertained by a glass water-gauge, which consists of a glass tube and three cocks, two communicating directly with the boiler, one above and one below the desired water-level, and the third acting as a blow-out for cleaning the gauge and for testing its working. Three small try-cocks are also fitted, one just at, one above, and one below the proper water-level. The feeding of the boiler is sometimes performed by a pump driven from the main engine, sometimes by an independent steam-pump, and sometimes by means of an injector. The feed-water is admitted by a "check-valve," the lift of which is regulated by a screw and hand-wheel, and which when the feed-pump is not working is kept on its seating by the boiler pressure.

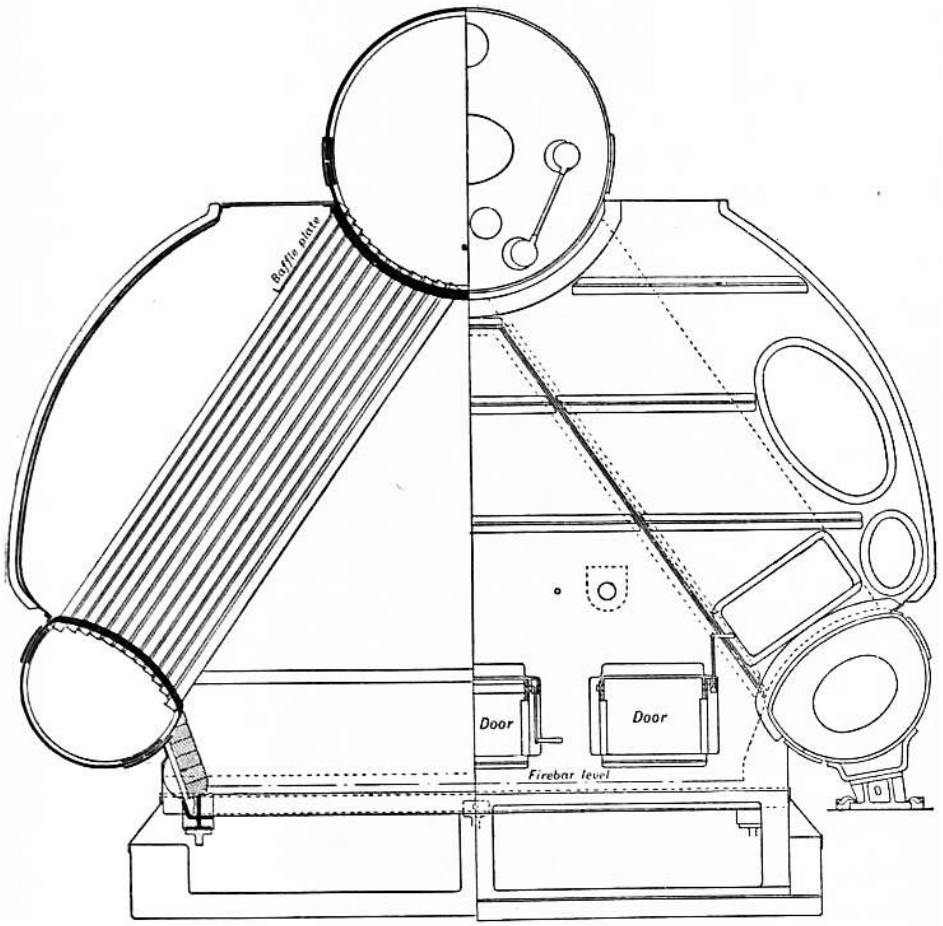


FIG. 16.—Yarrow Water-tube Boiler.

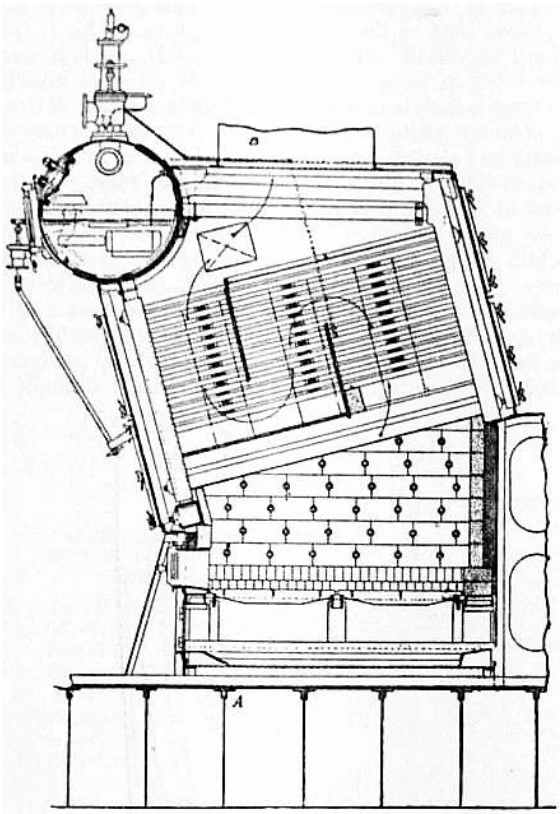
Every boiler is in addition supplied with a steam-gauge to indicate the steam-pressure, with a stop-valve for regulating the admission of steam to the steam-pipes, and with one or two safety-valves. These last in stationary boilers usually consist of valves kept in their seats against the steam-pressure in the boiler by levers carrying weights, but in marine and locomotive boilers the valves are kept closed by means of steel springs. One at least of the safety-valves is fitted with easing gear by which it can be lifted at any time for blowing off the steam. Blow-out cocks are fitted for emptying the boiler.

Openings must always be made in boilers for access for cleaning and examination. When these are large enough to allow a man to enter the boiler they are termed man-holes. They are usually made oval, as this shape permits the doors by which they are closed to be placed on the inside so that the pressure upon them tends to keep them shut. The doors are held in place by one or two bolts, secured to cross-bars or "dogs" outside the boiler. It is important in making these doors that they should fit the holes so accurately that the jointing material cannot be forced out of its proper position. In the few cases where doors are fitted outside a boiler, so that the steam-pressure tends to open them, they are always secured by several bolts so that the breakage of one bolt will not allow the door to be forced off.

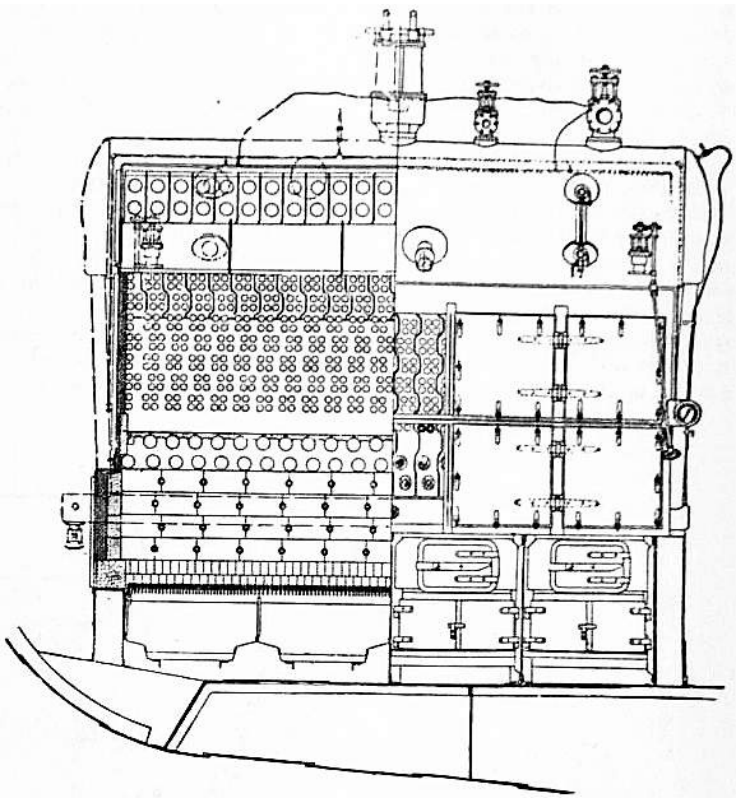
Water-softening.—Seeing that the impurities contained in the feed-water are not evaporated in the steam they become concentrated in the boiler water. Most of them become precipitated in the boiler either in the form of mud or else as scale which forms on the heating surfaces. Some of the mud and such of the impurities as remain soluble may be removed by means of the blow-off cocks, but the scale can only be removed by periodical cleaning. Incrustations on the heating surface not only lessen the efficiency of the boiler by obstructing the transmission of heat through the plates and tubes, but if excessive they become a source of considerable danger by permitting the plates to become overheated and thereby weakened. When the feed-water is very impure, therefore, the boilers used are those which permit of very easy cleaning, such as the Lancashire, Galloway and Cornish types, to the exclusion of multitubular or water-tube boilers in which thorough cleaning is more difficult. In other cases, however, the feed-water is purified by passing it through some type of "softener" before pumping it into the boiler. Most of the impurities in ordinary feed-water are either lime or magnesia salts, which although soluble in cold water are much less so in hot water. In the "softener" measured quantities of feed-water and of some chemical reagents are thoroughly mixed and at the same time the temperature is raised either by exhaust steam or by other means. Most of the impurity is thus precipitated, and some of the remainder is converted into more soluble salts which remain in solution in the boiler until blown out. The water is filtered before being pumped into the boiler. The quantity and kind of chemical employed is determined according to the nature and amount of the impurity in the "hard" feed-water.

Thermal Storage.—In some cases where the work required is very intermittent, "thermal storage" is employed. Above the boiler a large cylindrical storage vessel is placed, having sufficient capacity to contain enough feed-water to supply the boiler throughout the periods when the maximum output is required. The upper part of this storage vessel is always in free communication with the steam space of the boiler, and from the lower part of it the feed-water may be run into the boiler when required. The feed-water is delivered into the upper part of the vessel, and arrangements are made by which before it falls to the bottom of the chamber it runs over very extended surfaces exposed to the steam, its temperature being thus raised to that of the steam. At times when less than the normal supply of steam is required for the engine more than the average quantity of feed-water is pumped into the chamber, and the excess accumulates with its temperature raised to the evaporation point. When an extra supply of steam is required, the feed-pump is stopped and the boiler is fed

with the hot water stored in the chamber. Besides the “storage” effect, it is found that many of the impurities of the feed become deposited in the chamber, where they are comparatively harmless and from which they are readily removable.



Longitudinal section.



Section at AB—Front elevation.

Fig. 17.—Bobcock & Wilcox Water-tube Boiler (marine type).

Oil Separators.—When the steam from the engines is condensed and used as feed-water, as is the case with marine boilers, much difficulty is often experienced with the oil which passes over with the steam. Feed-filters are employed to stop the coarser particles of the oil, but some of the oil becomes “emulsified” or suspended in the water in such extremely minute particles that they pass through the finest filtering materials. On the evaporation of the water in the boiler, this oil is left as a thin film upon the heating surfaces, and by preventing the actual contact of water with the plates has been the cause of serious trouble. An attempt has been made to overcome the emulsion difficulty by uniformly mixing with the water a small quantity of solution of lime. On the water being raised in temperature the lime is precipitated, and the minute particles separated apparently attract the small globules of oil and become aggregated in sufficient size to deposit themselves in quiet parts of

the boiler, whence they can be occasionally removed either by blowing out or by cleaning. Much, however, still remains to be done before the oil difficulty will be thoroughly removed.

Corrosion.—When chemicals of any kind are used to soften or purify feed-water it is essential that neither they nor the products they form should have a corrosive effect upon the boiler-plates, &c. Much of the corrosion which occasionally occurs has been traced to the action of the oxygen of the air which enters the boiler in solution in the feed-water, and the best practice now provides for the delivery of the feed into the boiler at such positions that the air evolved from it as it becomes heated passes direct to the steam space without having an opportunity of becoming disengaged upon the under-water surfaces of the boiler.

Where corrosion is feared it is usual to fit zinc slabs in the water spaces of the boiler. Experience shows that it is better to make them of rolled rather than of cast zinc, and to secure them on studs which can be kept bright, so as to ensure a direct metallic contact between the zinc and the boiler-plate. The function of the zinc is to set up galvanic action; it plays the part of the negative metal, and is dissolved while the metal of the shell is kept electro-positive. Care must always be taken that the fragments which break off the zinc as it wastes away cannot fall upon the heating surfaces of the boiler.

Evaporators.—In marine boilers the waste of water which occurs from leakages in the cycle of the evaporation in the boiler, use in the engine, condensation in the condenser and return to the boiler as feed-water, is made up by fresh water distilled from sea-water in “evaporators.” Of these there are many forms with different provisions for cleaning the coils, but they are all identical in principle. They are fed with sea-water, and means are provided for blowing out the brine produced in them when some of the water is evaporated. The heat required for the evaporation is obtained from live steam from the boilers, which is admitted into coils of copper pipe. The water condensed in these coils is returned direct to the feed-water, and the steam evaporated from the sea-water is led either into the low-pressure receiver of the steam-engine or into the condenser.

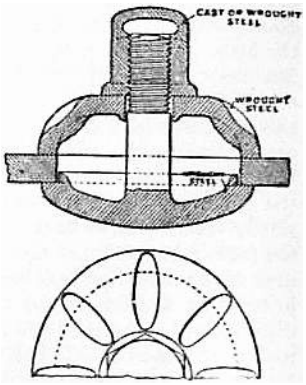


Fig. 18.—Handhole Fittings.

Efficiency of Boilers.—The useful work obtained from any boiler depends upon many considerations. For a high efficiency, that is, a large amount of steam produced in proportion to the amount of fuel consumed, different conditions have to be fulfilled from those required where a large output of steam from a given plant is of more importance than economy of fuel. For a high efficiency, completeness of combustion of fuel must be combined with sufficient heating surface to absorb so much of the heat produced as will reduce the temperature of the funnel gases to nearly that of steam. Completeness of combustion can only be obtained by admitting considerably more air to the fire than is theoretically necessary fully to oxidize the combustible portions of the fuel, and by providing sufficient time and opportunity for a thorough mixture of the air and furnace gases to take place before the temperature is lowered to that critical point below which combustion will not take place. It is generally considered that the amount of excess air required is nearly equal to that theoretically necessary; experience, however, tends to show that much less than this is really required if proper means are provided for ensuring an early complete mixture of the gases. Different means are needed to effect this with different kinds of coal, those necessary for properly burning Welsh coal being altogether unsuitable for use with North Country or Scottish coal. As all the excess air has to be raised to the same temperature as that of the really burnt gases, it follows that an excess of air passing through the fire lowers the temperature in the fire and flues, and therefore lessens the heat transmission; and as it leaves the boiler at a high temperature it carries off some of the heat produced. A reduction of the amount of air, therefore, may, by increasing the fire temperature and lessening the chimney waste, actually increase the efficiency even if at the same time it is accompanied by a slight incompleteness of combustion.

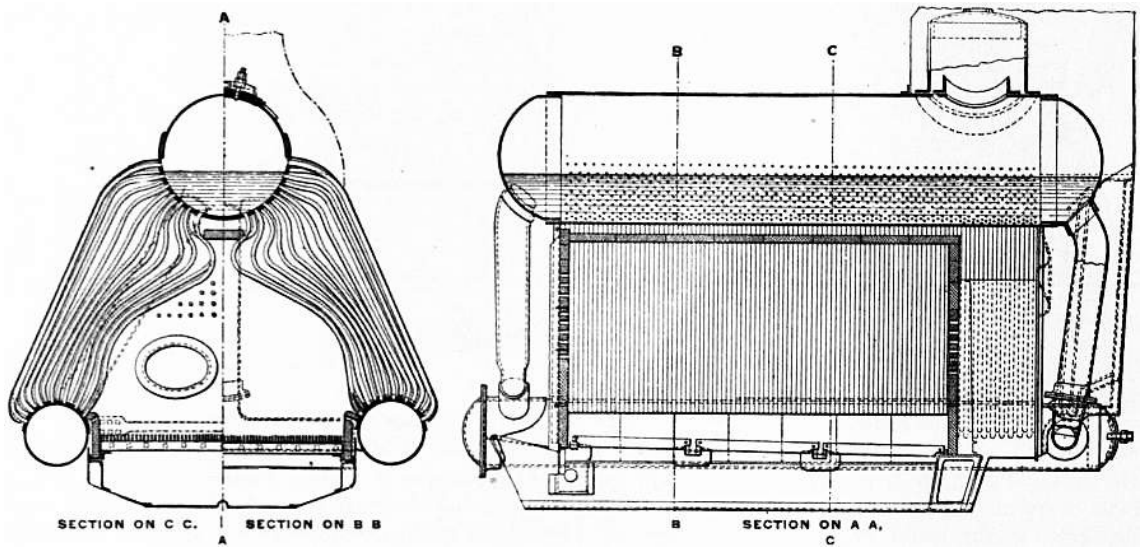


Fig. 19.—Normand Boiler.

Mechanical Stoking.—Most boilers are hand-fired, a system involving much labour and frequent openings of the furnace doors, whereby large quantities of cold air are admitted above the fires. Many systems of mechanical stoking have been tried, but none has been found free from objections. That most usually employed is known as the “chain-grate” stoker. In this system, which is illustrated in fig. 13 (Woodeson boiler), the grate consists of a wide endless chain formed of short cast-iron bars; this passes over suitable drums at the front and back of the boiler, by the slow rotation of which the grate travels very slowly from front to back. The coal,

which is broken small, is fed from a hopper over the whole width of the grate, the thickness of the fire being regulated by a door which can be raised or lowered as desired. Thus the volatile portions of the coal are distilled at the front of the fire, and pass over the incandescent fuel at the back end. The speed of travel is so regulated that by the time the remaining parts of the fuel reach the back end the combustion is nearly complete. It will be seen that the fire becomes thinner towards the back, and too much air is prevented from entering the thin portion by means of vanes actuated from the front of the boiler.

Draught.—In most boilers the draught necessary for combustion is "natural," *i.e.* produced by a chimney. For marine purposes, although "natural" draught is the more common, many boiler installations are fitted with "forced" draught arrangements. Two distinct systems are used. In that known as the "closed stokehold" the stokehold compartment of the vessel is so closed that the only exit for air from it is through the fires. Air is driven into the stokehold by means of fans which are made so that they can maintain an air pressure in the stokehold above that of the outside atmosphere. This is the system almost universally adopted in war vessels, and it is used also in some fast passenger ships. The air pressure usually adopted in large vessels is that corresponding to a height of from 1 to 1½ in. of water, whilst so much as 4 in. is sometimes used in torpedo-boats and similar craft. This is, of course, in addition to the chimney-draught due to the height of the funnel. In the closed ashpit or Howden system, the stokehold is open, and fans drive the air round a number of tubes, situated in the uptake, through which the products of combustion pass on their way to the chimney. The air thus becomes heated, and part of it is then delivered into the ashpit below the fire and part into a casing round the furnace front from which it enters the furnace above the fire. In locomotive boilers the draught is produced by the blast or the exhaust steam. With natural draught a combustion of about 15 to 20 ℔ of coal per sq. ft. of grate area per hour can be obtained. With forced draught much greater rates can be maintained, ranging from 20 ℔ to 35 ℔ in the larger vessels with a moderate air pressure, to as much as 70 and even 80 ℔ per sq. ft. in the express types of boiler used in torpedo boats and similar craft.

Performance of Boilers.—The makers of several types of boilers have published particulars regarding the efficiency of the boilers they construct, but naturally these results have been obtained under the most favourable circumstances which may not always represent the conditions of ordinary working. The following table of actual results of marine boiler trials, made at the instance of the British admiralty, is particularly useful because the trials were made with great care under working conditions, the whole of the coal being weighed and the feed-water measured throughout the trials by skilled observers. The various trials can be compared amongst themselves as South Welsh coal of excellent quality was used in all cases.

In experimental tests such as those above referred to, many conditions have to be taken into account, the principal being the duration of the trial. It is essential that the condition of the boiler at the conclusion of the test should be precisely the same as at the commencement, both as regards the quantity of unconsumed coals on the fire-grate and the quantity of water and the steam-pressure in the boiler. The longer the period over which the observations are taken the less is the influence of errors in the estimation of these particulars. 151 Further, in order properly to represent working conditions, the rate of combustion of the fuel throughout the trial must be the same as that intended to be used in ordinary working, and the duration of the test must be sufficient to include proportionately as much cleaning of fires as would occur under the normal working conditions. The tests should always be made with the kind of coal intended to be generally used, and the records should include a test of the calorific value of a sample of the fuel carefully selected so as fairly to represent the bulk of the coal used during the trial. The periodic records taken are the weights of the fuel used and of the ashes, &c., produced, the temperature and quantity of the feed-water, the steam pressure maintained, and the wetness of the steam produced. This last should be ascertained from samples taken from the steam pipe at a position where the full pressure is maintained. In order to reduce to a common standard observations taken under different conditions of feed temperatures and steam pressures, the results are calculated to an equivalent evaporation at the atmospheric pressure from a feed temperature of 212° F.

(J. T. Mi.)

Trials of Various Types of Marine Boilers

Description of Boiler.	Grate Area sq. ft.	Heating Surface sq. ft.	Duration of Trial Hours.	Coal burned Per sq. ft. of Grate per Hour.	Air Pressure in Stoke-hold—Inches of Water.	Chimney Draught—Inches of Water	Water Evaporated per ℔ of Coal.		Water Evaporated per sq. ft. of Heating Surface.	Thermal Units per ℔ of coal.	Efficiency of Boiler %
							Actual	From and at 212° F.			
							℔	℔	℔		
Ordinary cylindrical single-ended; 3 furnaces; 155 ℔ working pressure; closed stokehold system.*	81	2308	25	14.2	Nil	0.36	8.56	10.26	4.26	14,267	69
	”	”	24	13.9	”	0.50	8.84	10.33	4.32	14,697	68
	”	”	9	30.3	0.81	0.39	7.93	9.27	8.46	14,686	61
	”	”	8½	29.1	0.65	0.32	8.84	10.34	9.05	14,612	68
Ordinary cylindrical single-ended; 3 furnaces; 210 ℔ working pressure; closed ashpit, Howden system.**	63.2	2876 in boiler, 766 in air heaters	13	20.6	In Ash-pit 1.53	0.58	11.30	12.33	5.14	14,475	82
Niclausse water-tube; 160 ℔ working pressure.	46	1322	8	12.8	Nil	0.20	8.41	10.15	3.75	14,680	66
	”	”	8	21.9	”	0.20	8.01	9.40	6.11	14,760	62
	”	”	37	20.2	”	0.29	7.62	9.00	5.44	14,600	60
Niclausse water-tube; 250 ℔ working pressure.	34	990	9	14.0	0.10	0.23	8.77	10.50	4.17	14,640	69
	”	”	9	22.0	0.27	0.23	7.68	9.06	5.74	14,640	60
	”	”	90	15.4	Nil	Not ascertained	7.61	9.08	4.00	14,630	59
Babcock water-tube; 3 3/16 in. tubes; 260 ℔ working pressure.	36	1010	9	13.0	”	0.26	9.31	11.02	4.30	14,590	73
	”	”	9	20.0	0.18	0.20	8.58	10.11	6.13	14,590	67
	”	”	90	14.5	Nil	Not ascertained	8.09	9.53	4.18	..	63
	62	2167	28	18.4	”	0.45	8.94	10.61	4.61	14,520	70
	”	”	24	19.2	”	0.47	8.93	10.59	4.82	14,390	71

Babcock water-tube; 1 13/16 in. tubes; 270 lb working pressure.***	”	”	12	20.5	”	0.42	9.42	11.04	5.41	14,080	75
	”	”	7	28.9	0.50	Not ascertained	8.54	9.88	6.91	14,390	66
	”	”	30	19.9	Nil	0.38	10.11	12.00	6.01	14,530	79
	”	”	29	27.1	0.66	0.23	9.96	11.67	8.05	14,630	77
Belleville water-tube with economizers; 320 lb working pressure.	44	910 in boiler; 447 in economizer; 1357 total.	24½	15.8	Nil	0.36	9.65	11.46	4.94	14,697	77
	”		24	17.4	”	0.39	9.33	11.00	5.30	14,805	71
	”		11	19.8	”	0.43	9.39	11.03	6.38	14,578	73
	”		8	27.2	”	0.39	8.28	9.79	7.78	14,611	65
Yarrow water tube; 1¾ in. tubes; 250 lb working pressure.	56	2896	26	16.9	Nil	0.31	9.57	11.45	3.12	14,750	75
	”	”	26	18.2	”	0.31	9.37	11.33	3.30	14,500	75
	”	”	25	21.3	”	0.31	8.83	10.45	3.63	13,500	75
	”	”	30	35.4	0.53	0.26	8.82	10.59	6.04	14,430	70
	”	”	8	41.9	0.86	0.31	8.24	9.94	6.69	14,500	66
	”	”	8	33.7	0.31	0.30	8.39	9.93	5.47	14,680	65
	”	”	8	39.8	0.82	0.24	8.85	10.43	6.81	14,530	69
Dürr water-tube; 250 lb working pressure.	71	2671 in boiler, 140 in superheater; 2811 total.	26	16.1	Nil	0.39	7.95	9.50	3.24	14,500	63
	”		26	17.7	”	0.30	7.06	9.28	3.43	14,620	61
	”		25	21.1	”	0.31	7.62	9.08	4.05	14,650	60
	”		7	33.8	0.70	0.36	7.72	9.29	6.59	14,570	62
	”		8	26.7	0.33	0.35	7.86	9.26	5.30	14,320	63
	”		8	34.6	1.11	0.20	8.02	9.53	7.02	14,230	64
	”		22	34.8	0.73	0.16	6.84	8.06	6.02	14,430	54
	”		24	29.9	0.35	0.12	7.62	9.00	5.75	14,240	61
	”		20	19.9	Nil	0.21	7.30	8.33	3.66	14,240	8.

* In the first three trials no retarders were used in the tubes. In the last trial retarders were used.

** In this trial retarders were used in the tubes.

*** The first four trials were made with horizontal baffles above the tubes; the last two trials with the baffling described in the text.

Boiler Making

The practice of the boiler, bridge and girder shops may here be conveniently treated together, because similar materials and methods are employed in each, notwithstanding that many points of divergence in practice generally relegate them to separate departments. The materials used are chiefly iron and steel. The methods mostly adopted are those involved in the working of plates and rolled sections, which vastly predominate over the bars and rods used chiefly in the smithy. But there are numerous differences in methods of construction. Flanging occupies a large place in boilermaking, for end-plates, tube-plates, furnace flues, &c., but is scarcely represented in bridge and girder work. Plates are bent to cylindrical shapes in boilermaking, for shells and furnaces, but not in girder work. Welding is much more common in the first than in the second, furnace flues being always welded and stand pipes frequently. In boiler work holes are generally drilled through the seams of adjacent plates. In bridge work each plate or bar is usually drilled or punched apart from its fellows. Boilers, again, being subject to high temperatures and pressures, must be constructed with provisions to ensure some elasticity and freedom of movement under varying temperatures to prevent fractures or grooving, and must be made of materials that combine high ductility with strength when heated to furnace temperatures. Flanging of certain parts, judicious staying, limitation of the length of the tubes, the forms of which are inherently weak, provide for the first; the selection of steel or iron of high percentage elongation, and the imposition of temper, or bending tests, both hot and cold, provide for the second.

The following are the leading features of present-day methods.

It might be hastily supposed that, because plates, angles, tees, channels and joist sections are rolled ready for use, little work could be left for the plater and boilermaker. But actually so much is involved that subdivisions of tasks are numerous; the operations of templet-making, rolling, planing, punching and shearing, bending, welding and forging, flanging, drilling, riveting, caulking, and tubing require the labours of several groups of machine attendants, and of gangs of unskilled labourers or helpers. Some operations also have to be done at a red or white heat, others cold. To the first belong flanging and welding, to the latter generally all the other operations. Heating is necessary for the rolling of tubes of small diameter; bending is done cold or hot according to circumstances.

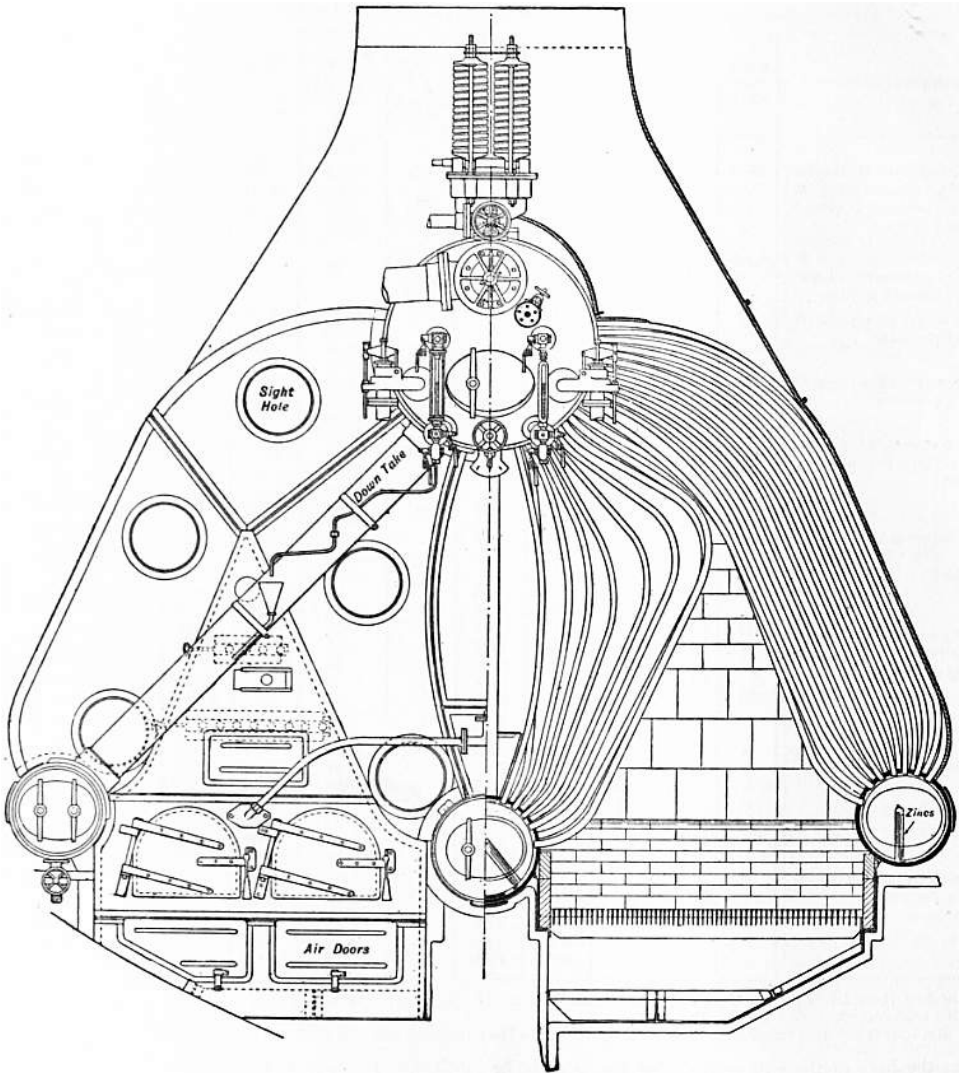


Fig. 20.—Thornycroft-Schulz Water-tube Boiler.

The fact that some kinds of treatment, as shearing and punching, flanging and bending, are of a very violent character explains why practice has changed radically in regard to the method of performing these operations in cases where safety is a cardinal matter. Shearing and punching are both severely detrusive operations performed on cold metal; both leave jagged edges and, as experience has proved, very minute cracks, the tendency of which is to extend under subsequent stress, with liability to produce fracture. But it has been found that, when a shorn edge is planed and a punched hole enlarged by reamering, no harm results, provided not less than about $\frac{1}{16}$ in. is removed. A great advance was therefore made when specifications first insisted on the removal of the rough edges before the parts were united.

In the work of riveting another evil long existed. When holes are punched it is practically impossible to ensure the exact coincidence of holes in different plates which have to be brought together for the purpose of riveting. From this followed the use of the drift,—a tapered rod driven forcibly by hammer blows through corresponding holes in adjacent plates, by which violent treatment the holes were forcibly drawn into alignment. This drifting stressed the plates, setting up permanent strains and enlarging incipient cracks, and many boiler explosions have been clearly traceable to the abuse of this tool. Then, next, specifications insisted that all holes should be enlarged by reamering *after* the plates were in place. But even that did not prove a safeguard, because it often happened that the metal reamered was nearly all removed from one side of a hole, so leaving the other side just as the punch had torn it. Ultimately came the era of drilling rivet-holes, to which there is no exception now in high-class boiler work. For average girder and bridge work the practice of punching and reamering is still in use, because the conditions of service are not so severe as are those in steam boilers.

Flanging signifies the turning or bending over of the edges of a plate to afford a means of union to other plates. Examples occur in the back end-plates of Lancashire and Cornish boilers, the front and back plates of marine boilers, the fire-boxes of locomotive boilers, the crowns of vertical boilers, the ends of conical cross-tubes, and the Adamson seams of furnace flues. This practice has superseded the older system of effecting union by means of rings forming two sides of a rectangular section (angle iron rings). These were a fruitful source of grooving and explosions in steam boilers, because their sharp angular form lacked elasticity; hence the reason for the substitution of a flange turned with a large radius, which afforded the elasticity necessary to counteract the effects of changes in temperature. In girder work where such conditions do not exist, the method of union with angles is of course retained. In the early days of flanging the process was performed in detail by a skilled workman (the angle ironsmith), and it is still so done in small establishments. A length of edge of about 10 in. or a foot is heated, and bent by hammering around the edge of a block of iron of suitable shape. Then another “heat” is taken and flanged, and another, until the work is complete. But in modern boiler shops little hand work is ever done; instead, plates 4 ft., 6 ft., or 8 ft. in diameter, and fire-box plates for locomotive boilers, have their entire flanges bent at a single squeeze between massive dies in a hydraulic press. In the case of the ends of marine boilers which are too large for such treatment, a special form of press bends the edges over in successive heats. The flanges of Adamson seams are rolled over in a special machine. A length of flue is rotated on a table, while the flange is turned over within a minute between revolving rollers. There is another advantage in the adoption of machine-flanging, besides the enormous saving of time, namely, that the material suffers far less injury than it does in hand-flanging.

These differences in practice would not have assumed such magnitude but for the introduction of mild steel in place of malleable iron. Iron suffers less from overheating and irregular heating than does steel. Steel possesses higher ductility, but it is also more liable to develop cracks if subjected to improper treatment. All this and much more is writ large in the early testing of steel, and is reflected in present-day practice.

A feature peculiar to the boiler and plating shops is the enormous number of rivet holes which have to be made, and of rivets to be inserted. These requirements are reflected in machine design. To punch or drill holes singly is too slow a process in the best practice, and so machines are made for producing many holes simultaneously. Besides this, the different sections of boilers are drilled in machines of different types, some for shells, some for furnaces, some peculiar to the shells or furnaces of one type of boilers, others to those of another type only. And generally now these machines not only drill, but can also be adjusted to drill to exact pitch, the necessity thus being avoided of marking out the holes as guides to the drills.

Hand-riveting has mostly been displaced by hydraulic and pneumatic machines, with resulting great saving in cost, and the advantage of more trustworthy and uniform results. For boiler work, machines are mostly of fixed type; for bridge and girder work they are portable, being slung from chains and provided with pressure water or compressed air by systems of flexible pipes.

Welding fills a large place in boiler work, but it is that of the edges of plates chiefly, predominating over that of the bars and rods of the smithy. The edges to be united are thin and long, so that short lengths have to be done in succession at successive “heats.” Much of this is hand work, and “gluts” or insertion pieces are generally preferred to overlapping joints. But in large shops, steam-driven power hammers are used for closing the welds. Parts that are commonly welded are the furnace flues, the conical cross-tubes and angle rings.

Another aspect of the work of these departments is the immense proportions of the modern machine tools used. This development is due in great degree to the substitution of steel for iron. The steel shell-plates of the largest boilers are 1½ in. thick, and these have to be bent into cylindrical forms. In the old days of iron boilers the capacity of rolls never exceeded about ¾ in. plate. Often, alternatively to rolling, these thick plates are bent by squeezing them in successive sections between huge blocks operated by hydraulic pressure acting on toggle levers. And other machines besides the rolls are made more massive than formerly to deal with the immense plates of modern marine boilers.

The boiler and plating shops have been affected by the general tendency to specialize manufactures. Firms have fallen into the practice of restricting their range of product, with increase in volume. The time has gone past when a single shop could turn out several classes of boilers, and undertake any bridge and girder work as well. One reason is to be found in the diminution of hand work and the growth of the machine tool. Almost every distinct operation on every section of a boiler or bridge may now be accomplished by one of several highly specialized machines. Repetitive operations are provided for thus, and by a system of templeting. If twenty or fifty similar boilers are made in a year, each plate, hole, flange or stay will be exactly like every similar one in the set. Dimensions of plates will be marked from a sample or templet plate, and holes will be marked similarly; or in many cases they are not marked at all, but pitched and drilled at once by self-acting mechanism embodied in drilling machines specially designed for one set of operations on one kind of plate. Hundreds of bracing bars for bridges and girders will be cut off all alike, and drilled or punched from a templet bar, so that they are ready to take their place in bridge or girder without any adjustments or fitting.

(J. G. H.)

BOILING TO DEATH, a punishment once common both in England and on the continent. The only extant legislative notice of it in England occurs in an act passed in 1531 during the reign of Henry VIII., providing that convicted poisoners should be boiled to death; it is, however, frequently mentioned earlier as a punishment for coining. The *Chronicles of the Grey Friars* (published by the Camden Society, 1852) have an account of boiling for poisoning at Smithfield in the year 1522, the man being fastened to a chain and lowered into boiling water several times until he died. The preamble of the statute of Henry VIII. (which made poisoning treason) in 1531 recites that one Richard Roose (or Coke), a cook, by putting poison in some food intended for the household of the bishop of Rochester and for the poor of the parish of Lambeth, killed a man and woman. He was found guilty of treason and sentenced to be boiled to death without benefit of clergy. He was publicly boiled at Smithfield. In the same year a maid-servant for poisoning her mistress was boiled at King’s Lynn. In 1542 Margaret Davy, a servant, for poisoning her employer, was boiled at Smithfield. In the reign of Edward VI., in 1547, the act was repealed.

See also W. Andrews, *Old Time Punishments* (Hull, 1890); *Notes and Queries*, vol. i. (1862), vol. ix. (1867); Du Cange (*s.v. Caldariis decoquere*).

BOIS BRÛLÉS, or Brulés (a French translation of their Indian name Sichangu), a sub-tribe of North American Dakota Indians (Teton river division). The name is most frequently associated with the half-breeds in Manitoba, who in 1869 came into temporary prominence in connexion with Riel’s Rebellion (see Red River); at that time they had lost all tribal purity, and were alternatively called *Metis* (half-castes), the majority being descendants of French-Canadians.

BOISÉ, a city and the county-seat of Ada county, Idaho, U.S.A., and the capital of the state, situated on the N. side of the Boisé river, in the S.W. part of the state, at an altitude of about 2700 ft. Pop. (1890) 2311; (1900) 5957; (1910) 17,358. It is served by the Oregon Short Line railway, being the terminus of a branch connecting with the main line at Nampa, about 20 m. W.; and by electric lines connecting with Caldwell and Nampa. The principal buildings are the state capitol, the United States assay office, a Carnegie library, a natatorium, and the Federal building, containing the post office, the United States circuit and district court rooms, and a U.S. land office. Boisé is the seat of the state school for the deaf and blind (1906), and just outside the city limits are the state soldiers' home and the state penitentiary. About 2 m. from the city are Federal barracks. Hot water (175° F.) from artesian wells near the city is utilized for the natatorium and to heat many residences and public buildings. The Boisé valley is an excellent country for raising apples, prunes and other fruits. The manufactured products of the city are such as are demanded by a mining country, principally lumber, flour and machine-shop products. Boisé is the trade centre of the surrounding fruit-growing, agricultural and mining country, and is an important wool market. The oldest settlement in the vicinity was made by the Hudson's Bay Fur Company on the west side of the Boisé river, before 1860; the present city, chartered in 1864, dates from 1863. After 1900 the city grew very rapidly, principally owing to the great irrigation schemes in southern Idaho; the water for the immense Boisé-Payette irrigation system is taken from the Boisé, 8 m. above the city. (See Idaho.)

BOISGOBEY, FORTUNÉ DU (1824-1891), French writer of fiction, whose real surname was Castille, was born at Granville (Manche) on the 11th of September 1824. He served in the army pay department in Algeria from 1844 to 1848, and extended his travels to the East. He made his literary debut in the *Petit journal* with a story entitled *Deux comédiens* (1868). With *Le Forçat colonel* (1872) he became one of the most popular feuilleton writers. His police stories, though not so convincing as those of Émile Gaboriau, with whom his name is generally associated, had a great circulation, and many of them have been translated into English. Among his stories may be mentioned: *Les Mystères du nouveau Paris* (1876), *Le Demi-Monde sous la Terreur* (1877), *Les Nuits de Constantinople* (1882), *Le Cri du sang* (1885), *La Main froide* (1889). Boisgobey died on the 26th of February 1891.

BOISGUILBERT, PIERRE LE PESANT, Sieur de (1676-1714), French economist, was born at Rouen of an ancient noble family of Normandy, allied to that of Corneille. He received his classical education in Rouen, entered the magistracy and became judge at Montivilliers, near Havre. In 1690 he became president of the *bailliage* of Rouen, a post which he retained almost until his death, leaving it to his son. In these two situations he made a close study of local economic conditions, personally supervising the cultivation of his lands, and entering into relations with the principal merchants of Rouen. He was thus led to consider the misery of the people under the burden of taxation. In 1695 he published his principal work, *Le Détail de la France; la cause de la diminution de ses biens, et la facilité du remède*.... In it he drew a picture of the general ruin of all classes of Frenchmen, caused by the bad economic régime. In opposition to Colbert's views he held that the wealth of a country consists, not in the abundance of money which it possesses but in what it produces and exchanges. The remedy for the evils of the time was not so much the reduction as the equalization of the imposts, which would allow the poor to consume more, raise the production and add to the general wealth. He demanded the reform of the *taille*, the suppression of internal customs duties and greater freedom of trade. In his *Factum de la France*, published in 1705 or 1706, he gave a more concise *résumé* of his ideas. But his proposal to substitute for all aides and customs duties a single capitation tax of a tenth of the revenue of all property was naturally opposed by the farmers of taxes and found little support. Indeed his work, written in a diffuse and inelegant style, passed almost unnoticed. Saint Simon relates that he once asked a hearing of the comte de Pontchartrain, saying that he would at first believe him mad, then become interested, and then see he was right. Pontchartrain bluntly told him that he did think him mad, and turned his back on him. With Michel de Chamillart, whom he had known as intendant of Rouen (1689-1690), he had no better success. Upon the disgrace of Vauban, whose *Dîme royale* had much in common with Boisguilbert's plan, Boisguilbert violently attacked the controller in a pamphlet, *Supplément au détail de la France*. The book was seized and condemned, and its author exiled to Auvergne, though soon allowed to return. At last in 1710 the controller-general, Nicolas Desmarets, established a new impost, the "tenth" (*dixième*), which had some analogy with the project of Boisguilbert. Instead of replacing the former imposts, however, Desmarets simply added his *dixième* to them; the experiment was naturally disastrous, and the idea was abandoned.

In 1712 appeared a *Testament politique de M. de Vauban*, which is simply Boisguilbert's *Détail de la France*. Vauban's *Dîme royale* was formerly wrongly attributed to him. Boisguilbert's works were collected by Daire in the first volume of the *Collection des grands économistes*. His letters are in the *Correspondance des contrôleurs généraux*, vol. i., published by M. de Boislisle.

BOISROBERT, FRANÇOIS LE METEL DE (1592-1662), French poet, was born at Caen in 1592. He was trained for the law, and practised for some time at the bar at Rouen. About 1622 he went to Paris, and by the next year had established a footing at court, for he had a share in the ballet of the *Bacchanales* performed at the Louvre in February. He accompanied an embassy to England in 1625, and in 1630 visited Rome, where he

won the favour of Urban VIII. by his wit. He took orders, and was made a canon of Rouen. He had been introduced to Richelieu in 1623, and by his humour and his talent as a raconteur soon made himself indispensable to the cardinal. Boisrobert became one of the five poets who carried out Richelieu's dramatic ideas. He had a passion for play, and was a friend of Ninon de l'Enclos; and his enemies found ready weapons against him in the undisguised looseness of his life. He was more than once disgraced, but never for long, although in his later years he was compelled to give more attention to his duties as a priest. It was Boisrobert who suggested to Richelieu the plan of the Academy, and he was one of its earliest and most active members. Rich as he was through the benefices conferred on him by his patron, he was liberal to men of letters. After the death of Richelieu, he attached himself to Mazarin, whom he served faithfully throughout the Fronde. He died on the 30th of March 1662. He wrote a number of comedies, to one of which, *La Belle Plaideuse*, Molière's *L'Avare* is said to owe something; and also some volumes of verse. The licentious *Contes*, published under the name of his brother D'Ouville, are often attributed to him.

BOISSARD, JEAN JACQUES (1528-1602), French antiquary and Latin poet, was born at Besançon. He studied at Louvain; but, disgusted by the severity of his master, he secretly left that seminary, and after traversing a great part of Germany reached Italy, where he remained several years and was often reduced to great straits. His residence in Italy developed in his mind a taste for antiquities, and he soon formed a collection of the most curious monuments from Rome and its vicinity. He then visited the islands of the Archipelago, with the intention of travelling through Greece, but a severe illness obliged him to return to Rome. Here he resumed his favourite pursuits with great ardour, and having completed his collection, returned to his native country; but not being permitted to profess publicly the Protestant religion, which he had embraced some time before, he withdrew to Metz, where he died on the 30th of October 1602. His most important works are: *Poemata* (1574); *Emblemata* (1584); *Icones Virorum Illustrium* (1597); *Vitae et Icones Sultanorum Turcicorum*, &c. (1597); *Theatrum Vitae Humanae* (1596); *Romanae Urbis Topographia* (1597-1602), now very rare; *De Divinatione et Magicis Praestigiis* (1605); *Habitus Variarum Orbis Gentium* (1581), ornamented with seventy illuminated figures.

BOISSIER, MARIE LOUIS ANTOINE GASTON (1823-1908), French classical scholar, and secretary of the French Academy, was born at Nimes on the 15th of August 1823. The Roman monuments of his native town very early attracted Gaston Boissier to the study of ancient history. He made epigraphy his particular theme, and at the age of twenty-three became a professor of rhetoric at Angoulême, where he lived and worked for ten years without further ambition. A travelling inspector of the university, however, happened to hear him lecture, and Boissier was called to Paris to be professor at the Lycée Charlemagne. He began his literary career by a thesis on the poet Attius (1857) and a study on the life and work of M. Terentius Varro (1861). In 1861 he was made professor of Latin oratory at the Collège de France, and he became an active contributor to the *Revue des deux mondes*. In 1865 he published *Cicéron et ses amis* (Eng. trans, by A.D. Jones, 1897), which has enjoyed a success such as rarely falls to the lot of a work of erudition. In studying the manners of ancient Rome, Boissier had learned to re-create its society and to reproduce its characteristics with exquisite vivacity. In 1874 he published *La Religion romaine d'Auguste aux Antonins* (2 vols.), in which he analysed the great religious movement of antiquity that preceded the acceptance of Christianity. In *L'Opposition sous les Césars* (1875) he drew a remarkable picture of the political decadence of Rome under the early successors of Augustus. By this time Boissier had drawn to himself the universal respect of scholars and men of letters, and on the death of H.J.G. Patin, the author of *Études sur les tragiques grecs*, in 1876, he was elected a member of the French Academy, of which he was appointed perpetual secretary in 1895.

His later works include *Promenades archéologiques: Rome et Pompéi* (1880; second series, 1886); *L'Afrique romaine, promenades archéologiques* (1901); *La Fin du paganisme* (2 vols., 1891); *Le Conjuration de Catilina* (1905); *Tacite* (1903, Eng. trans, by W.G. Hutchison, 1906). He was a representative example of the French talent for lucidity and elegance applied with entire seriousness to weighty matters of literature. Though he devoted himself mainly to his great theme, the reconstruction of the elements of Roman society, he also wrote monographs on *Madame de Sévigné* (1887) and *Saint-Simon* (1892). He died in June 1908.

BOISSONADE DE FONTARABIE, JEAN FRANÇOIS (1774-1857), French classical scholar, was born at Paris on the 12th of August 1774. In 1792 he entered the public service during the administration of General Dumouriez. Driven from it in 1795, he was restored by Lucien Bonaparte, during whose time of office he served as secretary to the prefecture of the Upper Marne. He then definitely resigned public employment and devoted himself to the study of Greek. In 1809 he was appointed deputy professor of Greek at the faculty of letters at Paris, and titular professor in 1813 on the death of P.H. Larcher. In 1828 he succeeded J.B. Gail in the chair of Greek at the Collège de France. He also held the offices of librarian of the Bibliothèque du Roi, and of perpetual secretary of the Académie des Inscriptions. He died on the 8th of September 1857. Boissonade chiefly devoted his attention to later Greek literature: Philostratus, *Heroica* (1806) and *Epistolae* (1842); Marinus, *Vita procli* (1814); Tiberius Rhetor, *De Figuris* (1815); Nicetas Eugenianus, *Drosilla et Charicles* (1819); Herodian, *Partitiones* (1819); Aristaenetus, *Epistolae* (1822); Eunapius, *Vitae Sophistarum* (1822); Babrius, *Fables* (1844);

Tzetzes, *Allegoriae Iliados* (1851); and a *Collection of Greek Poets* in 24 vols. The *Anecdota Graeca* (1829-1833) and *Anecdota Nova* (1844) are important for Byzantine history and the Greek grammarians.

A selection of his papers was published by F. Colincamp, *Critique littéraire sous le premier Empire* (1863), vol. i. of which contains a complete list of his works, and a "Notice Historique sur Monsieur B.," by Naudet.

BOISSY D'ANGLAS, FRANÇOIS ANTOINE DE (1756-1828), French statesman, received a careful education and busied himself at first with literature. He had been a member of several provincial academies before coming to Paris, where he purchased a position as advocate to the parlement. In 1789 he was elected by the third estate of the *sénéchaussée* of Annonay as deputy to the states-general. He was one of those who induced the states-general to proclaim itself a National Assembly on the 17th of June 1789; approved, in several speeches, of the capture of the Bastille and of the taking of the royal family to Paris (October 1789); demanded that strict measures be taken against the royalists who were intriguing in the south of France, and published some pamphlets on finance. During the Legislative Assembly he was *procureur-syndic* for the directory of the department of Ardeche. Elected to the Convention, he sat in the centre, "*le Marais*," voting in the trial of Louis XVI. for his detention until deportation should be judged expedient for the state. He was then sent on a mission to Lyons to investigate the frauds in connexion with the supplies of the army of the Alps. During the Terror he was one of those deputies of the centre who supported Robespierre; but he was gained over by the members of the Mountain hostile to Robespierre, and his support, along with that of some other leaders of the *Marais*, made possible the 9th Thermidor. He was then elected a member of the Committee of Public Safety and charged with the superintendence of the provisioning of Paris. He presented the report supporting the decree of the 3rd Ventose of the year III. which established liberty of worship. In the critical days of Germinal and of Prairial of the year III. he showed great courage. On the 12th Germinal he was in the tribune, reading a report on the food supplies, when the hall of the Convention was invaded by the rioters, and when they withdrew he quietly continued where he had been interrupted. On the 1st Prairial he presided over the Convention, and remained unmoved by the insults and menaces of the insurgents. When the head of the deputy, Jean Féraud, was presented to him on the end of a pike, he saluted it impassively. He was reporter of the committee which drew up the constitution of the year III., and his report shows keen apprehension of a return of the Reign of Terror, and presents reactionary measures as precautions against the re-establishment of "tyranny and anarchy." This report, the proposal that he made (August 27, 1795) to lessen the severity of the revolutionary laws, and the eulogies he received from several Paris sections suspected of disloyalty to the republic, resulted in his being obliged to justify himself (October 15, 1795). As a member of the Council of the Five Hundred he became more and more suspected of royalism. He presented a measure in favour of full liberty for the press, which at that time was almost unanimously reactionary, protested against the outlawry of returned *émigrés*, spoke in favour of the deported priests and attacked the Directory. Accordingly he was proscribed on the 18th Fructidor, and lived in England until the Consulate. In 1801 he was made a member of the Tribunate, and in 1805 a senator. In 1814 he voted for Napoleon's abdication, which won for him a seat in the chamber of peers; but during the Hundred Days he served Napoleon, and in consequence, on the second Restoration, was for a short while excluded. In the chamber he still sought to obtain liberty for the press—a theme upon which he published a volume of his speeches (Paris, 1817). He was a member of the Institute from its foundation, and in 1816, at the reorganization, became a member of the Académie des Inscriptions et Belles-Lettres. He published in 1819-1821 a two-volume *Essai sur la vie et les opinions de M. de Malesherbes*.

See F.A. Aulard, *Les Orateurs de la Révolution* (2nd ed., 1906); L. Sciout, *Le Directoire* (4 vols., 1895); and the "Notice sur la vie et les œuvres de M. Boissy d'Anglas" in the *Mémoires de l'Académie des Inscriptions*, ix.

(R. A.*)

BOITO, ARRIGO (1842-), Italian poet and musical composer, was born at Padua on the 24th of February 1842. He studied music at the Milan Conservatoire, but even in those early days he devoted as much of his time to literature as to music, forecasting the divided allegiance which was to be the chief characteristic of his life's history. While at the Conservatoire he wrote and composed, in collaboration with Franco Faccio, a cantata, *Le Sorelle d'Italia*, which was performed with success. On completing his studies Boito travelled for some years, and after his return to Italy settled down in Milan, dividing his time between journalism and music. In 1866 he fought under Garibaldi, and in 1868 conducted the first performance of his opera *Mefistofele* at the Scala theatre, Milan. The work failed completely, and was withdrawn after a second performance. It was revived in 1875 at Bologna in a much altered and abbreviated form, when its success was beyond question. It was performed in London in 1880 with success, but in spite of frequent revivals has never succeeded in firmly establishing itself in popular favour. Boito treated the Faust legend in a spirit far more nearly akin to the conception of Goethe than is found in Gounod's Faust, but, in spite of many isolated beauties, his opera lacks cohesion and dramatic interest. His energies were afterwards chiefly devoted to the composition of libretti, of which the principal are *Otello* and *Falstaff*, set to music by Verdi; *La Gioconda*, set by Ponchielli; *Amleto*, set by Faccio; and *Ero e Leandre*, set by Bottesini and Mancinelli. These works display a rare knowledge of the requirements of dramatic poetry, together with uncommon literary value. Boito also published a book of poems and a novel, *L'Alfier Meno*. The degree of doctor of music was conferred upon him in 1893 by the university of Cambridge.

BOIVIN, FRANÇOIS DE, Baron de Villars (d. 1618), French chronicler, entered the service of Charles, Marshal Brissac, as secretary, and accompanied him to Piedmont in 1550 when the marshal went to take command of the French troops in the war with Spain. Remaining in this service he was sent after the defeat of the French at St Quentin in 1557 to assure the French king Henry II. of the support of Brissac. He took part in the negotiations which led to the treaty of Cateau-Cambrésis in April 1559, but was unable to prevent Henry II. from ceding the conquests made by Brissac. Boivin wrote *Mémoires sur les guerres démêlées tant dans le Piémont qu'au Montferrat et duche de Milan par Charles de Cossé, comte de Brissac* (Paris, 1607), which, in spite of some drawbacks, is valuable as the testimony of an eye-witness of the war. An edition, carefully revised, appears in the *Mémoires relatifs à l'histoire de France*, tome x., edited by J.F. Michaud and J.J.F. Poujoulat (Paris, 1850). He also wrote *Instruction sur les affaires d'état* (Lyons, 1610).

See J. Lelong, *Bibliothèque historique de la France* (Paris, 1768-1778).

BOKENAM, OSBERN (1393?-1447?), English author, was born, by his own account, on the 6th of October 1393. Dr Horstmann suggests that he may have been a native of Bokeham, now Bookham, in Surrey, and derived his name from the place. In a concluding note to his *Lives of the Saints* he is described as "a Suffolke man, frere Austyn of Stoke Clare." He travelled in Italy on at least two occasions, and in 1445 was a pilgrim to Santiago de Compostela. He wrote a series of thirteen legends of holy maidens and women. These are written chiefly in seven- and eight-lined stanzas, and nine of them are preceded by prologues. Bokenam was a follower of Chaucer and Lydgate, and doubtless had in mind Chaucer's *Legend of Good Women*. His chief, but by no means his only, source was the *Legenda Aurea* of Jacobus de Voragine, archbishop of Genoa, whom he cites as "Januence." The first of the legends, *Vita Scae Margaretae, virginis et martiris*, was written for his friend, Thomas Burgh, a Cambridge monk; others are dedicated to pious ladies who desired the history of their name-saints. The Arundel MS. 327 (British Museum) is a unique copy of Bokenam's work; it was finished, according to the concluding note, in 1447, and presented by the scribe, Thomas Burgh, to a convent unnamed "that the nuns may remember him and his sister, Dame Betrice Burgh." The poems were edited (1835) for the Roxburghe Club with the title *Lyvys of Seyntys* ..., and by Dr Carl Horstmann as *Osbern Bokenams Legenden* (Heilbronn, 1883), in E. Kölbing's *Altengl. Bibliothek*, vol. i. Both editions include a dialogue written in Latin and English taken from Dugdale's *Monasticon Anglicanum* (ed. 1846, vol. vi. p. 1600); "this dialogue betwixt a Secular asking and a Frere answerynge at the grave of Dame Johan of Acres shewith the lyneal descent of the lordis of the honoure of Clare fro ... MCCXLVIII to ... MCCCLVI". Bokenam wrote, as he tells us, plainly, in the Suffolk speech. He explains his lack of decoration on the plea that the finest flowers had been already plucked by Chaucer, Gower and Lydgate.

BOKHARA, or Bukhara (the common central Asian pronunciation is Bukhara), a state of central Asia, under the protection of Russia. It lies on the right bank of the middle Oxus, between 37° and 41° N., and between 62° and 72° E., and is bounded by the Russian governments of Syr-darya, Samarkand and Ferghana on the N., the Pamirs on the E., Afghanistan on the S., and the Transcaspian territory and Khiva on the W. Its south-eastern frontier on the Pamirs is undetermined except where it touches the Russian dominions. Including the khanates of Karateghin and Darvaz the area is about 85,000 sq. m. The western portion of the state is a plain watered by the Zarafshan and by countless irrigation canals drawn from it. It has in the east the Karnap-chul steppe, covered with grass in early summer, and in the north an intrusion of the Kara-kum sand desert. Land suitable for cultivation is found only in oases, where it is watered by irrigation canals, but these oases are very fertile. The middle portion of the state is occupied by high plateaus, about 4000 ft. in altitude, sloping from the Tian-shan, and intersected by numerous rivers, flowing towards the Oxus. This region, very fertile in the valleys and enjoying a cooler and damper climate than the lower plains, is densely populated, and agriculture and cattle-breeding are carried on extensively. Here are the towns of Karshi, Kitab, Shaar, Chirakchi and Guzar or Huzar. The Hissar range, a westward continuation of the Alai Mountains, separates the Zarafshan from the tributaries of the Oxus—the Surkhan, Kafirnihan and Vakhsh. Its length is about 200 m., and its passes, 1000 to 3000 ft. below the surrounding peaks, reach altitudes of 12,000 to 14,000 ft. and are extremely difficult. Numbers of rivers pierce or flow in wild gorges between its spurs. Its southern foot-hills, covered with loess, make the fertile valleys of Hissar and the Vakhsh. The climate is so dry, and the rains are so scarce, that an absence of forests and Alpine meadows is characteristic of the ridge; but when heavy rain falls simultaneously with the melting of the snows in the mountains, the watercourses become filled with furious torrents, which create great havoc. The main glaciers (12) are on the north slope, but none creeps below 10,000 to 12,000 ft. The Peter the Great range, or Periokh-tau, in Karateghin, south of the valley of the Vakhsh, runs west-south-west to east-north-east for about 130 m., and is higher than the Hissar range. From the meridian of Garm or Harm it rises above the snowline, attaining at least 18,000 ft. in the Sary-kaudal peak, and 20,000 ft. farther east where it joins the snow-clad Darvaz range, and where the group Sandal, adorned with several glaciers, rises to 24,000 or 25,000 ft. Only three passes, very difficult, are known across it.

Darvaz, a small vassal state of Bokhara, is situated on the Panj, where it makes its sharp bend westwards, and is emphatically a mountainous region, agriculture being possible only in the lower parts of the valleys. The population, about 35,000, consists chiefly of Moslem Tajiks, and the closely-related Galchas, and its chief town is Kala-i-khumb on the Panj, at an altitude of 4370 ft.

The chief river of Bokhara is the Oxus or Amu-darya, which separates it from Afghanistan on the south, and then flows along its south-west border. It is navigated from the mouth of the Surkhan, and steamboats ply on it up to Karki near the Afghan frontier. The next largest river, the Zarafshan, 660 m. long, the water of which is

largely utilized for irrigation, is lost in the sands 20 m. before reaching the Oxus. The Kashka-darya, which flows westwards out of the glaciers of Hazret-sultan (west of the Hissar range), supplies the Shahri-sabs (properly Shaar-sabiz) oasis with water, but is lost in the desert to the west of Karshi.

The climate of Bokhara is extreme. In the lowlands a very hot summer is followed by a short but cold winter, during which a frost of -20° Fahr. may set in, and the Oxus may freeze for a fortnight. In the highlands this hot and dry summer is followed by four months of winter; and, finally, in the regions above 8000 ft. there is a great development of snowfields and glaciers, the passes are buried under snow, and the short summer is rainy. The lowlands are sometimes visited by terrible sand-storms from the west, which exhaust men and kill the cotton trees. Malaria is widely prevalent, and in some years, after a wet spring, assumes a malignant character.

The population is estimated at 1,250,000. The dominant race is the Uzbegs, who are fanatical Moslem Sunnites, scorn work, despise their Iranian subjects, and maintain their old division into tribes or clans. The nomad Turkomans and the nomad Kirghiz are also of Turkish origin; while the Sarts, who constitute the bulk of the population in the towns, are a mixture of Turks with Iranians. The great bulk of the population in the country is composed of Iranian Tajiks, who differ but very little from Sarts. Besides these there are Afghans, Persians, Jews, Arabs and Armenians. Much of the trade is in the hands of a colony of Hindus from Shikarpur. Nearly 20% of the population are nomads and about 15% semi-nomads.

On the irrigated lowlands rice, wheat and other cereals are cultivated, and exported to the highlands. Cotton is widely grown and exported. Silk is largely produced, and tobacco, wine, flax, hemp and fruits are cultivated. Cattle-breeding is vigorously prosecuted in Hissar and the highlands generally. Cotton, silks, woollen cloth, and felt are manufactured, also boots, saddles, cutlery and weapons, pottery and various oils. Salt, as also some iron and copper, and small quantities of gold are extracted. Trade has been greatly promoted by the building of the Transcaspian railway across the country (from Charjui on the Oxus to Kati-kurgan) in 1886-1888. The exports to Russia consist of raw cotton and silk, lamb-skins, fruits and carpets, and the imports of manufactured goods and sugar. The imports from India are cottons, tea, shawls and indigo. There are very few roads; goods are transported on camels, or on horses and donkeys in the hilly tracts.

Bokhara has for ages been looked upon as the centre of Mussulman erudition in central Asia. About one-fourth of the population is said to be able to read and write. The primary schools are numerous in the capital, as well as in the other cities, and even exist in villages, and *madrasas* or theological seminaries for higher courses of study are comparatively plentiful. The *mullahs* or priests enjoy very great influence, but the people are very superstitious, believing in witchcraft, omens, spirits and the evil eye. Women occupy a low position in the social scale, though slavery has been abolished at the instance of Russia. The emir of Bokhara is an autocratic ruler, his power being limited only by the traditional custom (*sheriat*) of the Mussulmans. He maintains an army of some 11,000 men, but is subject to Russian control, being in fact a vassal of that empire.

History.—Bokhara was known to the ancients under the name of Sogdiana. It was too far removed to the east ever to be brought under the dominion of Rome, but it has shared deeply in all the various and bloody revolutions of Asia. The foundation of the capital is ascribed to Efrasiab, the great Persian hero. After the conquests of Alexander the Great Sogdiana formed part of the empire of the Seleucidae, and shared the fortunes of the rather better-known Bactria. Somewhat later the nomad Yue-chi began to move into the valley of the Oxus from the east, and gradually became a settled territorial power in Bactria and Sogdiana, and the dominions of their king, Kadphises I. (who is believed to have come to the throne about A.D. 45), extended from Bokhara to the Indus. The district, however, was reconquered by Persia under the Sassanian dynasty, and we hear of Nestorian Christians at Samarkand, at any rate in the 6th century. Islam was introduced shortly after the Arab conquest of Persia (640-642) and speedily became the dominant faith. In the early centuries of Mahommedan rule Sogdiana was one of the most celebrated and flourishing districts of central Asia. It was called Sughd, and contained the two great cities of Samarkand and Bokhara, of which the former was generally the seat of government, while the latter had a high reputation as a seat of religion and learning. During the early middle ages this legion was also known as Ma wara ’l Nahr or Ma-vera-un-nahr, the meaning of which is given in the alternative classical title of Transoxiana. Malik Shah, third of the Seljuk dynasty of Persia, passed the Oxus about the end of the 11th century, and subdued the whole country watered by that river and the Jaxartes. In 1216 Bokhara was again subdued by Mahommed Shah Khwarizm, but his conquest was wrested from him by Jenghiz Khan in 1220. The country was wasted by the fury of this savage conqueror, but recovered something of its former prosperity under Ogdai Khan, his son, whose disposition was humane and benevolent. His posterity kept possession till 1369, when Timur or Tamerlane bore down everything before him, and established his capital at Samarkand, which with Bokhara regained for a time its former splendour. Babar, the fifth in descent from Timur, was originally prince of Ferghana, but conquered Samarkand and northern India, where he founded the Mogul (Mughal) empire. His descendants ruled in the country until about 1500, when it was overrun by the Uzbeg Tatars, under Abulkhair or Ebulkheir Khan, the founder of the Shaibani dynasty, with which the history of Bokhara properly commences. The most remarkable representative of this family was Abdullah Khan (1556-1598), who greatly extended the limits of his kingdom by the conquest of Badakshan, Herat and Meshhed, and increased its prosperity by the public works which he authorized. Before the close of the century, however, the dynasty was extinct, and Bokhara was at once desolated by a Kirghiz invasion and distracted by a disputed succession. At length, in 1598, Baki Mehemet Khan, of the Astrakhan branch of the Timur family, mounted the throne, and thus introduced the dynasty of the Ashtarkhanides. The principal event of his reign was the defeat he inflicted on Shah Abbas of Persia in the neighbourhood of Balkh. His brother Vali Mehemet, who succeeded in 1605, soon alienated his subjects, and was supplanted by his nephew Imamkuli. After a highly prosperous reign this prince resigned in favour of his brother, Nazr Mehemet, under whom the country was greatly troubled by the rebellion of his sons, who continued to quarrel with each other after their father’s death. Meanwhile the district of Khiva, previously subject to Bokhara, was made an independent khanate by Abdul-Gazi Bahadur Khan; and in the reign of Subhankuli, who ascended the throne in 1680, the political power of Bokhara was still further lessened, though it continued to enjoy the unbounded respect of the Sunnite Mahommedans. Subhankuli died in 1702, and a war of succession broke out between his two sons, who were supported by the rivalry of two Uzbeg tribes. After five years the contest terminated in favour of Obeidullah, who was little better than a puppet in the hands of Rehim Bi Atalik, his vizier. The invasion of Nadir Shah of Persia came to complete the degradation of the land; and in 1740 the feeble king, Abu ’l-Faiz, paid homage to the conqueror, and was soon after murdered and supplanted by his vizier. The time of the

Ashtarkhanides had been for the most part a time of dissolution and decay; fanaticism and imbecility went hand in hand. On its fall (1785) the throne was seized by the Manghit family in the person of Mir Ma'sum, who pretended to the most extravagant sanctity, and proved by his military career that he had no small amount of ability. He turned his attention to the encroachments of the Afghans, and in 1781 reconquered the greater part of what had been lost to the south of the Oxus. Dying in 1802 he was succeeded by Saïd, who in bigotry and fanaticism was a true son of his father. In 1826 Nasrullah mounted the throne, and began with the murder of his brother a reign of continued oppression and cruelty. Meanwhile Bokhara became an object of rivalry to Russia and England, and envoys were sent by both nations to cultivate the favour of the emir, who treated the Russians with arrogance and the English with contempt. Two emissaries of the British government, Colonel C. Stoddart and Captain A. Conolly, were thrown by Nasrullah into prison, where they were put to death in 1842. In 1862-1864 Arminius Vambéry made in the disguise of a dervish a memorable journey through this fanatical state. At this time the Russian armies were gradually advancing, and at last they appeared in Khokand; but the new emir, Mozaffer-eddin, instead of attempting to expiate the insults of his predecessor, sent a letter to General M.G. Chernayev summoning him to evacuate the country, and threatening to raise all the faithful against him. In 1866 the Russians invaded the territory of Bokhara proper, and a decisive battle was fought on the 20th of May at Irdjar on the left bank of the Jaxartes. The Bokharians were defeated; but after a period of reluctant peace they forced the emir to renew the war. In 1868 the Russians entered Samarkand (May 14), and the emir was constrained to submit to the terms of the conqueror, becoming henceforward only a Russian puppet.

See Khanikov's *Bokhara*, translated by De Bode (1845); Vambéry, *Travels in Central Asia* (1864), *Sketches of Central Asia* (1868), and *History of Bokhara* (1873); Fedchenko's "Sketch of the Zarafshan Valley" in *Journ. R. Geogr. Soc.* (1870); Hellwald, *Die Russen in Central Asien* (1873); Lipsky, *Upper Bukhara*, in Russian (1902); Skrine and Ross, *The Heart of Asia* (1899); Lord Ronaldshay, *Outskirts of Empire in Asia* (1904); and Le Strange, *The Lands of the Eastern Caliphate* (1905).

(P. A. K.; C. EL.)

BOKHARA (Bokkara-i-Sherif), capital of the state of Bokhara, on the left bank of the Zarafshan, and on the irrigation canal of Shahri-rud, situated in a fertile plain. It is 8 m. from the Bokhara station of the Transcaspian railway, 162 m. by rail W. of Samarkand, in 39° 47′ N. lat. and 64° 27′ E. long. The city is surrounded by a stone wall 28 ft. high and 8 m. long, with semicircular towers and eleven gates of little value as a defence. The present city was begun in A.D. 830 on the site of an older city, was destroyed by Jenghiz Khan in 1220, and rebuilt subsequently. The water-supply is very unhealthy. The city has no less than 360 mosques. Nearly 10,000 pupils are said to receive their education in its 140 *madrasas* or theological colleges; primary schools are kept at most mosques. Some of these buildings exhibit very fine architecture. The most notable of the mosques is the Mir-Arab, built in the 16th century, with its beautiful lecture halls; the chief mosque of the emir is the Mejid-kalyan, or Kok-humbez, close by which stands a brick minaret, 203 ft. high, from the top of which state criminals used to be thrown until 1871. Of the numerous squares the Raghistan is the principal. It has on one side the citadel, erected on an artificially made eminence 45 ft. high, surrounded by a wall 1 m. long, and containing the palace of the emir, the houses of the chief functionaries, the prison and the water-cisterns. The houses are mostly one-storeyed, built of unburned bricks, and have flat roofs.

Bokhara has for ages been a centre of learning and religious life. The mysticism which took hold on Persia in the middle ages spread also to Bokhara, and later, when the Mongol invasions of the 13th century laid waste Samarkand and other Moslem cities, Bokhara, remaining independent, continued to be a chief seat of Islamitic learning. The *madrasa* libraries, some of which were very rich, have been scattered and lost, or confiscated by the emirs, or have perished in conflagrations. But there are still treasures of literature concealed in private libraries, and Afghan, Persian, Armenian and Turkish bibliophiles still repair to Bokhara to buy rare books. Bokhara is, in fact, the principal book-market of central Asia. The population is supposed by Russian travellers not to exceed 50,000 or 60,000, but is otherwise estimated at 75,000 to 100,000. Amongst them is a large and ancient colony of Jews. Bokhara is the most important trading town in central Asia. In the city bazaars are made or sold silk stuffs, metal (especially copper) wares, Kara-kul (*i.e.* astrakhan) lamb-skins and carpets.

New Bokhara, or *Kagan*, a Russian town near the railway station, 8 m. from Bokhara itself, is rapidly growing, on a territory ceded by the emir. Pop. 2000.

(P. A. K.)

BOKSBURG, a town of the Transvaal; 14 m. E. of Johannesburg by rail. Pop. of the municipality (1904) 14,757, of whom 4175 were whites. It is the headquarters of the Witwatersrand coal mining industry. The collieries extend from Boksburg eastward to Springs, 11 m. distant. Brakpan, the largest colliery in South Africa, lies midway between the places named.

BOLAN PASS, an important pass on the Baluch frontier, connecting Jacobabad and Sibi with Quetta, which has always occupied an important place in the history of British campaigns in Afghanistan. Since the treaty of Gandamak, which was signed at the close of the first phase of the Afghan War in 1879, the Bolan route has

been brought directly under British control, and it was selected for the first alignment of the Sind-Pishin railway from the plains to the plateau. From Sibi the line runs south-west, skirting the hills to Rindli, and originally followed the course of the Bolan stream to its head on the plateau. The destructive action of floods, however, led to the abandonment of this alignment, and the railway now follows the Mashkaf valley (which debouches into the plains close to Sibi), and is carried from near the head of the Mashkaf to a junction with the Bolan at Mach. An alternative route from Sibi to Quetta was found in the Harnai valley to the N.E. of Sibi, the line starting in exactly the opposite direction to that of the Bolan and entering the hills at Nari. The Harnai route, although longer, is the one adopted for all ordinary traffic, the Bolan loop being reserved for emergencies. At the Khundilani gorge of the Bolan route conglomerate cliffs enclose the valley rising to a height of 800 ft., and at Sir-i-Bolan the passage between the limestone rocks hardly admits of three persons riding abreast. The temperature of the pass in summer is very high, whereas in winter, near its head, the cold is extreme, and the ice-cold wind rushing down the narrow outlet becomes destructive to life. Since 1877, when the Quetta agency was founded, the freedom of the pass from plundering bands of Baluch marauders (chiefly Marris) has been secured, and it is now as safe as any pass in Scotland.

(T. H. H.*)

BOLAS (plural of Span, *bola*, ball), a South American Indian weapon of war and the chase, consisting of balls of stone attached to the ends of a rope of twisted or braided hide or hemp. Charles Darwin thus describes them in his *Voyage of the Beagle*: “The *bolas*, or balls, are of two kinds: the simplest, which is used chiefly for catching ostriches, consists of two round stones, covered with leather, and united by a thin, plaited thong, about 8 ft. long. The other kind differs only in having three balls united by thongs to a common centre. The Gaucho (native of Spanish descent) holds the smallest of the three in his hand, and whirls the other two around his head; then, taking aim, sends them like chain shot revolving through the air. The balls no sooner strike any object, than, winding round it, they cross each other and become firmly hitched.” Bolas have been used for centuries in the South American pampas and even the forest regions of the Rio Grande. F. Ratzel (*History of Mankind*) supposes them to be a form of lasso. The Eskimos use a somewhat similar weapon to kill birds. *Bolas perdidas* (*i.e.* lost) are stones attached to a very short thong, or, in some cases, having none at all.

BOLBEC, a town of northern France, in the department of Seine-Inférieure, on the Bolbec, 19 m. E.N.E. of Havre by rail. Pop. (1906) 10,959. Bolbec is important for its cotton spinning and weaving, and carries on the dyeing and printing of the fabric, and the manufacture of sugar. There are a chamber of commerce and a board of trade-arbitration. The town was enthusiastic in the cause of the Reformed Religion in the 16th century, and still contains many Protestants. It was burned almost to the ground in 1765.

BOLE (Gr. βῶλος, “a clod of earth”), a clay-like substance of red, brown or yellow colour, consisting essentially of hydrous aluminium silicate, with more or less iron. Most bole differs from ordinary clay in not being plastic, but in dropping to pieces when placed in water, thus behaving rather like fuller’s-earth. Bole was formerly in great repute medicinally, the most famous kind being the Lemnian Earth (γῆ Λήμνια), from the Isle of Lemnos in the Greek Archipelago. The earth was dug with much ceremony only once a year, and having been mixed with goats’ blood was made into little cakes or balls, which were stamped by the priests, whence they became known as *Terra sigillata* (“sealed earth”). Large quantities of bole occur as red partings between the successive lava flows of the Tertiary volcanic series in the north of Ireland and the west of Scotland. Here it seems to have resulted from the decomposition of the basalt and kindred rocks by meteoric agencies, during periods of volcanic repose. In Antrim the bole is associated with lithomarge, bauxite and pisolitic iron-ore. Bole occurs in like manner between the great sheets of the Deccan traps in India; and a similar substance is also found interbedded with some of the doleritic lavas of Etna.

In the sense of stem or trunk of a tree, “bole” is from the O. Norwegian *bolr*, of. Ger. *Bohle*, plank. It is probably connected with the large number of words, such as “boll,” “ball,” “bowl,” &c., which stand for a round object.

BOLESLAUS I., called “The Great,” king of Poland (d. 1025), was the son of Mieszko, first Christian prince of Poland, and the Bohemian princess Dobrawa, or Bona, whose chaplain, Jordan, converted the court from paganism to Catholicism. He succeeded his father in 992. A born warrior, he speedily raised the little struggling Polish principality on the Vistula to the rank of a great power. In 996 he gained a seaboard by seizing Pomerania, and subsequently took advantage of the troubles in Bohemia to occupy Cracow, previously a Czech city. Like his contemporaries, Stephen of Hungary and Canute of Denmark, Boleslaus recognized from the first the essential superiority of Christianity over every other form of religion, and he deserves with them the name

of “Great” because he deliberately associated himself with the new faith. Thus despite an inordinate love of adventure, which makes him appear rather a wandering chieftain than an established ruler, he was essentially a man of insight and progress. He showed great sagacity in receiving the fugitive Adalbert, bishop of Prague, and when the saint suffered martyrdom at the hands of the pagan Slavs (April 23, 997), Boleslaus purchased his relics and solemnly laid them in the church of Gnesen, founded by his father, which now became the metropolitan see of Poland. It was at Gnesen that Boleslaus in the year 1000 entertained Otto III. so magnificently that the emperor, declaring such a man too worthy to be merely *princeps*, conferred upon him the royal crown, though twenty-five years later, in the last year of his life, Boleslaus thought it necessary to crown himself king a second time. On the death of Otto, Boleslaus invaded Germany, penetrated to the Elbe, occupying Stralsund and Meissen on his way, and extended his dominions to the Elster and the Saale. He also occupied Bohemia, till driven out by the emperor Henry IV. in 1004. The German war was terminated in 1018 by the peace of Bautzen, greatly to the advantage of Boleslaus, who retained Lusatia. He then turned his arms against Jaroslav, grand duke of Kiev, whom he routed on the banks of the Bug, then the boundary between Russia and Poland. For ten months Boleslaus remained at Kiev, whence he addressed triumphant letters to the emperors of the East and West. At his death in 1025 he left Poland one of the mightiest states of Europe, extending from the Bug to the Elbe, and from the Baltic to the Danube, and possessing besides the overlordship of Russia. But his greatest achievement was the establishment in Poland of a native church, the first step towards political independence.

See J.N. Pawlowski, *St Adalbert* (Danzig, 1860); *Chronica Nestoris* (Vienna, 1860); Heinrich R. von Zeissberg, *Die Kriege Kaiser Heinrichs II. mit Herzog Boleslaw I.* (Vienna, 1868).

BOLESLAUS II., called “The Bold,” king of Poland (1039-1081), eldest son of Casimir I., succeeded his father in 1058. The domestic order and tranquillity of the kingdom had been restored by his painstaking father, but Poland had shrunk territorially since the age of his grandfather Boleslaus I., and it was the aim of Boleslaus II. to restore her dignity and importance. The nearest enemy was Bohemia, to whom Poland had lately been compelled to pay tribute for her oldest possession, Silesia. But Boleslaus’s first Bohemian war proved unsuccessful, and was terminated by the marriage of his sister Swatawa with the Czech king Wratyslaus II. On the other hand Boleslaus’s ally, the fugitive Magyar prince Bela, succeeded with Polish assistance in winning the crown of Hungary. In the East Boleslaus was more successful. In 1069 he succeeded in placing Izaslaus on the throne of Kiev, thereby confirming Poland’s overlordship over Russia and enabling Boleslaus to chastise his other enemies, Bohemia among them, with the co-operation of his Russian auxiliaries. But Wratyslaus of Bohemia speedily appealed to the emperor for help, and a war between Poland and the Empire was only prevented by the sudden rupture of Henry IV. with the Holy See and the momentous events which led to the humiliating surrender of the emperor at Canossa. There is nothing to show that Boleslaus took any part in this struggle, though at this time he was on the best of terms with Gregory VII. and there was some talk of sending papal legates to restore order in the Polish Church. On the 26th of December 1076 Boleslaus encircled his own brows with the royal diadem, a striking proof that the Polish kings did not even yet consider their title quite secure. A second successful expedition to Kiev to reinstate his *protégé* Izaslaus, is Boleslaus’s last recorded exploit. Almost immediately afterwards (1079) we find him an exile in Hungary, where he died about 1081. The cause of this sudden eclipse was the cruel vengeance he took on the *milites*, or noble order, who, emulating the example of their brethren in Bohemia, were already attempting to curb the royal power. The churchmen headed by Stanislaus Szczepanowski, bishop of Cracow, took the side of the nobles, whose grievances seem to have been real. Boleslaus in his fury slew the saintly bishop, but so general was the popular indignation that he had to fly his kingdom.

See M. Maksymilian Gumplowicz, *Zur Geschichte Polens im Mittelalter* (Innsbruck, 1898); W.P. Augerstein, *Der Konflikt des polnischen Königs Boleslaw II. mit dem Bischof Stanislaus* (Thorn, 1895).

BOLESLAUS III., king of Poland (1086-1139), the son of Wladislaus I. and Judith of Bohemia, was born on the 23rd of December 1086 and succeeded his father in 1102. His earlier years were troubled continually by the intrigues of his natural half-brother Zbigniew, who till he was imprisoned and blinded involved Boleslaus in frequent contests with Bohemia and the emperor Henry V. The first of the German wars began in 1109, when Henry, materially assisted by the Bohemians, invaded Silesia. It was mainly a war of sieges, Henry sitting down before Lubusz, Glogau and Breslau, all of which he failed to take. The Poles avoided an encounter in the open field, but harried the Germans so successfully around Breslau that the plain was covered with corpses, which Henry had to leave to the dogs on his disastrous retreat; hence the scene of the action was known as “the field of dogs.” The chief political result of this disaster was the complete independence of Poland for the next quarter of a century. It was during this respite that Boleslaus devoted himself to the main business of his life—the subjugation of Pomerania (*i.e.* the maritime province) with the view of gaining access to the sea. Pomerania, protected on the south by virgin forests and almost impenetrable morasses, was in those days inhabited by a valiant and savage Slavonic race akin to the Wends, who clung to paganism with unconquerable obstinacy. The possession of a seaboard enabled them to maintain fleets and build relatively large towns such as Stettin and Kolberg, whilst they ravaged at will the territories of their southern neighbours the Poles. In self-defence Boleslaus was obliged to subdue them. The struggle began in 1109, when Boleslaus inflicted a terrible defeat on the Pomeranians at Nackel which compelled their temporary submission. In 1120-1124 the rebellion of his vassal Prince Warceslaus of Stettin again brought Boleslaus into the country, but the resistance was as stout as ever, and only after 18,000 of his followers had fallen and 8000 more had been expatriated did Warceslaus submit to his conqueror. The obstinacy of the resistance convinced Boleslaus that Pomerania must be

christianized before it could be completely subdued; and this important work was partially accomplished by St Otto, bishop of Bamberg, an old friend of Boleslaus's father, who knew the Slavonic languages. In 1124 the southern portions of the land were converted by St Otto, but it was only under the threat of extermination if they persisted in their evil ways that the people of Stettin accepted the faith in the following year. In 1128, at the council of Usedom, St Otto appointed his disciple Boniface bishop of Julin, the first Pomeranian diocese, and the foundation of a better order of things was laid. In his later years Boleslaus waged an unsuccessful war with Hungary and Bohemia, and was forced to claim the mediation of the emperor Lothair, to whom he did homage for Pomerania and Rügen at the diet of Merseburg in 1135. He died in 1139.

See Gallus, *Chronicon*, ed. Finkal (Cracow, 1899); Maksymilian Gumplowicz, *Zur Geschichte Polens im Mittelalter* (Innsbruck, 1898).

BOLETUS, a well-marked genus of fungi (order *Polyporeae*), characterized by the central stem, the cap or pileus, the soft, fleshy tissue, and the vertical, closely-packed tubes or pores which cover the under surface of the pileus and are easily detachable. The species all grow on the ground, in woods or under trees, in the early autumn. They are brown, red or yellow in colour; the pores also vary in colour from pure white to brown, red, yellow or green, and are from one or two lines to nearly an inch long. A few are poisonous; several are good for eating. One of the greatest favourites for the table is *Boletus edulis*, recognized by its brown cap and white pores which become green when old. It is the *ceps* of the continental European markets. There are forty-nine British species of *Boletus*.

BOLEYN (or Bullen), **ANNE** (*c.* 1507-1536), queen of Henry VIII. of England, daughter of Sir Thomas Boleyn, afterwards earl of Wiltshire and Ormonde, and of Elizabeth, daughter of Thomas Howard, earl of Surrey, afterwards duke of Norfolk, was born, according to Camden, in 1507, but her birth has been ascribed, though not conclusively, to an earlier date (to 1502 or 1501) by some later writers.[1] In 1514 she accompanied Mary Tudor to France on the marriage of the princess to Louis XII., remained there after the king's death, and became one of the women in waiting to Queen Claude, wife of Francis I. She returned in 1521 or 1522 to England, where she had many admirers and suitors. Among the former was the poet Sir Thomas Wyatt,[2] and among the latter, Henry Percy, heir of the earl of Northumberland, a marriage with whom, however, was stopped by the king and another match provided for her in the person of Sir James Butler. Anne Boleyn, however, remained unmarried, and a series of grants and favours bestowed by Henry on her father between 1522 and 1525 have been taken, though very doubtfully, as a symptom of the king's affections. Unlike her sister Mary, who had fallen a victim to Henry's solicitations,[3] Anne had no intention of being the king's mistress; she meant to be his queen, and her conduct seems to have been governed entirely by motives of ambition. The exact period of the beginning of Anne's relations with Henry is not known. They have been surmised as originating as early as 1523; but there is nothing to prove that Henry's passion was anterior to the proceedings taken for the divorce in May 1527, the celebrated love letters being undated. Her name is first openly connected with the king's as a possible wife in the event of Catherine's divorce, in a letter of Mendoza, the imperial ambassador, to Charles V. of the 16th of August 1527,[4] during the absence in France of Wolsey, who, not blinded by passion like Henry, naturally opposed the undesirable alliance, and was negotiating a marriage with Renée, daughter of Louis XII. Henry meanwhile, however, had sent William Knight, his secretary, on a separate mission to Rome to obtain facilities for his marriage with Anne; and on the cardinal's return in August he found her installed as the king's companion and proposed successor to Catherine of Aragon. After the king's final separation from his wife in July 1531, Anne's position was still more marked, and in 1532 she accompanied Henry on the visit to Francis I., while Catherine was left at home neglected and practically a prisoner. Soon after their return Anne was found to be pregnant, and in consequence Henry married her about the 25th of January 1533[5] (the exact date is unknown), their union not being made public till the following Easter. Subsequently, on the 23rd of May, their marriage was declared valid and that with Catherine null, and in June Anne was crowned with great state in Westminster Abbey. Anne Boleyn had now reached the zenith of her hopes. A weak, giddy woman of no stability of character, her success turned her head and caused her to behave with insolence and impropriety, in strong contrast with Catherine's quiet dignity under her misfortunes. She, and not the king, probably was the author of the petty persecutions inflicted upon Catherine and upon the princess Mary, and her jealousy of the latter showed itself in spiteful malice. Mary was to be forced into the position of a humble attendant upon Anne's infant, and her ears were to be boxed if she proved recalcitrant. She urged that both should be brought to trial under the new statute of succession passed in 1534, which declared her own children the lawful heirs to the throne. She was reported as saying that when the king gave opportunity by leaving England, she would put Mary to death even if she were burnt or flayed alive for it.[6] She incurred the remonstrances of the privy council and alienated her own friends and relations. Her uncle, the duke of Norfolk, whom she was reported to have treated "worse than a dog," reviled her, calling her a "grande putaine." But her day of triumph was destined to be even shorter than that of her predecessor. There were soon signs that Henry's affection, which had before been a genuine passion, had cooled or ceased. He resented her arrogance, and a few months after the marriage he gave her cause for jealousy, and disputes arose. A strange and mysterious fate had prepared for Anne the same domestic griefs that had vexed and ruined Catherine and caused her abandonment. In September 1533 the birth of a daughter, afterwards Queen Elizabeth, instead of the long-hoped-for son, was a heavy disappointment; next year there was a miscarriage, and on the 29th of January 1536, the day of Catherine's funeral, she gave birth to a dead male child.

On the 1st of May following the king suddenly broke up a tournament at Greenwich, leaving the company in

bewilderment and consternation. The cause was soon known. Inquiries had been made on reports of the queen's ill-conduct, and several of her reputed lovers had been arrested. On the 2nd Anne herself was committed to the Tower on a charge of adultery with various persons, including her own brother, Lord Rochford. On the 12th Sir Francis Weston, Henry Norris, William Brereton and Mark Smeaton were declared guilty of high treason, while Anne herself and Lord Rochford were condemned unanimously by an assembly of twenty-six peers on the 15th. Her uncle, the duke of Norfolk, presided as lord steward, and gave sentence, weeping, that his niece was to be burned or beheaded as pleased the king. Her former lover, the earl of Northumberland, left the court seized with sudden illness. Her father, who was excused attendance, had, however, been present at the trial of the other offenders, and had there declared his conviction of his daughter's guilt. On the 16th, hoping probably to save herself by these means, she informed Cranmer of a certain supposed impediment to her marriage with the king—according to some accounts a previous marriage with Northumberland, though the latter solemnly and positively denied it—which was never disclosed, but which, having been considered by the archbishop and a committee of ecclesiastical lawyers, was pronounced, on the 17th, sufficient to invalidate her marriage. The same day all her reputed lovers were executed; and on the 19th she herself suffered death on Tower Green, her head being struck off with a sword by the executioner of Calais brought to England for the purpose.[7] She had regarded the prospect of death with courage and almost with levity, laughing heartily as she put her hands about her "little neck" and recalled the skill of the executioner. "I have seen many men" (wrote Sir William Kingston, governor of the Tower) "and also women executed, and all they have been in great sorrow, and to my knowledge this lady has much joy and pleasure in death." On the following day Henry was betrothed to Jane Seymour.

Amidst the vituperations of the adherents of the papacy and the later Elizabethan eulogies, and in the absence of the records on which her sentence was pronounced, Anne Boleyn's guilt remains unproved. To Sir William Kingston she protested her entire innocence, and on the scaffold while expressing her submission she made no confession.[8] Smeaton alone of her supposed lovers made a full confession, and it is possible that his statement was drawn from him by threats of torture or hopes of pardon. Norris, according to one account,[9] also confessed, but subsequently declared that he had been betrayed into making his statement. The others were all said to have "confessed in a manner" on the scaffold, but much weight cannot be placed on these general confessions, which were, according to the custom of the time, a declaration of submission to the king's will and of general repentance rather than acknowledgment of the special crime. "I pray God save the king," Anne herself is reported to have said on the scaffold, "and send him long to reign over you, for a gentler nor a more merciful prince was there never; and to me he was ever a good, a gentle and sovereign lord." A principal witness for the charge of incest was Rochford's own wife, a woman of infamous character, afterwards executed for complicity in the intrigues of Catherine Howard. The discovery of Anne's misdeeds coincided in an extraordinary manner with Henry's disappointment in not obtaining by her a male heir, while the king's despotic power and the universal unpopularity of Anne both tended to hinder the administration of pure justice. Nevertheless, though unproved, Anne's guilt is more than probable. It is almost incredible that two grand juries, a petty jury, and a tribunal consisting of nearly all the lay peers of England, with the evidence before them which we do not now possess, should have all unanimously passed a sentence of guilt contrary to the facts and their convictions, and that such a sentence should have been supported by Anne's own father and uncle. Every year since her marriage Anne had given birth to a child, and Henry had no reason to despair of more; while, if Henry's state of health was such as was reported, the desire for children, which Anne shared with him, may be urged as an argument for her guilt. Sir Francis Weston in a letter to his family almost acknowledges his guilt in praying for pardon, especially for offences against his wife;[10] Anne's own conduct and character almost prepare us for some catastrophe. Whether innocent or guilty, however, her fate caused no regrets and her misfortunes did not raise a single champion or defender. The sordid incidents of her rise, and the insolence with which she used her triumph, had alienated all hearts from the unhappy woman. Among the people she had always been intensely disliked; the love of justice, and the fear of trade losses imminent upon a breach with Charles V., combined to render her unpopular. She appealed to the king's less refined instincts, and Henry's deterioration of character may be dated from his connexion with her. She is described as "not one of the handsomest women in the world; she is of a middling stature, swarthy complexion, long neck, wide mouth, bosom not much raised, and in fact has nothing but the English king's great appetite, and her eyes which are black and beautiful, and take great effect."[11] Cranmer admired her—"sitting in her hair" (*i.e.* with her hair falling over her shoulders, which seems to have been her custom on great occasions), "upon a horse litter, richly apparelled," at her coronation.[12]

Bibliography.—Art. in the *Dict. of Nat. Biography* and authorities cited; *Henry VIII.* by A.F. Pollard (1905); *Anne Boleyn*, by P. Friedman (1884); *The Early Life of Anne Boleyn*, by J.H. Round (1886); *The Divorce of Catherine of Aragon*, by J.A. Froude (1891); "Der Ursprung der Ehescheidung König Heinrichs VIII." and "Der Sturz des Cardinals Wolsey," by W. Busch (*Historisches Taschenbuch*, vi. Folge viii. 273 and ix. 41, 1889 and 1890); *Lives*, by Miss E.O. Benger (1821); and Miss A. Strickland, *Lives of the Queens of England* (1851), vol. ii.; *Notices of Historic Persons Buried in the Tower of London*, by D.C. Bell (1877); *The Wives of Henry VIII.* by M.A.S. Hume (1905); *Excerpta Historica*, by N.H. Nicolas (1831), p. 260; *Spanish Chronicle of Henry VIII.* tr. by M.A.S. Hume (1889); *Records of the Reformation*, by N. Pocock (1870); *Harleian Miscellany* (1808), iii. 47 (the love letters); *Archaeologia*, xxiii. 64 (memorial of G. Constantyne); *Eng. Hist. Rev.* v. 544, viii. 53, 299, x. 104; *State Trials*, i. 410; *History of Henry VIII.* by Lord Herbert of Cherbury; E. Hall's *Chronicle: Original Letters*, ed. by Sir H. Ellis, i. ser., ii. 37, 53 et seq., ii. ser., ii. 10; *Extracts from the Life of Queen Anne Boleigne*, by G. Wyat (1817); *The Negotiations of Thomas Wolsey*, by Sir W. Cavendish (1641, rep. Harleian Misc. 1810 v.); C. Wriothesley's *Chronicle* (Camden Soc., 1875-1877); *Notes and Queries*, 8 ser., viii. 141, 189, 313, 350; *Il Successo de la Morte de la Regina de Inghilterra* (1536); *The Maner of the Tryumphe of Caleys and Bullen*, and the *Noble Tryumphaunt Coronacyon of Queen Anne* (1533, rep. 1884); *State Papers Henry VIII.*; *Letters and Papers of Henry VIII.*, by Brewer and Gardiner, esp. the prefaces; *Cal. of State Pap. England and Spain, Venetian and Foreign* (1558-1559), p. 525 (an account full of obvious errors); *Colton MSS.* (Brit. Mus.), Otho C. 10; "Baga de secretis" in Rep. iii., App. ii. of Dep. Keeper of Public Records, p. 242; "Römische Dokumente," v., M.S. Ehses (*Gorres-gesellschaft*, Bd. ii., 1893). See also articles on Catherine of Aragon and Henry VIII.

(P. C. Y.)

1 See *Anne Boleyn*, by P. Friedman; *The Early Life of Anne Boleyn*, by J.H. Round; and J. Gairdner in *Eng. Hist. Review*, viii. 53, 299, and x. 104.

2 According to the *Chronicle of King Henry VIII.*, tr. by M.A.S. Hume, p. 68, she was his mistress.

3 Of this there is no direct proof, but the statement rests upon contemporary belief and chiefly upon the extraordinary terms of the dispensation granted to Henry to marry Anne Boleyn, which included the suspension of all canons relating to impediments created by "affinity rising *ex illicito coitu* in any degree even in the first." Froude rejects the whole story, *Divorce of Catherine of Aragon*, p. 54; and see Friedman's *Anne Boleyn*, ii. 323.

4 *Cat. of St. Pap. England and Spain*, iii. pt. ii. p. 327.

5 According to Cranmer, *Letters and Papers of Henry VIII.* vi. p. 300, the only authority; and Cranmer himself only knew of it a fortnight after. The marriage was commonly antedated to the 14th of November 1532.

6 *Cat. of St. Pap. England and Spain*, v. 198.

7 *Letters and Papers of Henry VIII.*, x. pp. 374, 381, 385.

8 According to the most trustworthy accounts, but see *Letters and Papers*, x. p. 382. The well-known letter to Henry VIII. attributed to her is now recognized as an Elizabethan forgery.

9 *Archaeologia*, xxiii. 64.

10 *Letters and Papers*, x. 358.

11 "Sanuto Diaries," October 31, 1532, in *Cal. of St. Pap. Venetian*, iv. p. 365.

12 *Original Letters*, ed. by Sir H. Ellis, 1 ser. ii. 37, and *Cal. of St. Pap. Venetian*, iv. 351, 418.

BOLGARI, or Bolgary, a ruined town of Russia, in the government of Kazan, 4 m. from the left bank of the Volga, in 55°N. lat. It is generally considered to have been the capital of the Bulgarians when they were established in that part of Europe (5th to 15th century). Ruins of the old walls and towers still survive, as well as numerous *kurgans* or burial-mounds, with inscriptions, some in Arabic (1222-1341), others in Armenian (years 557, 984 and 986), and yet others in Turkic. Upon being opened these tombs were found to contain weapons, implements, utensils, and silver and copper coins, bearing inscriptions, some in ordinary Arabic, others in Kufic (a kind of epigraphic Arabic). These and other antiquities collected here (1722) are preserved in museums at Kazan, Moscow and St Petersburg. The ruins, which were practically discovered in the reign of Peter the Great, were visited and described by Pallas, Humboldt and others. The city of Bolgari was destroyed by the Mongols in 1238, and again by Tamerlane early in the following century, after which it served as the capital of the Khans (sovereign princes) of the Golden Horde of Mongols, and finally, in the second half of the 15th century it became a part of the principality of Kazan, and so eventually of Russia. The Arab geographer Ibn Haukal states that in his time, near the end of the 10th century, it was a place of 10,000 inhabitants.

See Ibn Fadhlan, *Nachrichten über die Wolga Bulgaren* (Ger. trans. by Frähn, St Petersburg, 1832).

BOLI, the chief town of a sanjak of the Kastamuni vilayet in Asia Minor, altitude 2500 ft., situated in a rich plain watered by the Boli Su, a tributary of the Filiyas Chai (*Billaeus*). Pop. (1894) 10,796 (Moslems, 9642; Greeks, 758; Armenians, 396). Cotton and leather are manufactured; the country around is fertile, and in the neighbourhood are large forests of oak, beech, elm, chestnut and pine, the timber of which is partly used locally and partly exported to Constantinople. Three miles east of Boli, at Eskihissar, are the ruins of *Bithynium*, the birthplace of Antinous, also called *Antinoopolis*, and in Byzantine times *Claudiopolis*. In and around Boli are numerous marbles with Greek inscriptions, chiefly sepulchral, and architectural fragments. At Ilija, south of the town, are warm springs much prized for their medicinal properties.

BOLINGBROKE, HENRY ST JOHN, Viscount (1678-1751), English statesman and writer, son of Sir Henry St John, Bart. (afterwards 1st Viscount St John, a member of a younger branch of the family of the earls of Bolingbroke and barons St John of Bletso), and of Lady Mary Rich, daughter of the 2nd earl of Warwick, was baptized on the 10th of October 1678, and was educated at Eton. He travelled abroad during 1698 and 1699 and acquired an exceptional knowledge of French. The dissipation and extravagance of his youth exceeded all limits and surprised his contemporaries. He spent weeks in riotous orgies and outdrank the most experienced drunkards. An informant of Goldsmith saw him once "run naked through the park in a state of intoxication." Throughout his career he desired, says Swift, his intimate friend, to be thought the Alcibiades or Petronius of his age, and to mix licentious orgies with the highest political responsibilities.[1] In 1700 he married Frances, daughter of Sir Henry Winchcombe, Bart., of Bucklebury, Berkshire, but matrimony while improving his fortune did not redeem his morals.

He was returned to parliament in 1701 for the family borough of Wootton Bassett in Wiltshire. He declared himself a Tory, attached himself to Harley (afterwards Lord Oxford), then speaker, whom he now addressed as "dear master," and distinguished himself by his eloquence in debate, eclipsing his schoolfellow, Walpole, and gaining an extraordinary ascendancy over the House of Commons. In May he had charge of the bill for securing the Protestant succession; he took part in the impeachment of the Whig lords for their conduct concerning the Partition treaties, and opposed the oath abjuring the Pretender. In March 1702 he was chosen commissioner for

taking the public accounts. After Anne's accession he supported the bills in 1702 and 1704 against occasional conformity, and took a leading part in the disputes which arose between the two Houses. In 1704 St John took office with Harley as secretary at war, thus being brought into intimate relations with Marlborough, by whom he was treated with paternal partiality. In 1708 he quitted office with Harley on the failure of the latter's intrigue, and retired to the country till 1710, when he became a privy councillor and secretary of state in Harley's new ministry, representing Berkshire in parliament. He supported the bill for requiring a real property qualification for a seat in parliament. In 1711 he founded the Brothers' Club, a society of Tory politicians and men of letters, and the same year witnessed the failure of the two expeditions to the West Indies and to Canada promoted by him. In 1712 he was the author of the bill taxing newspapers. But the great business of the new government was the making of the peace with France. The refusal of the Whigs to grant terms in 1706, and again in 1709 when Louis XIV. offered to yield every point for which the allies professed to be fighting, showed that the war was not being continued for English national interests, and the ministry were supported by the queen, the parliament and the people in their design to terminate hostilities. But various obstacles arose from the diversity of aims among the allies; and St John was induced, contrary to the most solemn obligations, to enter into separate and secret negotiations with France for the security of English interests. In May 1712 St John ordered the duke of Ormonde, who had succeeded Marlborough in the command, to refrain from any further engagement. These instructions were communicated to the French, though not to the allies, Louis putting Dunkirk as security into possession of England, and the shameful spectacle was witnessed of the desertion by the English troops of their allies almost on the battlefield. Subsequently St John received the congratulations of the French minister, Torcy, on the occasion of the French victory over Prince Eugene at Denain.

In August St John, who had on the 7th of July been created Viscount Bolingbroke and Baron St John of Lydiard Tregoze, went to France to conduct negotiations, and signed an armistice between England and France for four months on the 19th. Finally the treaty of Utrecht was signed on the 31st of March 1713 by all the allies except the emperor. The first production of Addison's *Cato* was made by the Whigs the occasion of a great demonstration of indignation against the peace, and by Bolingbroke for presenting the actor Booth with a purse of fifty guineas for "defending the cause of liberty against a perpetual dictator" (Marlborough). In the terms granted to England there was perhaps little to criticize. But the manner of the peacemaking, which had been carried on by a series of underhand conspiracies with the enemy instead of by open conferences with the allies, and was characterized throughout by a violation of the most solemn international assurances, left a deep and lasting stain upon the national honour and credit; and not less dishonourable was the abandonment of the Catalans by the treaty. For all this Bolingbroke must be held primarily responsible. In June his commercial treaty with France, establishing free trade with that country, was rejected. Meanwhile the friendship between Bolingbroke and Harley, which formed the basis of the whole Tory administration, had been gradually dissolved. In March 1711, by Guiscard's attempt on his life, Harley got the wound which had been intended for St John, with all the credit. In May Harley obtained the earldom of Oxford and was made lord treasurer, while in July St John was greatly disappointed at receiving only his viscountcy instead of the earldom lately extinct in his family, and at being passed over for the Garter. In September 1713 Swift came to London, and made a last but vain attempt to reconcile his two friends. But now a further cause of difference had arisen. The queen's health was visibly breaking, and the Tory ministers could only look forward to their own downfall on the accession of the elector of Hanover. Both Oxford[2] and Bolingbroke had maintained for some time secret communications with James, and promised their help in restoring him at the queen's death. The aims of the former, prudent, procrastinating and vacillating by nature, never extended probably beyond the propitiation of his Tory followers; and it is difficult to imagine that Bolingbroke could have really advocated the Pretender's recall, whose divine right he repudiated and whose religion and principles he despised. Nevertheless, whatever his chief motive may have been, whether to displace Oxford as leader of the party, to strengthen his position and that of the faction in order to dictate terms to the future king, or to reinstate James, Bolingbroke, yielding to his more impetuous and adventurous disposition, went much further than Oxford. It is possible to suppose a connexion between his zeal for making peace with France and a desire to forward the Pretender's interests or win support from the Jacobites.[3] During his diplomatic mission to France he had incurred blame for remaining at the opera while the Pretender was present,[4] and according to the Mackintosh transcripts he had several secret interviews with him. Regular communications were kept up subsequently. In March 1714 Herville, the French envoy in London, sent to Torcy, the French foreign minister in Paris, the substance of two long conversations with Bolingbroke in which the latter advised patience till after the accession of George, when a great reaction was to be expected in favour of the Pretender. At the same time he spoke of the treachery of Marlborough and Berwick, and of one other, presumably Oxford, whom he refused to name, all of whom were in communication with Hanover.[5] Both Oxford and Bolingbroke warned James that he could have little chance of success unless he changed his religion, but the latter's refusal (March 13) does not appear to have stopped the communications. Bolingbroke gradually superseded Oxford in the leadership. Lady Masham, the queen's favourite, quarrelled with Oxford and identified herself with Bolingbroke's interests. The harsh treatment of the Hanoverian demands was inspired by him, and won favour with the queen, while Oxford's influence declined; and by his support of the Schism Bill in May 1714, a violent Tory measure forbidding all education by dissenters by making an episcopal licence obligatory for schoolmasters, he probably intended to compel Oxford to give up the game. Finally, a charge of corruption brought by Oxford in July against Bolingbroke and Lady Masham, in connexion with the commercial treaty with Spain, failed, and the lord treasurer was dismissed or retired on the 27th of July.

Bolingbroke was now supreme, and everything appeared tending inevitably to a Jacobite restoration. The Jacobite Sir William Windham had been made chancellor of the exchequer, important military posts were placed in the hands of the faction, and a new ministry of Jacobites was projected. But now the queen's sudden death on the 1st of August, and the appointment of Shrewsbury to the lord treasurership, instantly changed the whole scene and ruined Bolingbroke. "The earl of Oxford was removed on Tuesday," he wrote to Swift on the 3rd of August, "the queen died on Sunday! What a world is this and how does fortune banter us!" According to Herville, the French envoy, Bolingbroke declared to him that in six weeks he could have secured everything. Nevertheless the exact nature of his projects remains obscure. It is probable that his statement in his letter to Windham that "none of us had any very settled resolution" is true, though his declaration in the *Patriot King* that "there were no designs on foot ... to place the crown on the head of the Pretender" is a palpable falsehood. His great object was doubtless to gain supreme power and to keep it by any means, and by any betrayal that the

circumstances demanded; and it is not without significance perhaps that on the very day of Oxford's dismissal he gave a dinner to the Whig leaders, and on the day preceding the queen's death ordered overtures to be made to the elector.[6]

On the accession of George I. the illuminations and bonfire at Lord Bolingbroke's house in Golden Square were "particularly fine and remarkable,"[7] but he was immediately dismissed from office. He retired to Bucklebury and is said to have now written the answer to the *Secret History of the White Staff* accusing him of Jacobitism. In March 1715 he in vain attempted to defend the late ministry in the new parliament; and on the announcement of Walpole's intended attack upon the authors of the treaty of Utrecht he fled in disguise (March 28, 1715) to Paris, where he was well received, after having addressed a letter to Lord Lansdowne from Dover protesting his innocence and challenging "the most inveterate of his enemies to produce any instance of his criminal correspondence." Bolingbroke in July entirely identified himself with the interests of the Pretender, whose secretary he became, and on the 10th of September he was attainted. But his counsel was neglected for that of ignorant refugees and Irish priests. The expedition of 1715 was resolved upon against his advice. He drew up James's declaration, but the assurances he had inserted concerning the security of the Church of England were cancelled by the priests. He remained at Paris, and endeavoured to establish relations with the regent. On the return of James, as the result of petty intrigues and jealousies, Bolingbroke was dismissed from his office. He now renounced all further efforts on the Pretender's behalf.[8] Replying to Mary of Modena, who had sent a message deprecating his ill-will, he wished his arm might rot off if he ever used pen or sword in their service again![9]

He now turned to the English government in hopes of pardon. In March 1716 he declared his final abandonment of the Pretender and promised to use his influence to secure the withdrawal of his friends; but he refused to betray any secrets or any individuals. He wrote his *Reflexions upon Exile*, and in 1717 his letter to Sir W. Windham in explanation of his position, generally considered one of his finest compositions, but not published till 1753 after his death. The same year he formed a liaison with Marie Claire Deschamps de Marcilly, widow of the marquis de Villette, whom he married in 1720 after the death in 1718 of Lady Bolingbroke, whom he had treated with cruel neglect. He bought and resided at the estate of La Source near Orleans, studied philosophy, criticized the chronology of the Bible, and was visited amongst others by Voltaire, who expressed unbounded admiration for his learning and politeness. In 1723, through the medium of the king's mistress, the duchess of Kendal, he at last received his pardon, returned to London in June or July, and placed his services at the disposal of Walpole, by whom, however, his offers to procure the accession of several Tories to the administration were received very coldly. During the following winter he made himself useful in France in gaining information for the government. In 1725 an act was passed enabling him to hold real estate but without power of alienating it.[10] But this had been effected in consequence of a peremptory order of the king, against Walpole's wishes, who succeeded in maintaining his exclusion from the House of Lords. He now bought an estate at Dawley, near Uxbridge, where he renewed his intimacy with Pope, Swift and Voltaire, took part in Pope's literary squabbles, and wrote the philosophy for the *Essay on Man*. On the first occasion which offered itself, that of Pulteney's rupture with Walpole in 1726, he endeavoured to organize an opposition in conjunction with the former and Windham; and in 1727 began his celebrated series of letters to the *Craftsman*, attacking the Walpoles, signed an "Occasional Writer." He gained over the duchess of Kendal with a bribe of £11,000 from his wife's estates, and with Walpole's approval obtained an audience with George. His success was imminent, and it was thought his appointment as chief minister was assured. In Walpole's own words, "as St John had the duchess entirely on his side I need not add what must or might in time have been the consequence," and he prepared for his dismissal. But once more Bolingbroke's "fortune turned rotten at the very moment it grew ripe,"[11] and his projects and hopes were ruined by the king's death in June.[12] Further papers from his pen signed "John Trot" appeared in the *Craftsman* in 1728, and in 1730 followed *Remarks on the History of England by Humphrey Oldcastle*, attacking the Walpoles' policy. The assault on the government prompted by Bolingbroke was continued in the House of Commons by Windham, and great efforts were made to establish the alliance between the Tories and the Opposition Whigs. The Excise Bill in 1733 and the Septennial Bill in the following year offered opportunities for further attacks on the government, which Bolingbroke supported by a new series of papers in the *Craftsman* styled "A Dissertation on Parties"; but the whole movement collapsed after the new elections, which returned Walpole to power in 1735 with a large majority.

Bolingbroke retired baffled and disappointed from the fray to France in June, residing principally at the château of Argeville near Fontainebleau. He now wrote his *Letters on the Study of History* (printed privately before his death and published in 1752), and the *True Use of Retirement*. In 1738 he visited England, became one of the leading friends and advisers of Frederick, prince of Wales, who now headed the opposition, and wrote for the occasion *The Patriot King*, which together with a previous essay, *The Spirit of Patriotism*, and *The State of Parties at the Accession of George I.*, were entrusted to Pope and not published. Having failed, however, to obtain any share in politics, he returned to France in 1739, and subsequently sold Dawley. In 1742 and 1743 he again visited England and quarrelled with Warburton. In 1744 he settled finally at Battersea with his friend Hugh Hume, 3rd earl of Marchmont, and was present at Pope's death in May. The discovery that the poet had printed secretly 1500 copies of *The Patriot King* caused him to publish a correct version in 1749, and stirred up a further altercation with Warburton, who defended his friend against Bolingbroke's bitter aspersions, the latter, whose conduct was generally reprehended, publishing a *Familiar Epistle to the most Impudent Man Living*. In 1744 he had been very busy assisting in the negotiations for the establishment of the new "broad bottom" administration, and showed no sympathy for the Jacobite expedition in 1745. He recommended the tutor for Prince George, afterwards George III. About 1749 he wrote the *Present State of the Nation*, an unfinished pamphlet. Lord Chesterfield records the last words heard from him: "God who placed me here will do what He pleases with me hereafter and He knows best what to do." He died on the 12th of December 1751, his wife having predeceased him in 1750. They were both buried in the parish church at Battersea, where a monument with medallions and inscriptions composed by Bolingbroke was erected to their memory.

The writings and career of Bolingbroke make a far weaker impression upon posterity than they made on contemporaries. His genius and character were superficial; his abilities were exercised upon ephemeral objects, and not inspired by lasting or universal ideas. Bute and George III. indeed derived their political ideas from *The Patriot King*, but the influence which he is said to have exercised upon Voltaire, Gibbon and Burke is very

problematical. Burke wrote his *Vindication of Natural Society* in imitation of Bolingbroke's style, but in refutation of his principles; and in the *Reflections on the French Revolution* he exclaims, "Who now reads Bolingbroke, who ever read him through?" Burke denies that Bolingbroke's words left "any permanent impression on his mind." Bolingbroke's conversation, described by Lord Chesterfield as "such a flowing happiness of expression that even his most familiar conversations if taken down in writing would have borne the press without the least correction," his delightful companionship, his wit, good looks, and social qualities which charmed during his lifetime and made firm friendships with men of the most opposite character, can now only be faintly imagined. His most brilliant gift was his eloquence, which according to Swift was acknowledged by men of all factions to be unrivalled. None of his great orations has survived, a loss regretted by Pitt more than that of the missing books of Livy and Tacitus, and no art perishes more completely with its possessor than that of oratory. His political works, in which the expression is often splendidly eloquent, spirited and dignified, are for the most part exceedingly rhetorical in style, while his philosophical essays were undertaken with the chief object of displaying his eloquence, and no characteristic renders writings less readable for posterity. They are both deficient in solidity and in permanent interest. The first deals with mere party questions without sincerity and without depth; and the second, composed as an amusement in retirement without any serious preparation, in their attacks on metaphysics and theology and in their feeble deism present no originality and carry no conviction. Both kinds reflect in their Voltairian superficiality Bolingbroke's manner of life, which was throughout uninspired by any great ideas or principles and thoroughly false and superficial. Though a libertine and a free-thinker, he had championed the most bigoted and tyrannical high-church measures. His diplomacy had been subordinated to party necessities. He had supported by turns and simultaneously Jacobite and Hanoverian interests. He had only conceived the idea of *The Patriot King* in the person of the worthless Frederick in order to stir up sedition, while his eulogies on retirement and study were pronounced from an enforced exile. He only attacked party government because he was excluded from it, and only railed at corruption because it was the corruption of his antagonists and not his own. His public life presents none of those acts of devotion and self-sacrifice which often redeem a career characterized by errors, follies and even crimes.

One may deplore his unfortunate history and wasted genius, but it is impossible to regret his exclusion from the government of England. He was succeeded in the title as 2nd Viscount Bolingbroke, according to the special remainder, by his nephew Frederick, 3rd Viscount St John (a title granted to Bolingbroke's father in 1716), from whom the title has descended.

BIBLIOGRAPHY.—Bolingbroke's collected works, including his chief political writings already mentioned and his philosophical essays *Concerning the Nature, Extent and Reality of Human Knowledge*, *On the Folly and Presumption of Philosophers*, *On the Rise and Progress of Monotheism*, and *On Authority in Matters of Religion*, were first published in Mallet's faulty edition in 1754,—according to Johnson's well-known denunciation, "the blunderbuss charged against religion and morality,"—and subsequently in 1778, 1809 and 1841. *A Collection of Political Tracts* by Bolingbroke was published in 1748. His *Letters* were published by G. Parke in 1798, and by Grimoard, *Lettres historiques, politiques, philosophiques, &c.*, in 1808; for others see Pope's and Swift's *Correspondence*; W. Coxe's *Walpole*; Phillimore's *Life of Lyttelton*; *Hardwick State Papers*, vol. ii.; *Marchmont Papers*, ed. by Sir G.H. Rose (1831); Letters to Lord Chancellor Hardwicke in *Add. MSS. Brit. Museum* (see Index, 1894-1899), mostly transcribed by W. Sichel; *Hist. MSS. Comm., MSS. of Marquis of Bath, Duke of Portland at Welbeck*; while a further collection of his letters relating to the treaty of Utrecht is in the British Museum. For his attempts at verse see Walpole's *Royal and Noble Authors* (1806), iv. 209 et seq. See also bibliography of his works in Sichel, ii. 456, 249.

A life of Bolingbroke appeared in his lifetime about 1740, entitled *Authentic Memoirs* (in the Grenville Library, Brit. Mus.), which recounted his escapades; other contemporary accounts were published in 1752 and 1754, and a life by Goldsmith in 1770. Of the more modern biographies may be noted that in the *Dict. of Nat. Biog.* by Sir Leslie Stephen, 1897; by C. de Remusat in *L'Angleterre au 18me siècle* (1856), vol. i.; by T. Macknight (1863); by J. Churton Collins (1886); by A. Hassall (1889); and by Walter Sichel (1901-1902), elaborate and brilliant, but unduly eulogistic.

(P. C. Y.)

1 Swift's *Inquiry into the Behaviour of the Queen's Last Ministry*; Mrs Delaney's *Correspondence*, 2 ser., iii. 168.

2 *Berwick's Mem.* (Petitot), vol. lxvi. 219.

3 *Hist. MSS. Comm., Portland MSS.* v. 235.

4 *Stuart MSS.* (Roxburghe Club), ii. 383.

5 *Hist. MSS. Comm., MSS. of H.M. the King, Stuart Papers*, i. p. xlviii.

6 Sichel's *Bolingbroke*, i. 340; *Lockhart Papers*, i. 460; Macpherson, ii. 529.

7 *Wentworth Papers*, 408.

8 *Hist. MSS. Comm., Stuart Papers*, i. 500; Berwick's *Mem.* (Petitot), vol. lxvi. 262.

9 Coxe's *Walpole*, i. 200; *Stuart Papers*, ii. 511, and also 446, 460.

10 *Hist. MSS. Comm., Onslow MSS.* 515.

11 Bolingbroke to Swift, June 24th, 1727. He adds, "to hanker after a court is below either you or me."

12 Sichel's *Bolingbroke*, ii. 267; *Stanhope*, ii. 163; *Hist. MSS. Comm., Onslow MSS.* 516, 8th Rep. Pt. III. App. p. 3. This remarkable incident is discredited by H. Walpole in *Letters* (ed. 1903), iii. 269; but he was not always well informed concerning his father's career.

BOLIVAR, SIMON (1783-1830), the hero of South American independence, was born in the city of Caracas, Venezuela, on the 24th of July 1783. His father was Juan Vicente Bolivar y Ponte, and his mother Maria

Concepcion Palacios y Sojo, both descended from noble families in Venezuela. Bolivar was sent to Europe to prosecute his studies, and resided at Madrid for several years. Having completed his education, he spent some time in travelling, chiefly in the south of Europe, and visited Paris, where he was an eye-witness of some of the last scenes of the Revolution. Returning to Madrid, he married, in 1801, the daughter of Don N. Toro, uncle of the marquis of Toro in Caracas, and embarked with her for Venezuela, intending, it is said, to devote himself to the improvement of his large estate. But the premature death of his young wife, who fell a victim to yellow fever, drove him again to Europe. Returning home in 1809 he passed through the United States, where, for the first time, he had an opportunity of observing the working of free institutions; and soon after his arrival in Venezuela he appears to have identified himself with the cause of independence which had already agitated the Spanish colonies for some years. Being one of the promoters of the insurrection at Caracas in April 1810, he received a colonel's commission from the revolutionary junta, and was associated with Louis Lopez Mendez in a mission to the court of Great Britain. Venezuela declared its independence on the 5th of July 1811, and in the following year the war commenced in earnest by the advance of Monteverde with the Spanish troops. Bolivar was entrusted with the command of the important post of Puerto Cabello, but not being supported he had to evacuate the place; and owing to the inaction of Miranda the Spaniards recovered their hold over the country.

Like others of the revolutionists Bolivar took to flight, and succeeded in reaching Curaçao in safety. He did not, however, remain long in retirement, but in September 1812, hearing of important movements in New Granada, repaired to Cartagena, where he received a commission to operate against the Spanish troops on the Magdalena river. In this expedition he proved eminently successful, driving the Spaniards from post to post, until arriving at the confines of Venezuela he boldly determined to enter that province and try conclusions with General Monteverde himself. His troops did not number more than 500 men; but, in spite of many discouragements, he forced his way to Merida and Truxillo, towns of some importance in the west of Venezuela, and succeeded in raising the population to his support. Forming his increased forces into two divisions, he committed the charge of one to his colleague Rivas, and pushing on for Caracas the capital, issued his decree of "war to the death." A decisive battle ensued at Lastoguanes, where the Spanish troops under Monteverde sustained a crushing defeat. Caracas was entered in triumph on the 4th of August 1813, and Monteverde took refuge in Puerto Cabello. General Mariño effected the liberation of the eastern district of Venezuela, and the patriots obtained entire possession of the country in January 1814. This success was, however, of very brief duration. The royalists, effectually roused by the reverses they had sustained, concentrated all their means, and a number of sanguinary encounters ensued. Bolivar was eventually defeated by Boves near Cura, in the plains of La Puerta, and compelled to embark for Cumana with the shattered remains of his forces. Caracas was retaken by the Spaniards in July; and before the end of the year 1814 the royalists were again the undisputed masters of Venezuela. From Cumana Bolivar repaired to Cartagena, and thence to Tunja, where the revolutionary congress of New Granada was sitting. Here, notwithstanding his misfortunes and the efforts of his personal enemies, he was received and treated with great consideration. The congress appointed him to conduct an expedition against Santa Fé de Bogota, where Don Cundinamarca had refused to acknowledge the new coalition of the provinces. In December 1814 he appeared before Bogota with a force of 2000 men, and obliged the recalcitrant leaders to capitulate,—a service for which he received the thanks of congress. In the meanwhile Santa Martha had fallen into the hands of the royalists, and Bolivar was ordered to the relief of the place. In this, however, he was not successful, General Morillo having landed an overwhelming Spanish force. Hopeless of the attempt he resigned his commission and embarked for Kingston, Jamaica, in May 1814. While residing there an attempt was made upon his life by a hired assassin, who, in mistake, murdered his secretary.

From Kingston Bolivar went to Aux Cayes in Haiti, where he was furnished with a small force by President Petion. An expedition was organized, and landed on the mainland in May 1816, but proved a failure. Nothing daunted, however, he obtained reinforcements at Aux Cayes, and in December landed first in Margarita, and then at Barcelona. Here a provisional government was formed, and troops were assembled to resist Morillo, who was then advancing at the head of a strong division. The hostile forces encountered each other on the 16th of February 1817, when a desperate conflict ensued, which lasted during that and the two following days, and ended in the defeat of the royalists. Morillo retired in disorder, and being met on his retreat by J.A. Paez with his *llaneros*, suffered an additional and more complete overthrow. Being now recognized as commander-in-chief, Bolivar proceeded in his career of victory, and before the close of the year had fixed his headquarters at Angostura on the Orinoco. At the opening of the congress which assembled in that city on the 15th February 1819 he submitted an elaborate exposition of his views on government, and concluded by surrendering his authority into the hands of congress. Being, however, required to resume his power, and retain it until the independence of the country had been completely established, he reorganized his troops, and set out from Angostura, in order to cross the Cordilleras, effect a junction with General Santander, who commanded the republican force in New Granada, and bring their united forces into action against the common enemy. This bold and original design was crowned with complete success. In July 1819 he entered Tunja, after a sharp action on the adjoining heights; and on the 7th of August he gained the victory of Boyaca, which gave him immediate possession of Bogota and all New Granada.

His return to Angostura was a sort of national festival. He was hailed as the deliverer and father of his country, and all manner of distinctions and congratulations were heaped upon him. Availing himself of the favourable moment, he obtained the enactment of the fundamental law of the 17th of December 1819, by which the republics of Venezuela and New Granada were henceforth to be united in a single state, under his presidency, by the title of the Republic of Colombia. The seat of government was also transferred provisionally to Rosario de Cucuta, on the frontier of the two provinces, and Bolivar again took the field. Being now at the head of the most numerous and best appointed army the republicans had yet assembled, he gained important advantages over the Spaniards under Morillo, and on the 25th of November 1820 concluded at Truxillo an armistice of six months, probably in the hope that the Spaniards would come to terms, and that the further effusion of blood might be spared. If such were his views, however, they were disappointed. Morillo was recalled, and General Torre assumed the command. The armistice was allowed to expire, and a renewal of the contest became inevitable. Bolivar therefore resolved, if possible, to strike a decisive blow; and this accordingly he did at Carabobo, where, encountering Torre, he so completely routed the Spaniards that the shattered remains of their army were forced to take refuge in Puerto Cabello, where two years after they surrendered to Paez. The battle of Carabobo may be considered as having put an end to the war in Venezuela. On the 29th of June 1821 Bolivar entered Caracas, and by the close of the year the Spaniards were driven from every part of

the province except Puerto Cabello. The next step was to secure, by permanent political institutions, the independence which had been so dearly purchased; and, accordingly, on the 30th of August 1821 the constitution of Colombia was adopted with general approbation, Bolivar himself being president, and Santander vice-president.

There was, however, more work for him to do. The Spaniards, though expelled from Colombia, still held possession of the neighbouring provinces of Ecuador and Peru; and Bolivar determined to complete the liberation of the whole country. Placing himself at the head of the army, he marched on Quito in Ecuador. A severe battle was fought at Pichincha, where, by the prowess of his colleague Sucre, the Spaniards were routed, and Quito was entered by the republicans in June 1822. Bolivar then marched upon Lima, which the royalists evacuated at his approach; and entering the capital in triumph, he was invested with absolute power as dictator, and authorized to call into action all the resources of the country. Owing, however, to the intrigues of the republican factions in Peru he was forced to withdraw to Truxillo, leaving the capital to the mercy of the Spaniards under Canterac, by whom it was immediately occupied. But this misfortune proved only temporary. By June 1824 the liberating army was completely organized; and taking the field soon after, it routed the vanguard of the enemy. Improving his advantage, Bolivar pressed forward, and on the 6th of August defeated Canterac on the plains of Junin, after which he returned to Lima, leaving Sucre to follow the royalists in their retreat to Upper Peru—an exploit which the latter executed with equal ability and success, gaining a decisive victory at Ayacucho, and thus completing the dispersion of the Spanish force. The possessions of the Spaniards in Peru were now confined to the castles of Callao, which Rodil maintained for upwards of a year, in spite of all the means that could be employed for their reduction. In June 1825 Bolivar visited Upper Peru, which, having detached itself from the government of Buenos Aires, was formed into a separate state, called Bolivia, in honour of the liberator. The first congress of the new republic assembled in August 1825, when Bolivar was declared perpetual protector, and requested to prepare for it a constitution of government.

His care was now directed to the administration of the affairs of the freed provinces. His endeavours to satisfy his countrymen in this respect did not always meet with encouragement, and sometimes exposed him to slander. In December 1824 Bolivar convoked a constituent congress for the February following; but this body, taking into consideration the unsettled state of the country, thought it proper to invest him with dictatorial power for another year. His project of a constitution for Bolivia was presented to the congress of that state on the 25th of May 1826, accompanied with an address, in which he embodied his opinions respecting the form of government which he conceived most expedient for the newly established republics. This code, however, did not give satisfaction. Its most extraordinary feature consisted in the provision for lodging the executive authority in the hands of a president for life, without responsibility and with power to nominate his successor, a proposal which alarmed the friends of liberty, and excited lively apprehensions amongst the republicans of Buenos Aires and Chile; whilst in Peru, Bolivar was accused of a design to unite into one state Colombia, Peru and Bolivia, and to render himself perpetual dictator of the confederacy.

In the meanwhile the affairs of Colombia had taken a turn which demanded the presence of Bolivar in his own country. During his absence Santander had administered the government of the state ably and uprightly, and its independence had been recognized by other countries. But Paez, who commanded in Venezuela, having been accused of arbitrary conduct in the enrolment of the citizens of Caracas in the militia, refused obedience to the summons of the senate, and placed himself in a state of open rebellion against the government, being encouraged by a disaffected party in the northern departments who desired separation from the rest of the republic.

Accordingly, having entrusted the government to a council nominated by himself, with Santa Cruz at its head, Bolivar set out from Lima in September 1826, and hastening to Bogota, arrived there on the 14th of November. He immediately assumed the extraordinary powers which by the constitution the president was authorized to exercise in case of rebellion. After a short stay in the capital he pressed forward to stop the effusion of blood in Venezuela, where matters had gone much farther than he could have contemplated. On the 31st of December he reached Puerto Cabello, and the following day he issued a decree offering a general amnesty. He had then a friendly meeting with Paez and soon after entered Caracas, where he fixed his headquarters, in order to check the northern departments, which had been the principal theatre of the disturbances. In the meanwhile Bolivar and Santander were re-elected to the respective offices of president and vice-president, and by law they should have qualified as such in January 1827. In February, however, Bolivar formally resigned the presidency of the republic, at the same time expressing a determination to refute the imputations of ambition which had been so freely cast upon him, by retiring into private life, and spending the remainder of his days on his patrimonial estate. Santander combated this proposal, urging him to resume his station as constitutional president, and declaring his own conviction that the troubles and agitations of the country could only be appeased by the authority and personal influence of the liberator himself. This view being confirmed by a resolution of congress, although it was not a unanimous one, Bolivar decided to resume his functions, and he repaired to Bogota to take the oaths. Before his arrival, however, he issued simultaneously three separate decrees—one granting a general amnesty, another convoking a national convention at Ocaña, and a third for establishing constitutional order throughout Colombia. His arrival was accelerated by the occurrence of events in Peru and the southern departments which struck at the very foundation of his power. Not long after his departure from Lima, the Bolivian code had been adopted as the constitution of Peru, and Bolivar had been declared president for life on the 9th of December 1826, the anniversary of the battle of Ayacucho. At this time the Colombian auxiliary army was cantoned in Peru, and the third division, stationed at Lima, consisting of veteran troops under Lara and Sands, became distrustful of Bolivar’s designs on the freedom of the republic. Accordingly, in about six weeks after the adoption of Bolivar’s new constitution, a counter-revolution in the government of Peru was effected by this body of dissatisfied veterans, and the Peruvians, availing themselves of the opportunity, abjured the Bolivian code, deposed the council appointed by the liberator, and proceeded to organize a provisional government for themselves. After this bloodless revolution the third division embarked at Callao on the 17th of March 1827, and landed in the southern department of Colombia in the following month. Intelligence of these events reached Bolivar while in the north of Colombia, and he lost no time in preparing to march against the refractory troops, who formerly had placed such implicit confidence in him. But he was spared the necessity of coming to blows, for the leaders, finding the government in the hands of the national executive, had peaceably submitted to General Ovando. In the meanwhile Bolivar had accepted the presidency, and resumed the functions belonging to his official position. But although Colombia was, to all external appearance, restored to

tranquillity, the nation was divided into two parties. Bolivar had, no doubt, regained the personal confidence of the officers and soldiers of the third division; but the republican party, with Santander at their head, continued to regard with undisguised apprehension his ascendancy over the army, suspecting him of a desire to imitate the career of Napoleon. In the meanwhile all parties looked anxiously to the convention of Ocaña, which was to assemble in March 1828, for a decided expression of the national will. The republicans hoped that the issue of its deliberations would be favourable to their views; whilst the military, on the other hand, did not conceal their conviction that a stronger and more permanent form of government was essential to the public welfare. The latter view seems to have prevailed. In virtue of a decree, dated Bogota, the 27th of August 1828, Bolivar assumed the supreme power in Colombia, and continued to exercise it until his death, which took place at San Pedro, near Santa Marta, on the 17th of December 1830.

Bolivar spent nine-tenths of a splendid patrimony in the service of his country; and although he had for a considerable period unlimited control over the revenues of three countries—Colombia, Peru and Bolivia—he died without a shilling of public money in his possession. He achieved the independence of three states, and called forth a new spirit in the southern portion of the New World. He purified the administration of justice; he encouraged the arts and sciences; he fostered national interests, and he induced other countries to recognize that independence which was in a great measure the fruit of his own exertions. His remains were removed in 1842 to Caracas, where a monument was erected to his memory; a statue was put up in Bogota in 1846; in 1858 the Peruvians followed the example by erecting an equestrian statue of the liberator in Lima; and in 1884 a statue was erected in Central Park, New York.

Twenty-two volumes of official documents bearing on Bolivar’s career were officially published at Caracas in 1826-1833. There are lives by Larrazabal (New York, 1866); Rojas (Madrid, 1883); and Ducoudray-Holstein (Paris, 1831). Two volumes of his correspondence were published in New York in 1866.

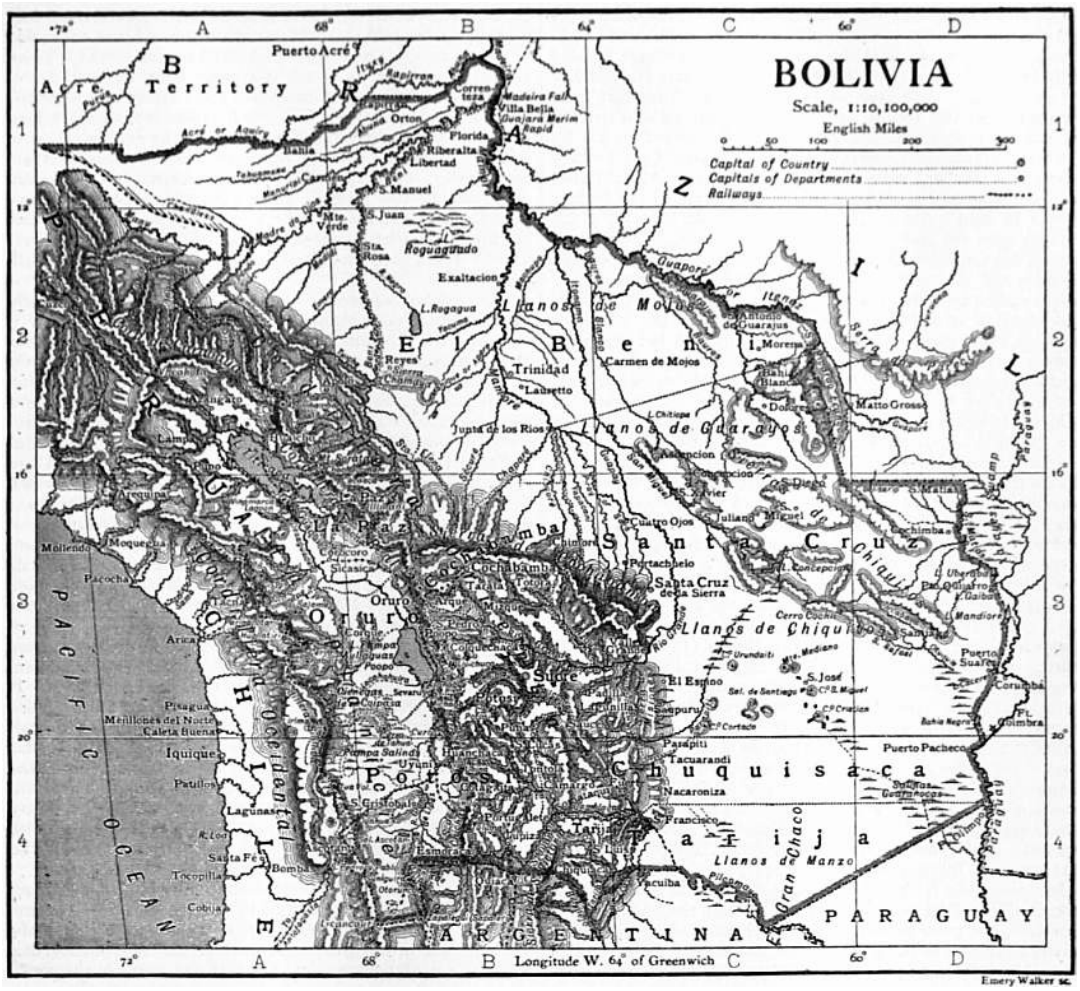
BOLÍVAR, till 1908 a department of Colombia, bounded N. and W. by the Caribbean Sea, E. by the departments of Magdalena and Santander, S. by Antioquia and S.W. by Cauca. It has an area of 27,028 sq. m., composed in great part of low, alluvial plains, densely wooded, but slightly cultivated and unsuited for north European labour. The population, estimated at 323,097 in 1899, is composed largely of mixed races; in some localities the inhabitants of mixed race are estimated to constitute four-fifths of the population. The capital, Cartagena on the Caribbean coast, was once the principal commercial entrepôt of Colombia. Other important towns are Barranquilla and Mompox (8000), on the Magdalena river, and Corozal (9000) and Lorica (10,596 in 1902), near the western coast.

BOLÍVAR, an inland state of Venezuela, lying S. of the Orinoco and Apure, with the Yuruari territory on the E., the Caroni river forming the boundary, and the Amazonas territory and Brazil on the S. Frequent political changes in Venezuela have led to various modifications in the size and outlines of this state, which comprises large areas of uninhabited territory. It is a country of extensive plains (*llanos*) covered in the rainy season with nutritious grass which disappears completely in the dry season, and of great forests and numerous rivers. Its population was given in 1894 as 135,232, but its area has been largely reduced since then. The capital is Ciudad Bolívar, formerly called Angostura, which is situated on the right bank of the Orinoco about 240 m. above its mouth; pop. 11,686. Vessels of light draught easily ascend the Orinoco to this point, and a considerable trade is carried on, the exports being cocoa, sugar, cotton, hides, jerked beef and various forest products.

BOLIVIA, an inland republic of South America, once a part of the Spanish vice-royalty of Peru and known as the province of Charcas, or Upper Peru. It is the third largest political division of the continent, and extends, approximately, from 9° 44′ to 22° 50′ S. lat., and from 58° to 70° W. long. It is bounded N. and E. by Brazil, S. by Paraguay and Argentina, and W. by Chile and Peru. Estimates of area vary widely and have been considerably confused by repeated losses of territory in boundary disputes with neighbouring states, and no figures can be given which may not be changed to some extent by further revisions. Official estimates are 640,226 and 703,633 sq. m., but Supan (*Die Bevolkerung der Erde*, 1904) places it at 515,156 sq. m.

Boundaries.—The boundary line between Bolivia and Brazil has its origin in the limits between the Spanish and Portuguese colonies determined by the treaties of Madrid and San Ildefonso (1750 and 1777), which were modified by the treaties of 1867 and 1903. Beginning at the outlet of Bahia Negra into the Paraguay river, lat. 28° 08′ 35″ S., the line ascends the latter to a point on the west bank 9 kilometres below Fort Coimbra, thence inland 4 kilometres to a point in lat. 19° 45′ 36″ S. and long. 58° 04′ 12.7″ W., whence it follows an irregular course N. and E. of N. to Lakes Mandioré, Gaiba or Gahiba, and Uberaba, then up the San Matias river and N. along the Sierra Ricardo Franco to the headwaters of the Rio Verde, a tributary of the Guaporé. This part of the boundary was turned inland from the Paraguay to include, within Brazilian jurisdiction, Fort Coimbra, Corumbá and other settlements on the west bank, and was modified in 1903 by the recession of about 1158 sq. m. to Bolivia to provide better commercial facilities on the Paraguay. The line follows the Verde, Guaporé, Mamoré and Madeira rivers down to the mouth of the Abuna, in about lat. 9° 44′ S., as determined by the treaty of 1903.

This is a part of the original colonial frontier, which extended down the Madeira to a point midway between the Beni and the Amazon, and then ran due W. to the Javary. The treaty of 1867 changed this starting-point to the mouth of the Beni, in lat. 10° 20′ S., and designated a straight line to the source of the Javary as the frontier, which gave to Brazil a large area of territory; but when the valuable rubber forests of the upper Purús became known the Brazilians invaded them and demanded another modification of the boundary line. This was finally settled in 1903 by the treaty of Petropolis, which provided that the line should ascend the Abuna river to lat. 10° 20′ S., thence along that parallel W. to the Rapirran river which is followed to its principal source, thence due W. to the Ituxy river which is followed W. to its source, thence to the source of Bahia Creek which is 167
followed to the Acré or Aquiry river, thence up the latter to its source, whence if east of the 69th meridian it runs direct to the 11th parallel which will form the boundary line to the Peruvian frontier. This frontier gave about 60,000 sq. m. of territory to Brazil, for which the latter gave an indemnity of £2,000,000 and about 1158 sq. m. of territory on the Matto Grosso frontier. The boundary with Paraguay is unsettled, but an unratified treaty of the 23rd of November 1894 provides that the line shall start from a point on the Paraguay river 3 m. north of Fort Olimpo and run south-west in a straight line to an intersection with the Pilcomayo in long. 61° 28′ W., where it unites with the Argentine boundary. The boundary with Chile was greatly modified by the results of the war of 1879-83, as determined by the treaties of 1884, 1886 and 1895, Bolivia losing her department of the littoral on the Pacific and all access to the coast except by the grace of the conqueror. Provisions were made in 1895 for the cession of the port of Mejillones del Norte and a right of way across the province of Tarapacá, but Peru protested, and negotiations followed for the cession of Cobija, in the province of Antofagasta. These negotiations proved fruitless, and in 1904 Bolivia accepted a pecuniary indemnity in lieu of territory. The new boundary line starts from the summit of the Sapaleri (or Zapalegui), where the Argentine, Bolivian and Chilean boundaries converge, and runs west to Licancaur, thence north to the most southern source of Lake Ascotán which it follows to and across this lake in the direction of the Oyahua volcano, and thence in a straight line to the Tua volcano, on the frontier of the province of Tarapacá. From this point the line follows the summits of the Cordillera Silillica north to the Cerro Paquiza, on the Tacna frontier, and to the Nevado Pomarape, near the frontier of Peru. Thence it continues north to an intersection with the Desaguadero, in about 16° 45′ S. lat., follows that river to the Winamarca lagoon and Lake Titicaca, and crosses the latter diagonally to Huaicho on the north shore. From this point the line crosses the Cordillera Real through the valley of the San Juan del Oro to Suches Lake, follows the Cololo and Apolobamba ranges to the headwaters of the Sina river, and thence down that stream to the Inambari. Thence the line either follows the latter to its confluence with the Madre de Dios, or the water-parting between that river and the Tambopata or Pando, to the valley of the Madre de Dios, from which point it runs due north to 12° 40′ S. lat., and north-west to the new Brazilian frontier. The N.W. angle on the map represents the Bolivian claim until the settlement of 1909, which gave the territory to Peru.



Physiography.—Roughly calculated, two-fifths of the total area of Bolivia is comprised within the Andean 168
cordilleras which cross its south-west corner and project east toward the Brazilian highlands in the form of a great obtuse angle. The Cordilleras, divided into two great parallel chains, with flanking ranges and spurs to the east, reach their greatest breadth at this point and form the *massif* of the Andean system. It is made up of a number of parallel ranges enclosing great elevated plateaus broken by transverse ranges and deep ravines. North-east of Lake Titicaca there is a confused mass or knot (the Nudo de Apolobamba) of lofty intersecting ridges which include some of the highest peaks in South America. Below this mountainous area the ranges open

out and enclose extensive plateaus. The western range, the Cordillera Occidental, a part of the boundary between Bolivia and the northern provinces of Chile, closely follows the coast outline and forms the western rampart of the great Bolivian tableland or *alta-planicie*, which extends from the Vilcanota knot in Peru, south to the Serrania de Lipez on the Argentine frontier, is 500 m. long, and about 80 m. broad, and contains about 40,000 sq. m. The northern part of this plateau is commonly called the *puna*; the southern part, the "desert of Lipez," in character and appearance is part of the great Puna de Atacama. This plateau has an average elevation of about 12,650 ft. near Lake Titicaca, but descends about 1000 ft. toward its southern extremity. It is a great lacustrine basin where once existed an inland sea having an outlet to the east through the La Paz gorge. The plateau is bleak and inhospitable in the north, barren and arid toward the south, containing great saline depressions covered with water in the rainy season, and broken by ridges and peaks, the highest being the Cerro de Tahua, 17,454 ft. Overlooking the plateau from the west are the snow-clad peaks of Pomarape (20,505 ft.), Parinacota (20,918 ft.), Sajama (21,047), Huallatiri (21,654), Lirima (19,128), and the three volcanic peaks, Oyahua (19,226), San Pedro y Pablo (19,423) and Licancaur (19,685). The eastern rampart of this great plateau is formed by the Cordillera Oriental, which extends north-west into Peru under the name of Carabaya, and south to the frontier in broken ranges, one of which trends south-east in the vicinity of Sucré. The main part of this great range, known as the Cordillera Real, and one of the most imposing mountain masses of the world, extends from the Peruvian border south-east to the 18th parallel and exhibits a series of snow-crowned peaks, notably the triple-crested Illampu or Sorata (21,490 ft.), Illimani (Conway, 21,204), Cacaaca (20,571) and Chachacomani (21,434). Of the ranges extending south from the Cordillera Real and branching out between the 18th and 19th parallels, the more prominent are the Frailes which forms the eastern rampart of the great central plateau and which is celebrated for its mineral deposits, the Chichas which runs south from the vicinity of Potosi to the Argentine frontier, and the Livichuco which turns south-east and forms the watershed between the Cachimayo and Pilcomayo. The more prominent peaks in and between these ranges are the Asanaque (16,857), Michaga (17,389), Cuzco (17,930), Potosi (15,381), Chorolque (18,480) and Tuluma (15,584). At the southern extremity of the great plateau is the transverse Serrania de Lipez, the culminating crest of which stands 16,404 ft. above sea-level. The eastern rampart of the Bolivian highlands comprises two distinct chains—the Sierra de Cochabamba on the north-east and the Sierra de Misiones on the east. Between these and the Cordillera Oriental is an apparently confused mass of broken, intersecting ranges, which on closer examination are found to conform more or less closely to the two outside ranges. These have been deeply cut by rivers, especially on the north-east, where the rainfall is heavier. The region enclosed by these ranges is extremely rugged in character, but it is esteemed highly for its fertile valleys and its fine climate, and is called the "Bolivian Switzerland." Lying wholly within the tropics, these mountain masses form one of the most interesting as well as one of the most imposing and difficult regions of the world. At their feet and in their lower valleys the heat is intense and the vegetation is tropical. Above these are cool, temperate slopes and valleys, and high above these, bleak, wind-swept passes and snow-clad peaks. West of the Cordillera Oriental, where special conditions prevail, a great desert plateau stretches entirely across one corner of the republic. Apart from the Andean system there is a group of low, broken, gneiss ranges stretching along the east side of Bolivia among the upper affluents of the Mamoré and Guaporé, which appear to belong to the older Brazilian orographic system, from which they have been separated by the erosive action of water. They are known as the Sierras de Chiquitos, and are geologically interesting because of their proximity to the eastern projection of the Andes. Their culminating point is Cerro Cochii, 3894 ft. above sea-level, but for the most part they are but little more than ranges of low wooded hills, having in general a north-west and south-east direction between the 15th and 19th parallels.

The popular conception of Bolivia is that of an extremely rugged mountainous country, although fully three-fifths of it, including the Chiquitos region, is composed of low alluvial plains, great swamps and flooded bottomlands, and gently undulating forest regions. In the extreme south are the Bolivian Chaco and the llanos (open grassy plains) of Manzo, while above these in eastern Chuquisaca and southern Santa Cruz are extensive swamps and low-lying plains, subject to periodical inundations and of little value for agricultural and pastoral purposes. There are considerable areas in this part of Bolivia, however, which lie above the floods and afford rich grazing lands. The great drawback to this region is defective drainage; the streams have too sluggish a current to carry off the water in the rainy season. Between the Chiquitos sierras and the Andes are the Llanos de Chiquitos, which have a higher general elevation and a more diversified surface. North of this elevation, which formed the southern shore of the ancient Mojos Lake, are the llanos of Guarayos and Mojos, occupying an extensive region traversed by the Guaporé, San Miguel, Guapay, Mamoré, Yacuma, Beni and Madre de Dios rivers and their numerous tributaries. It was once covered by the great Mojos Lake, and still contains large undrained areas, like that of Lake Rojoagua (or Roguaguado). It contains rich agricultural districts and extensive open plains where cattle-raising has been successfully followed since the days of the Jesuit missions in that region. The lower slopes of the Andes, especially toward the north-west, where the country is traversed by the Beni and Madre de Dios, are covered with heavy forests. This is one of the richest districts of Bolivia and is capable of sustaining a large population.

The river-systems of Bolivia fall naturally into three distinct regions—the Amazon, La Plata and Central Plateau. The first includes the rivers flowing directly and indirectly into the Madeira, one of the great tributaries of the Amazon, together with some small tributaries of the Acré and Purús in the north, all of which form a drainage basin covering more than one-half of the republic. The two principal rivers of this system are the Mamoré and Beni, which unite in lat. 10° 20′ S. to form the Madeira. The Mamoré, the upper part of which is called the Chimoré, rises on the north-east slopes of the Sierra de Cochabamba a little south of the 17th parallel, and follows a northerly serpentine course to its confluence with the Beni, the greater part of which course is between the 65th and 66th meridians. The river has a length of about 600 m., fully three-fourths of which, from Chimoré (925 ft. above sea level) to the rapids near its mouth, passes across a level plain and is navigable. The principal Bolivian tributary of the Mamoré, the Guapay or Grande, which is larger and longer than the former above their confluence and should be considered the main stream, rises in the Cordillera Oriental east of Lake Pampa Aullaguas, and flows east to the north extremity of the Sierra de Misiones, where it emerges upon the Bolivian lowlands. Turning to the north in a magnificent curve, it passes around the south-east extremity of the Sierra de Cochabamba, skirts the Llanos de Chiquitos, and, turning to the north-west, unites with the Mamoré at Junta de los Rios in about 15° 20′ S. lat. and 64° 40′ W. long. It has a tortuous course of over 700 m., which is described as not navigable. The principal tributaries of the Guapay are the Mizque, Piray or Sará and Yapacani, the last rising on the east slopes of the Cordillera Real, flowing east by

Cochabamba to the sierras of that name where it breaks through with a great bend to the north. The other large Bolivian tributaries of the Mamoré, all rising on the north-east flanks of the Andes, are the Chaparé, Sécure, Manique or Aperé and Yacuma, the last draining a region of lakes and swamps north of the Sierra Chamaya. The Beni and its great affluent, the Madre de Dios, though of smaller volume and extent than the Mamoré, are of much greater economic importance, owing to their navigability, the fertility of the region they drain, and the great forests along their banks. North of the Beni, the Abuna flows into the Madeira. Several of its south tributaries belong to Bolivia. The Guaporé, or Itenez, an affluent of the Mamoré, is the third large river of this Bolivian drainage basin, but it rises in Brazil, on the south slopes of the Sierra dos Parecis, where it flows in a great bend to the south and then west of north to the Bolivian frontier in 14° S. lat. From this point to its junction with the Mamoré, a little north of the 12th parallel, it flows in a northwesterly direction and forms the boundary line between the two republics. Its Brazilian tributaries are comparatively unimportant, but from Bolivia it receives the Baures and the San Miguel, both rising in the Sierras de Chiquitos and flowing north-west across the llanos to the Guaporé. The Baures has one large tributary, the Blanco, and the Itonama (San Miguel) has its origin in Lake Conception, lying among the west ranges of the Chiquitos mountains 952 ft. above sea-level.

The south-east drainage basin, which is smaller and economically less important than that of the Madeira, discharges into the Paraguay and extends from the Sierras de Chiquitos south to the Argentine frontier, and from the Cordillera Oriental east to the Paraguay. It possesses only one large river in Bolivia, the Pilcomayo, which rises on the east slopes of the Cordillera Oriental opposite the south end of Lake Pampa Aullaguas and flows east and south-east through the sierra region to the Bolivian Chaco. It flows through a nearly level country with so sluggish a current that its channels are greatly obstructed. Nothing definite is known of its tributaries in the Chaco, but in the sierra region it possesses a number of small tributaries, the largest of which are the Cachimayo, Mataca and Pílaya or Camblaya, the latter formed by the Cotagaita and San Juan. The Bermejo, which is an Argentine river, receives one large tributary from the Bolivian uplands, the Tarija or Rio Grande, which drains a small district south-east of the Santa Victoria sierra. The Bolivian tributaries of the upper Paraguay are small and unimportant. The Otuquis, the most southern of the group, is formed by the San Rafael and Tucabaca, which drain both slopes of the Cerro Cochii range; but is lost in some great marshes 50 m. from the Paraguay. Another considerable stream of this region, which is lost in the great marshy districts of the Bolivian plain, is the Parapiti, which rises on the eastern slopes of the Sierra de Misiones and flows north-east through a low plain for about 150 m. until lost.

The third drainage basin is that of the great central plateau, or *alta-planicie*. This is one of the most elevated lacustrine basins in the world, and though it once drained eastward, now has no surface outlet. Lake Titicaca receives the waters of several short streams from the neighbouring heights and discharges through the Desaguadero, a sluggish river flowing south for 184 m. with a gradually diminishing depth to Lake Pampa Aullaguas or Poopo. The Desaguadero is navigable for small craft, and has two or three small tributaries from the west. Two small streams empty into Lake Pampa Aullaguas, which has a small outlet in the Lacahahuira flowing west for 60 m. to the Cienegas de (salt-swamps of) Coipasa. The drainage of this extensive district seems to be wholly absorbed by the dry soil of the desert and by evaporation. In the extreme south the Rio Grande de Lipez is absorbed in the same way.

Few of the Bolivian lakes are at all well known. The great lacustrine basin between the Beni and the Mamoré contains several lakes and lagoons, two of them of large size. These are Lake Rogagua whose waters find their way into the Beni through Rio Negro, and the Roguaguado lagoon and marshes which cover a large area of territory near the Mamoré. The latter has an elevation little, if any, above the level of the Mamoré, which apparently drains this region, and its area has been estimated at about 580 sq. m. Lake Conceptión, in the Chiquitos mountains, belongs to this same hydrographic area. In the south-east there are several large shallow lakes whose character and size change with the season. They fill slight depressions and are caused by defective drainage. Near the Paraguay there are several of these lakes, partly caused by obstructed outlets, such as Bahia Negra, Cáceres, Mandioré, Gaiba and Uberaba, some of them of sufficient depth to be navigable by small craft. Above the latter are the great Xarayes swamps, sometimes described as a lake. This region, like that of the north, is subject to periodical inundations in the summer months (November-March or even May), when extensive areas of level country are flooded and traffic is possible only by the use of boats. The two principal lakes of the plateau region are Titicaca and Pampa Aullaguas or Poopo. The former lies near the north end of the great Bolivian *alta-planicie*, 12,644 ft. above sea-level, being one of the most elevated lakes of the world. It is indented with numerous bays and coves; its greatest length is 138 m., and its greatest breadth 69 m. According to a survey made by Dr M. Neveau-Lemaire (*La Geographie*, ix. p. 409, Paris, 1904), its water surface, excluding islands and peninsulas, is 1969 sq. m., and its greatest depth is 892 ft. The level of the lake rises about 5 in. in summer; the loss in winter is even greater. The lake belongs to both Bolivia and Peru, and is navigated by steamers running between Bolivian ports and the Peruvian railway port of Puno. The outlet of the lake is through the Desaguadero river. It has several islands, the largest of which bears the same name and contains highly interesting archaeological monuments of a prehistoric civilization usually attributed to the Incas. Lake Pampa Aullaguas or Poopo is about 180 m. south-east of Titicaca, and is fed principally by its outflow. It lies 505 ft. below the level of Titicaca, which gives an average fall for the Desaguadero of very nearly 2¾ ft. per mile. The Pampa Aullaguas has an estimated area of 386 sq. m., and has one large inhabited island. The lake is shallow and the district about it is sparsely populated. Its outlet is through the Lacahahuira river into the Coipasa swamp, and it is estimated that the outflow is much less than the inflow, showing a considerable loss by evaporation and earth absorption.

Having no sea-coast, Bolivia has no seaport except what may be granted in usufruct by Chile.

Geology.—The eastern ranges of ihe Bolivian Andes are formed of Palaeozoic rocks with granitic and other intrusions; the Western Cordillera consists chiefly of Jurassic and Cretaceous beds, together with the lavas and ashes of the great volcanoes; while the intervening plateau is covered by freshwater and terrestrial deposits through which rise ridges of Palaeozoic rock and of a series of red sandstones and gypsiferous marls of somewhat uncertain age (probably, in part at least, Cretaceous). The Palaeozoic beds have yielded fossils of Cambrian, Ordovician, Devonian and Carboniferous age. In southern Bolivia Cambrian and Ordovician beds form the greater part of the eastern Andes, but farther north the Devonian and Carboniferous are extensively developed, especially in the north-eastern ranges. The hills, known as the Chiquitos, which rise from the plains of eastern Bolivia, are composed of ancient sedimentary rocks of unknown age. The Palaeozoic beds are directly

overlaid by a series of red sandstones and gypsiferous marls, similar to the *formacion petrolifera* of Argentina and Brazil. At the base there is frequently a conglomerate or tuff of porphyritic rocks. Marine fossils found by Gustav Steinmann in the middle of the series are said to indicate an age not earlier than the Jurassic, and Steinmann refers them to the Lower Cretaceous. It is, however, not improbable that the series may represent more than one geological system. No later marine deposits have been found either in the eastern Andes or in the plains of Bolivia, but freshwater beds of Tertiary and later date occupy a wide area. The recent deposits, which cover so large a part of the depression between the Eastern and the Western Cordillera, appear to be partly of torrential origin, like the talus-fans at the foot of mountain ranges in other dry regions; but Lakes Titicaca and Pampa Aullaguas (Poopo) were undoubtedly at one time rather more extensive than they are to-day. The volcanoes of Bolivia lie almost entirely in the Western Cordillera—the great summits of the eastern range, such as Illimani and Sorata, being formed of Palaeozoic rocks with granitic and other intrusions. The gold, silver and tin of Bolivia occur chiefly in the Palaeozoic rocks of the eastern ranges. The copper belongs mostly to the red sandstone series.

Climate.—Bolivia lies wholly within the torrid zone, and variations in temperature are therefore due to elevation, mountain barriers and prevailing winds. The country possesses every gradation of temperature, from that of the tropical lowlands to the Arctic cold of the snow-capped peaks directly above. This vertical arrangement of climatic zones is modified to some extent (less than in Argentina) by varying rainfall conditions, which are governed by the high mountain ranges crossing one corner of the republic, and also by the prevailing winds. The trade winds give to S. Bolivia a wet and dry season similar to that of N. Argentina. Farther north, and east of the Cordillera Oriental, rains fall throughout the year, though the summer months (November-March) are usually described as the rainy season. On the west side of the Cordillera, which extracts the moisture from the prevailing easterly winds, the elevated plateaus have a limited rainfall in the north, which diminishes toward the south until the surface becomes absolutely barren. Brief and furious rain-storms sometimes sweep the northern plateau, but these are not frequent and occur during a short season only. Electrical wind storms are frequent in these high altitudes.

Bolivia has a wide range of temperature between places of the same latitude. The natives designate the Bolivian climatic zones as *yungas, valle* or *medio yungas, cabezera de valle, puna* and *puna brava*. The *yungas* comprises all the lowlands and the mountain valleys up to an elevation of 5000 ft. The temperature is tropical, winter is unknown and the atmosphere is exceedingly humid. The mean temperature, according to official estimates, is 70° F., but this probably represents the average between the higher elevations and the low country. The *valle* zone includes the deep valleys from 5000 to 9500 ft., has a warm climate with moderate variations in temperature and no cold weather, is sub-tropical in character and productions, and is sometimes described as a region of perpetual summer. The *cabezera de valle*, as the name indicates, includes the heads of the deep valleys above the *valle* zone, with elevations ranging from 9500 to 11,000 ft.; its climate is temperate, is divided into regular seasons, and is favourable to the production of cereals and vegetables. The *puna*, which lies between 11,000 and 12,500 ft., includes the great central plateau of Bolivia. It has but two seasons, a cold summer or autumn and winter. The air is cold and dry, and the warmer season is too short for the production of anything but potatoes and barley. The mean temperature is officially estimated as 54° F. The *puna brava* extends from 12,500 ft. up to the snow limit (about 17,500 ft.), and covers a bleak, inhospitable territory, inhabited only by shepherds and miners. Above this is the region of eternal snow, an Arctic zone within the tropics. In general, the sub-tropical (*valle*) and temperate (*cabezera de valle*) regions of Bolivia are healthy and agreeable, have a plentiful rainfall, moderate temperature in the shade, and varied and abundant products. There is a high rate of mortality among the natives, due to unsanitary habits and diet, and not to the climate. In the tropical *yungas* the ground is covered with decaying vegetation, and malaria and fevers are common. There are localities in the open country and on exposed elevations where healthy conditions prevail, but the greater part of this region is considered unhealthy. The prevailing winds are easterly, bringing moisture across Brazil from the Atlantic, but eastern Bolivia is also exposed to hot, oppressive winds from the north, and to violent cold winds (*surazos*) from the Argentine plains, which have been known to cause a fall of temperature of 36° within a few hours. According to the *Sinópsis Estadistica y Geográfica de la República de Bolivia* (La Paz, 1903), the average mean temperature and the annual rainfall in eastern Bolivia are as follows: 10° S. lat., 90.8° F. and 31.5 in. rainfall; 15° S. lat., 86° F. and 30.7 in. rainfall; 20° S. lat., 81° F. and 30 in. rainfall; and 25° S. lat., 76.8° F. and 29.3 in. rainfall.

Fauna.—The indigenous fauna of Bolivia corresponds closely to that of the neighbouring districts of Argentina, Brazil and Peru. Numerous species of monkeys inhabit the forests of the tropical region, together with the puma, jaguar, wildcat, coati, tapir or *anta*, sloth, ant-bear, paca (*Coelogenys paca*) and capybara. A rare species of bear, the *Ursus ornatus* (spectacled bear) is found among the wooded Andean foothills. The chinchilla (*C. laniger*), also found in northern Argentina and Chile, inhabits the colder plateau regions and is prized for its fur. The plateau species of the viscacha (*Lagidium cuvieri*) and the widely distributed South American otter (*Lutra paranensis*) are also hunted for their skins. The peccary, which prefers a partially open country, ranges from the Chaco to the densely wooded districts of the north. There are two or three species of deer, the most common being the large marsh deer of the Chaco; but the deer are not numerous. The armadillo, opossum, ferret and skunk are widely distributed. The amphibia are well represented throughout the lower tropical districts. Alligators are found in the tributaries of the Paraguay and their lagoons, lizards and turtles are numerous, and the batrachians are represented by several species. Snakes are also numerous, including rattlesnakes and the great boa-constrictors of the Amazon region.

The most interesting of all the Bolivian animals, however, are the guanaco (*Auchenia huanaco*) and its congeners, the llama (*A. llama*), alpaca (*A. pacos*) and vicuña (*A. vicugna*), belonging to the Camelidae, with the structure and habits of the African camel, but smaller, having no hump, and inhabiting a mountainous and not a level sandy region. They are able to go without food and drink for long periods, and inhabit the arid and semi-arid plateaus of the Andes and the steppes of Patagonia. The guanaco is supposed to be the original type, is the largest of the four, and has the greatest range from Peru to Tierra del Fuego. The llama and alpaca were domesticated long before the discovery of America, but the guanaco and vicuña are found in a wild state only. The llama is used as a pack animal in Bolivia and Peru, and its coarse wool is used in the making of garments for the natives. The alpaca is highly prized for its fine wool, which is a staple export from Bolivia, but the animal is reared with difficulty and the product cannot be largely increased. The vicuña also is celebrated for its wool, which the natives weave into beautiful and costly *ponchos* (blanket cloaks) and other wearing apparel. The guanaco is hunted for its skin, which, when dressed, makes an attractive rug or robe. The slaughter of the

guanaco and vicuña is rapidly diminishing their number. The rearing of llamas and alpacas is a recognized industry in the Bolivian highlands and is wholly in the hands of the Indians, who alone seem to understand the habits and peculiarities of these interesting animals.

Of birds and insects the genera and species are very numerous and interesting. The high sierras are frequented by condors and eagles of the largest size, and the whole country by the common vulture, while the American ostrich (*Rhea americanus*) and a species of large stork (the *bata* or *jaburú*, *Mycteria americana*; maximum height, 8 ft.; spread of wings, 8 ft. 6 in.) inhabit the tropical plains and valleys. Waterfowl are numerous and the forests of the warm valleys are filled with song-birds and birds of beautiful plumage. Many species of humming-birds are found even far up in the mountains, and great numbers of parrots, araras and toucans, beautiful of feather but harsh of voice, enliven the forests of the lowlands.

Like other South American states, Bolivia benefited greatly from the introduction of European animals. Horses, cattle, sheep, goats, swine and poultry were introduced, and are now sources of food and wealth to a large part of the population. Mules are used to a large extent as pack animals, but they are imported from Argentina. Silkworms have been bred with success in some departments, and the cochineal insect is found wherever the conditions are favourable for the cactus.

Flora.—Owing to the diversities in altitude the flora of Bolivia represents every climatic zone, from the scanty Arctic vegetation of the lofty Cordilleras to the luxuriant tropical forests of the Amazon basin. Between these extremes the diversity in vegetable life is as great as that of climate and soil. The flora of Bolivia has been studied less than the flora of the neighbouring republics, however, because of the inaccessibility of these inland regions. Among the more important productions, the potato, oca (*Oxalis tuberosa*), quinoa (*Chenopodium quinoa*) and some coarse grasses characterize the puna region, while barley, an exotic, is widely grown for fodder. Indian corn was cultivated in the temperate and warm regions long before the advent of Europeans, who introduced wheat, rye, oats, beans, pease and the fruits and vegetables of the Old World, for each of which a favourable soil and climate was easily found. In the sub-tropical and tropical zones the indigenous plants are the sweet potato, cassava (*Manihot utilissima* and *M. aipi*), peanuts, pineapple, guava, chirimoya (*Anona cherimolia*), pawpaw (*Carica papaya*), *ipecacuanha* (*Cephaelis*), sarsaparilla, vanilla, false jalap (*Mirabilis jalapa*), copaiba, tolu (*Myroxylon toluiferum*), rubber-producing trees, dyewoods, cotton and a great number of beautiful hardwoods, such as jacarandá, mahogany, rosewood, quebracho, colo, cedar, walnut, &c. Among the fruits many of the most common are exotics, as the orange, lemon, lime, fig, date, grape, &c., while others, as the banana, cajũ or cashew (*Anacardium occidentale*) and aguacate avocado or alligator pear, have a disputed origin. Coca, one of the most important plants of the country, is cultivated on the eastern slopes of the Andes at an altitude of 5000 to 6000 ft., where the temperature is uniform and frosts are unknown. Quina or calisaya is a natural product of the eastern Andes, and is found at an altitude of 3000 to 9000 ft. above sea-level. The calisaya trees of Bolivia rank among the best, and their bark forms an important item in her foreign trade. The destructive methods of collecting the bark are steadily diminishing the natural sources of supply, and experiments in cinchona cultivation were undertaken during the last quarter of the 19th century, with fair prospects of success. The most important of the indigenous forest products, however, is rubber, derived principally from the *Hevea guayanensis* (var. *brasiliensis*), growing along the river courses in the *yungas* regions of the north, though Maniçoba rubber is also obtained from *Manihot Glaziovii* on the drier uplands. Among the exotics, sugar-cane, rice and tobacco are cultivated in the warm districts.

Population.—The population of Bolivia is composed of Indians, Caucasians of European origin, and a mixture of the two races, generally described as *mestizos*. There is also a very small percentage of Africans, descendants of the negro slaves introduced in colonial times. A roughly-taken census of 1900 gives the total population as 1,816,271, including the Litoral department, now belonging to Chile (49,820), and estimates the number of wild Indians of the forest regions at 91,000. Of this total, 50.7% were classed as Indians, 12.8% as whites, 26.8% as *mestizos*, 0.3% as negroes, and 9.4% as unknown. In 1904 an official estimate made the population 2,181,415, also including the Litoral (59,784), but of course all census returns and estimates in such a country are subject to many allowances. The Indian population (920,860) is largely composed of the so-called civilized tribes of the Andes, which once formed part of the nationality ruled by the Incas, and of those of the Mojos and Chiquitos regions, which were organized into industrial communities by the Jesuits in the l7th century. The former, which are chiefly Aymarás south of the latitude of Lake Titicaca, attained a considerable degree of civilization before the discovery of America and have been in closer contact with Europeans than the other tribes of Bolivia. It is doubtful, however, whether their condition has been improved under these influences. The Mojos and Chiquitos tribes, also, have been less prosperous since the expulsion of the Jesuits, but they have remained together in organized communities, and have followed the industries and preserved the religion taught them as well as circumstances permitted. Both these groups of Indians are peaceable and industrious, and form an important labouring element. They are addicted to the excessive use of *chica* (a native beer made from Indian corn), and have little or no ambition to improve their condition, but this may be attributed in part to their profound ignorance and to the state of peonage in which they are held. Inhabiting the southern part of the Bolivian plain are the Chiriguanos, a detached tribe of the Guarani race which drifted westward to the vicinity of the Andes long ago. They are of a superior physical and mental type, and have made noteworthy progress toward civilization. They are agriculturists and stock-raisers and have the reputation of being peaceable and industrious. The remaining native tribes under the supervision of the state have made little progress, and their number is said to be decreasing (notwithstanding the favourable climatic conditions under which most of them live) because of unsanitary and intemperate habits, and for other causes not well understood, one being the custom noticed by early travellers among some of the tribes of the La Plata region of avoiding the rearing of children. (See Southey's *History of Brazil*, iii. pp. 402, 673.) Of the wild Indians very little is known in regard to either numbers or customs.

The white population (231,088) is descended in great part from the early Spanish adventurers who entered the country in search of mineral wealth. To these have been added a small number of Spanish Americans from neighbouring republics and some Portuguese Americans from Brazil. There has been no direct immigration from Europe, though Europeans of various nationalities have found their way into the country and settled there as miners or traders. The percentage of whites therefore does not increase as in Argentina and Brazil, and cannot until means are found to promote European immigration.

The *mestizos* (486,018) are less numerous than the Indians, but outnumber the whites by more than two to

one. It has been said of the *mestizos* elsewhere that they inherit the vices of both races and the virtues of neither. Yet, with a decreasing Indian population, and with a white population wanting in energy, barely able to hold its own and comprising only one-eighth of the total, the future of Bolivia mainly depends on them. As a rule they are ignorant, unprogressive and apathetic, intensely superstitious, cruel and intemperate, though individual strong characters have been produced. It may be that education and experience will develop the *mestizos* into a vigorous progressive nationality, but the first century of self-government can hardly be said to have given much promise of such a result.

Divisions and Towns.—The republic is divided into eight departments and one territory, and these are subdivided into 54 provinces, 415 cantons, 232 vice-cantons, 18 missions and one colony. The names, areas and populations of the departments, with their capitals, according to the census of 1900, to which corrections must be made on account of the loss of territory to Brazil in 1903, are as follows:—

Department.	Area sq. m. from Official Sources.	Population 1900.*	Capitals.	Population 1900.
La Paz	53,777	445,616	La Paz	54,713
El Beni	102,111	32,180	Trinidad	2,556
Oruro	19,127	86,081	Oruro	13,575
Cochabamba	23,328	328,163	Cochabamba	21,886
Santa Cruz	141,368	209,592	Santa Cruz de la Sierra	15,874
Potosi	48,801	325,615	Potosi	20,910
Chuquisaca	26,418	204,434	Sucré	20,967
Tarija	33,036	102,887	Tarija	6,980
Nat. Territory	192,260	31,883		
	640,226	1,766,451		

* The figures for population include a 5% addition for omissions, sundry corrections and the estimated number of wild Indians.

The total area according to Gotha computations, with corrections for loss of territory to Brazil in 1903, is 515,156 sq. m.

There are no populous towns other than the provincial capitals above enumerated. Four of these capitals—Sucré or Chuquisaca, La Paz, Cochabamba and Oruro—have served as the national capital, and Sucré was chosen, but after the revolution of 1898 the capital was at La Paz, which is the commercial metropolis and is more accessible than Sucré. Among the smaller towns prominent because of an industry or commercial position, may be mentioned the Huanchaca mining centre of Pulacayo (pop. 6512), where 3200 men are employed in the mines and surface works of this great silver mining company; Uyuni (pop. 1587), the junction of the Pulacayo branch with the Antofagasta and Oruro railway, and also the converging point for several important highways and projected railways; and Tupiza (pop. 1644), a commercial and mining centre near the Argentine frontier, and the terminus of the Argentine railway extension into Bolivia. All these towns are in the department of Potosi. Viacha (pop. 1670), a small station on the railway from Guaqui to Alto de La Paz, 14 m. from the latter, is the starting point of an important projected railway to Oruro. In the department of Cochabamba, Tarata (4681) and Totora (3501) are two important trading centres, and in the department of Santa Cruz, Ascensión (pop. 4784) is a large mission station in the Chiquitos hills.

Communications.—Under a treaty with Brazil in 1903 and with Chile in 1904 (ratified 1905) provisions were made for railway construction in Bolivia to bring this isolated region into more effective communication with the outside world. Brazil agreed to construct a railway around the falls of the Madeira (about 180 m. long) to give north-eastern Bolivia access to the Amazon, and paid down £2,000,000 in cash which Bolivia was to expend on railway construction within her own territory. Chile also agreed to construct a railway from Arica to La Paz, 295 m. (the Bolivian section becoming the property of Bolivia fifteen years after completion), and to pay the interest (not over 5%) which Bolivia might guarantee on the capital invested in certain interior railways if constructed within thirty years, providing these interest payments should not exceed £100,000 a year, nor exceed £1,600,000 in the aggregate. Argentina had already undertaken to extend her northern railway from Jujuy to the Bolivian frontier town of Tupiza, and the Peruvian Corporation had constructed for the Bolivian government a short line (54 m. long) from Guaqui, on Lake Titicaca, to Alto de La Paz, which is connected with the city of La Paz, 1493 ft. below, by an electric line 5 m. long. This line gives La Paz access to the Peruvian port of Mollendo, 496 m. distant, and promises in time to give it railway communication with Cuzco. Rivalry for the control of her trade, therefore, promises to give Bolivia the railways needed for the development of her resources. Up to 1903 the only railways in Bolivia were the Antofagasta and Oruro line, with a total length of 574 m., of which 350 m. are within Bolivian territory, a private branch of that line (26 m. long) running to the Pulacayo mines, and the line (54 m. long) from Guaqui to Alto de La Paz—a total of only 430 m. As a result of her war with Chile in 1878-81, the railways (282 m. long) of her Litoral department passed under Chilean control. Lines were in 1907 projected from La Paz to the navigable waters of the Beni, from La Paz to Cochabamba, from Viacha to Oruro, from Uyuni to Potosi and Sucré, from Uyuni to Tupiza, and from Arica to La Paz via Corocoro. The central northern line of the Argentine government was completed to the Bolivian frontier in 1908, and this line was designed to extend to Tupiza. The undertaking of the Arica-La Paz line by the Chilean government, also, was an important step towards the improvement of the economic situation in Bolivia. Both these lines offer the country new outlets for its products.

Public highways have been constructed between the large cities and to some points on the frontiers, and subsidized stage coaches are run on some of them. The roads are rough and at times almost impassable, however, and the river crossings difficult and dangerous. The large cities are connected with one another by telegraph lines and are in communication with the outside world through Argentina, Chile and Peru. Telegraph service dates from 1880, and in 1904 there were 3115 m. in operation, of which 1936 belonged to the state and 1179 to private corporations. The latter includes the lines belonging to the Antofagasta and Oruro railway, which are partly within Chilean territory. Bolivia is a member of the International Postal Union, and has parcel and money order conventions with some foreign countries. Special agreements have been made, also, with Argentina, Chile and Peru for the transmission of the Bolivian foreign mails.

The loss of her maritime department has left Bolivia with no other ports than those of Lake Titicaca (especially Guaqui, or Huaqui, which trades with the Peruvian port of Puno), and those of the Madeira and Paraguay rivers and their affluents. As none of these can be reached without transhipment in foreign territory, the cost of transport is increased, and her neighbours are enabled to exclude Bolivia from direct commercial intercourse with other nations. An exception formerly existed at Puerto Acré, on the Acré river, to which ocean-going steamers could ascend from Pará, but Brazil first closed the Purús and Acré rivers to foreign vessels seeking this port, and then under a treaty of 1903 acquired possession of the port and adjacent territory. Since then Bolivia's outlet to the Amazon is restricted to the Madeira river, the navigation of which is interrupted by a series of falls before Bolivian territory is reached. The Bolivian port of entry for this trade, Villa Bella, is situated above the falls of the Madeira at the confluence of the Beni and Mamoré, and is reached from the lower river by a long and costly portage. It is also shut off from the navigable rivers above by the falls of the Beni and Mamoré. The railway to be built by Brazil will remedy this unfavourable situation, will afford a better outlet for north-eastern Bolivia, and should promote a more rapid development of that region, which is covered with an admirable system of navigable rivers above the falls of the Beni and Mamoré. Connected with the upper Paraguay are Puerto Pacheco on Bahia Negra, Puerto Suarez (about 1600 m. from Buenos Aires by river), on Lake Cáceres, through which passes the bulk of Bolivian trade in that direction, and Puerto Quijarro, on Lake Gaiba, a projected port said to be more accessible than any other in this region. Whenever the trade of southern Bolivia becomes important enough to warrant the expense of opening a navigable channel in the Pilcomayo, direct river communication with Buenos Aires and Montevideo will be possible.

Industries.—Stock-raising was one of the earliest industries of the country after that of mining. Horses, formerly successfully raised in certain parts of the north, have not flourished there since the introduction of a *peste* from Brazil, but some are now raised in La Paz and other departments of the temperate region. The Jesuit founders of the Mojos missions took cattle with them when they entered that region to labour among the Indians, with the result that the Mojos and Chiquitos llanos were soon well stocked, and have since afforded an unfailing supply of beef for the neighbouring inland markets. Their inaccessibility and the costs of transportation have prevented a development of the industry and a consequent improvement in stock, but the persistency of the industry under conditions so unfavourable is evidence that the soil and climate are suited to its requirements. Farther south the llanos of Chuquisaca and Tarija also sustain large herds of cattle on the more elevated districts, and on the well-watered plains of the Chaco. There are small districts in La Paz, Potosi and Cochabamba, also, where cattle are raised. Apart from the cattle driven into the mining districts for consumption, a number of *saladeros* are employed in preparing (usually salting and sun-drying) beef for the home markets. The hides are exported. Goats are raised in the warm and temperate regions, and sheep for their wool in the latter. On the higher and colder plateaus much attention is given to the breeding of llamas and alpacas. Another industry of a different character is that of breeding the fur-bearing chinchilla (*C. laniger*), which is a native of the higher plateaus. The Bolivian government has prohibited the exportation of the live animals and is encouraging their production.

The agricultural resources of the republic are varied and of great value, but their development has been slow and hesitating. The cultivation of cereals, fruits and vegetables in the temperate and warm valleys of the Andes followed closely the mining settlements. Sugar-cane also was introduced at an early date, but as the demand for sugar was limited the product was devoted chiefly to the manufacture of rum, which is the principal object of cane cultivation in Bolivia to-day. The climatic conditions are highly favourable for this product in eastern Bolivia, but it is heavily taxed and is restricted to a small home market. Rice is another exotic grown in the tropical districts of eastern Bolivia, but the quantity produced is far from sufficient to meet local requirements. Tobacco of a fair quality is produced in the warm regions of the east, including the *yungas* valleys of La Paz and Cochabamba; cacáo of a superior grade is grown in the department of Beni, where large orchards were planted at the missions, and also in the warm Andean valleys of La Paz and Cochabamba; and coffee of the best flavour is grown in some of the warmer districts of the eastern Andes. The two indigenous products which receive most attention, perhaps, are those of quinoa and coca. Quinoa is grown in large quantities, and is a staple article of food among the natives. Coca is highly esteemed by the natives, who masticate the leaf, and is also an article of export for medicinal purposes. It is extensively cultivated in the departments of Cochabamba and La Paz, especially in the province of Yungas.

In the exploitation of her forest products, however, are to be found the industries that yield the greatest immediate profit to Bolivia. The most prominent and profitable of these is that of rubber-collecting, which was begun in Bolivia between 1880 and 1890, and which reached a registered annual output of nearly 3500 metric tons just before Bolivia's best rubber forests were transferred to Brazil in 1903. There still remain extensive areas of forest on the Beni and Madre de Dios in which the rubber-producing *Hevea* is to be found. Although representing less value in the aggregate, the collecting of cinchona bark is one of the oldest forest industries of Bolivia, which is said still to have large areas of virgin forest to draw upon. The Bolivian product is of the best because of the high percentage of quinine sulphate which it yields. The industry is destructive in method, and the area of cinchona forests is steadily diminishing. Many other Bolivian plants are commercially valuable, and organized industry and trade in them will certainly be profitable.

The industrial activities of the Bolivian people are still of a very primitive character. An act was passed in 1894 authorizing the government to offer premiums and grant advantageous concessions for the development of manufacturing industries, especially in sugar production, but conditions have not been favourable and the results have been disappointing. Spinning and weaving are carried on among the people as a household occupation, and fabrics are made of an exceptionally substantial character. It is not uncommon to see the natives busily twirling their rude spindles as they follow their troops of pack animals over rough mountain roads, and the yarn produced is woven into cloth in their own houses on rough Spanish looms of colonial patterns. Not only is coarse cloth for their own garments made in this manner from the fleece of the llama, but cotton and woollen goods of a serviceable character are manufactured, and still finer fabrics are woven from the wool of the alpaca and vicuña, sometimes mixed with silk or lamb's wool. The Indian women are expert weavers, and their handiwork often commands high prices. In the Mojos and Chiquitos districts the natives were taught by the Jesuit missionaries to weave an excellent cotton cloth, and the industry still exists. Cashmere, baize, waterproof *ponchos* of fine wool and silk, and many other fabrics are made by the Indians of the Andean departments. They are skilled in the use of dyes, and the Indian women pride themselves on a large number of finely-woven, brilliantly-coloured petticoats. Tanning and saddlery are carried on by the natives with

primitive methods, but with excellent results. They are skilful in the preparation of lap robes and rugs from the skins of the alpaca and vicuña. The home markets are supplied, by native industry, with cigars and cigarettes, soap, candles, hats, gloves, starch, cheese and pottery. Sugar is still made in the old way, and there is a small production of wine and silk in certain districts. No country is better supplied with water power, and electric lighting and electric power plants have been established at La Paz.

Commerce.—The foreign trade of Bolivia is comparatively unimportant, but the statistical returns are incomplete and unsatisfactory; the imports of 1904 aggregated only £1,734,551 in value, and the exports only £1,851,758. The imports consisted of cottons, woollens, live-stock, provisions, hardware and machinery, wines, spirits and clothing. The principal exports were (in 1903) silver and its ores (£636,743), tin and its ores (£1,039,298), copper ores (£157,609), bismuth (£16,354), other minerals (£20,948), rubber (£260,559), coca (£28,907), and cinchona (£9197)—total exports, £2,453,638. These figures, however, do not correctly represent the aggregates of Bolivian trade, as her imports and exports passing through Antofagasta, Arica and Mollendo are to a large extent credited to Chile and Peru. The import trade of Bolivia is restricted by the poverty of the people. The geographical position limits the exports to mineral, forest and some pastoral products, owing to cost of transportation and the tariffs of neighbouring countries.

Government.—The government of Bolivia is a “unitarian” or centralized republic, representative in form, but autocratic in some important particulars. The constitution in force (1908) was adopted on the 28th of October 1880, and is a model in form and profession. The executive branch of the government is presided over by a president and two vice-presidents, who are elected by direct popular vote for a period of four years, and are not eligible for re-election for the next succeeding term. The president is assisted by a cabinet of five ministers of state, viz.: foreign relations and worship; finance and industry; interior and fomento; justice and public instruction; war and colonization. Every executive act must be countersigned by a minister of state, who is held responsible for its character and enforcement, and may be prosecuted before the supreme court for its illegality and effects. The legislative branch is represented by a national congress of two houses—a Senate and Chamber of Deputies. The Senate is composed of 16 members, two from each department, who are elected by direct popular vote for a period of six years, one-third retiring every two years. The Chamber of Deputies is composed of 72 members, who are elected for a period of four years, one-half retiring every two years. In impeachment trials the Chamber prosecutes and the Senate sits as a court, as in the United States. One of the duties of the Chamber is to elect the justices of the supreme court. Congress meets annually and its sessions are for sixty days, which may be extended to ninety days. The chambers have separate and concurrent powers defined by the constitution. The right of suffrage is exercised by all male citizens, twenty-one years of age, or over, if single, and eighteen years, or over, if married, who can read and write, and own real estate or have an income of 200 bolivianos a year, said income not to be compensation for services as a servant. The electoral body is therefore small, and is under the control of a political oligarchy which practically rules the country, no matter which party is in power.

The Bolivian judiciary consists of a national supreme court, eight superior district courts, lower district courts, and *juzgados de instrucción* for the investigation and preparation of cases. The *corregidores* and *alcaldes* also exercise the functions of a justice of the peace in the cantons and rural districts. The supreme court is composed of seven justices elected by the Chamber of Deputies from lists of three names for each seat sent in by the Senate. A justice can be removed only by impeachment proceedings before the Senate.

The supreme administration in each department is vested in a prefect appointed by and responsible solely to the president. As the prefect has the appointment of subordinate department officials, including the *alcaldes*, the authority of the national executive reaches every hamlet in the republic, and may easily become autocratic. There are no legislative assemblies in the departments, and their government rests with the national executive and congress. Subordinate to the prefects are the sub-prefects in the provinces, the *corregidores* in the cantons and the *alcaldes* in the rural districts—all appointed officials. The national territory adjacent to Brazil and Peru is governed by two *delegados nacionales*, appointees of the president. The department capitals are provided with municipal councils which have jurisdiction over certain local affairs, and over the construction and maintenance of some of the highways.

Army.—The military forces of the republic in 1905 included 2890 regulars and an enrolled force of 80,000 men, divided into a first reserve of 30,000, a second reserve of 40,000, and 10,000 territorial guards. The enrolled force is, however, both unorganized and unarmed. The strength of the army is fixed in each year’s budget. That for 1903 consisted of 2933 officers and men, of which 275 were commissioned and 558 non-commissioned officers, 181 musicians, and only 1906 rank and file. A conscription law of 1894 provides for a compulsory military service between the ages of twenty-one and fifty years, with two years’ actual service in the regulars for those between twenty-one and twenty-five, but the law is practically a dead letter. There is a military school with 60 cadets, and an arsenal at La Paz.

Education.—Although Bolivia has a free and compulsory school system, education and the provision for education have made little progress. Only a small percentage of the people can read and write. Although Spanish is the language of the dominant minority, Quichua, Aymará and Guarani are the languages of the natives, who form a majority of the population. A considerable percentage of the Indians do not understand Spanish at all, and they even resist every effort to force it upon them. Even the *cholos* (mestizos) are more familiar with the native idioms than with Spanish, as is the case in some parts of Argentina and Paraguay. According to official estimates for 1901, the total number of primary schools in the republic was 733, with 938 teachers and 41,587 pupils—the total cost of their maintenance being estimated at 585,365 bolivianos, or only 14.07 bolivianos per pupil (about £1 : 4 : 6). The school enrolment was only one in 43.7 of population, compared with one in 10 for Argentina. The schools are largely under the control of the municipalities, though nearly half of them are maintained by the national government, by the Church and by private means. There were in the same year 13 institutions of secondary and 14 of superior instruction. The latter include so-called universities at Sucré (Chuquisaca), La Paz, Cochabamba, Tarija, Potosi, Santa Cruz and Oruro—all of which give instruction in law, the first three in medicine and the first four in theology. The university at Sucré, which dates from colonial times, and that at La Paz, are the only ones on the list sufficiently well equipped to merit the title. Secondary instruction is under the control of the universities, and public instruction in general is under the direction of a cabinet minister. All educational matters, however, are practically under the supervision of the Church. The total appropriation for educational purposes in 1901 was 756,943 bolivianos, or £66,232 : 6s. There are a

military academy at La Paz, an agricultural school at Umala in the department of La Paz, a mining and civil engineering school at Oruro, commercial schools at Sucré and Trinidad, and several mission schools under the direction of religious orders.

Religion.—The constitution of Bolivia, art. 2, defines the attitude of the republic toward the Church in the following words:—"The state recognizes and supports the Roman Apostolic Catholic religion, the public exercise of any other worship being prohibited, except in the colonies where it is tolerated." This toleration is tacitly extended to resident foreigners belonging to other religious sects. The census of 1900 enumerated the Roman Catholic population at 1,609,365, and that of other creeds at 24,245, which gives the former 985 and the latter 15 in every thousand. The domesticated Indians profess the Roman Catholic faith, but it is tinged with the superstitions of their ancestors. They hold the clergy in great fear and reverence, however, and are deeply influenced by the forms and ceremonies of the church, which have changed little since the first Spanish settlements. Bolivia is divided into an archbishopric and three bishoprics. The first includes the departments of Chuquisaca, Oruro, Potosi, Tarija and the Chilean province of Antofagasta, with its seat at Sucré, and is known as the archbishopric of La Plata. The sees of the three bishoprics are La Paz, Cochabamba and Santa Cruz. Mission work among the Indians is entrusted to the *Propaganda Fide*, which has five colleges and a large number of missions, and receives a small subvention from the state. It is estimated that these missions have charge of fully 20,000 Indians. The annual appropriation for the Church is about £17,150. The religious orders, which have never been suppressed in Bolivia, maintain several convents.

Finance.—No itemized returns of receipts and expenditures are ever published, and the estimates presented to congress by the cabinet ministers furnish the only source from which information can be drawn. The expenditures are not large, and taxation is not considered heavy. The estimated revenues and expenditures for 1904 and 1905 at 21 pence per boliviano, were as follows: 1904, revenue £632,773 : 15s., expenditure £748,571 : 10s.; 1905, revenue £693,763 : 17 : 6, expenditure £828,937 : 19 : 9. The revenues are derived principally from duties and fees on imports, excise taxes on spirits, wines, tobacco and sugar, general, mining taxes and export duties on minerals (except silver), export duties on rubber and coca, taxes on the profits of stock companies, fees for licences and patents, stamp taxes, and postal and telegraph revenues. Nominally, the import duties are moderate, so much so that Bolivia is sometimes called a "free-trade country," but this is a misnomer, for in addition to the schedule rates of 10 to 40% *ad valorem* on imports, there are a consular fee of 1½% for the registration of invoices exceeding 200 bolivianos, a consumption tax of 10 centavos per quintal (46 kilogrammes), fees for viséing certificates to accompany merchandise in transit, special "octroi" taxes on certain kinds of merchandise controlled by monopolies (spirits, tobacco, &c.), and the import and consumption taxes levied by the departments and municipalities. The expenditures are chiefly for official salaries, subsidies, public works, church and mission support, justice, public instruction, military expenses, and interest on the public debt. The appropriations for 1905 were as follows: war, 2,081,119 bolivianos; finance and industry, 1,462,259; government and fomento, 2,021,428; justice and public instruction, 1,878,941.

The acknowledged public debt of the country is comparatively small. At the close of the war with Chile there was an indemnity debt due to citizens of that republic of 6,550,830 bolivianos, which had been nearly liquidated in 1904 when Chile took over the unpaid balance. This was Bolivia's only foreign debt. In 1905 her internal debt, including 1,998,500 bolivianos of treasury bills, amounted to 6,243,270 bolivianos (£546,286). The government in 1903 authorized the issue of treasury notes for the department of Beni and the National Territory to the amount of one million bolivianos (£87,500), for the redemption of which 10% of the customs receipts of the two districts is set apart. The paper currency of the republic consists of bank-notes issued by four private banks, and is therefore no part of the public debt. The amount in circulation on the 30th of June 1903 was officially estimated at 9,144,254 bolivianos (£800,122), issued on a par with silver. The coinage of the country is of silver, nickel and copper. The silver coins are of the denominations of 1 boliviano, or 100 centavos, 50, 20, 10 and 5 centavos, and the issue of these coins from the Potosi mint is said to be about 1,500,000 bolivianos a year. The silver mining companies are required by law to send to the mint 20% of their product. The silver boliviano, however, is rarely seen in circulation because of the cheaper paper currency. To check the exportation of silver coin, the fractional denominations have been slightly debased. The nickel coins are of 5 and 10 centavos, and the copper 1 and 2 centavos.

The departmental revenues, which are derived from excise and land taxes, mining grants, tithes, inheritance taxes, tolls, stamp taxes, subsidies from the national treasury and other small taxes, were estimated at 2,296,172 bolivianos in 1903, and the expenditures at 2,295,791 bolivianos. The expenditures were chiefly for justice, police, public works, public instruction and the Church. The municipal revenues aggregated 2,317,670 bolivianos in 1902, and the expenditures 61,510 bolivianos in excess of that sum. These revenues are derived from a lighting tax, leases and ground rents, cemetery fees, consumption and market taxes, licences, tolls, taxes on hides and skins, personal and various minor taxes. There is a multiplication of taxes in trade which recalls the old colonial *alcabala* tax, and it serves to restrict commerce and augment the cost of goods in much the same way, if not to the same degree.

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(A. J. L.)

History

The country now forming the republic of Bolivia, named after the great liberator Simon Bolivar (*q.v.*), was in early days simply a portion of the empire of the Incas of Peru (*q.v.*). After the conquest of Peru by the Spaniards in the 16th century the natives were subjected to much tyranny and oppression, though it must in fairness be said that much of it was carried out in defiance of the efforts and the wishes of the Spanish home government, whose legislative efforts to protect the Indians from serfdom and ill-usage met with scant respect at the hands of the distant settlers and mine-owners, who bid defiance to the humane and protective regulations of the council of the Indies, and treated the unhappy natives little better than beasts of burden. The statement, moreover, that some eight millions of Indians perished through forced labour in the mines is a gross exaggeration. The annual diminution in the number of the Indian population was undoubtedly very great, but it was due far more to the result of European epidemics and to indulgence in alcohol than to hard work. The abortive insurrection of 1780-82, led by the Inca Tupac Amarú, was never a general rising, and was directed rather against Creole tyranny than against Spanish rule. The heavy losses sustained by the Indians during that outbreak, and their dislike and distrust of the colonial Spaniard, account for the comparative indifference with which they viewed the rise and progress of the 1814 colonial revolt against Spain, which gave the South American states their independence.

War of Independence.

We are only concerned here with the War of Independence so far as it affected Upper Peru, the Bolivia of later days. When the patriots of Buenos Aires had succeeded in liberating from the dominion of Spain the interior provinces of the Rio de la Plata, they turned their arms against their enemies who held Upper Peru. An almost uninterrupted warfare followed, from July 1809 till August 1825, with alternate successes on the side of the Spanish or royalist and the South American or patriot forces,—the scene of action lying chiefly between the Argentine provinces of Salta and Jujuy and the shores of Lake Titicaca. The first movement of the war was the successful invasion of Upper Peru by the army of Buenos Aires, under General Balcarce, which, after twice defeating the Spanish troops, was able to celebrate the first anniversary of independence near Lake Titicaca, in May 1811. Soon, however, the patriot army, owing to the dissolute conduct and negligence of its leaders, became disorganized, and was attacked and defeated, in June 1811, by the Spanish army under Gey fol Goyeneche, and driven back into Jujuy. Four years of warfare, in which victory was alternately with the Spaniards and the patriots, was terminated in 1815 by the total rout of the latter in a battle which took place between Potosi and Oruro. To this succeeded a revolt of the Indians of the southern provinces of Peru, and the object being the independence of the whole country, it was joined by numerous Creoles. This insurrection was, however, speedily put down by the royalists. In 1816 the Spanish general Laserna, having been appointed commander-in-chief of Upper Peru, made an attempt to invade the Argentine provinces, intending to march on Buenos Aires, but he was completely foiled in this by the activity of the irregular *gaucho* troops of Salta and Jujuy, and was forced to retire. During this time and in the six succeeding years a guerrilla warfare was maintained by the patriots of Upper Peru, who had taken refuge in the mountains, chiefly of the province of Yungas, and who frequently harassed the royalist troops. In June 1823 the expedition of General Santa Cruz, prepared with great zeal and activity at Lima, marched in two divisions upon Upper Peru, and in the following months of July and August the whole country between La Paz and Oruro was occupied by his forces; but later, the indecision and want of judgment displayed by Santa Cruz allowed a retreat to be made before a smaller royalist army, and a severe storm converted their retreat into a precipitate flight, only a remnant of the expedition again reaching Lima. In 1824, after the great battle of Ayacucho in Lower Peru, General Sucre, whose valour had contributed so much to the patriot success of that day, marched with a part of the victorious army into Upper Peru. On the news of the victory a universal rising of the patriots took place, and before Sucre had reached Oruro and Puno, in February 1825, La Paz was already in their possession, and the royalist garrisons of several towns had gone over to their side. The Spanish general Olañeta, with a diminished army of 2000 men, was confined to the province of Potosi, where he held out till March 1825, when he was mortally wounded in an action with some of his own revolted troops.

Bolivia a nation.

General Sucre was now invested with the supreme command in Upper Peru, until the requisite measures could be taken to establish in that country a regular and constitutional government. Deputies from the various provinces to the number of fifty-four were assembled at Chuquisaca, the capital, to decide upon the question proposed to them on the part of the government of the Argentine provinces, whether they would or would not remain separate from that country. In August 1825 they decided this question, declaring it to be the national will that Upper Peru should in future constitute a distinct and independent nation. This assembly continued their session, although the primary object of their meeting had thus been accomplished, and afterwards gave the name of Bolivia to the country,—issuing at the same time a formal declaration of independence.

The first general assembly of deputies of Bolivia dissolved itself on the 6th of October 1825, and a new congress was summoned and formally installed at Chuquisaca on the 25th of May 1826, to take into consideration the constitution prepared by Bolivar for the new republic. A favourable report was made to that body by a committee appointed to examine it, on which it was approved by the congress, and declared to be the constitution of the republic; and as such, it was sworn to by the people. General Sucre was chosen president for life, according to the constitution, but only accepted the appointment for the space of two years, and on the express condition that 2000 Colombian troops should be permitted to remain with him.

The independence of the country, so dearly bought, did not, however, secure for it a peaceful future. Repeated risings occurred, till in the end of 1827 General Sucre and his Colombian troops were driven from La Paz. A new congress was formed at Chuquisaca in April 1828, which modified the constitution given by Bolivar, and chose Marshal Santa Cruz for president; but only a year later a revolution, led by General Blanco, threw the country into disorder and for a time overturned the government. Quiet being again restored in 1831, Santa Cruz promulgated the code of laws which bore his name, and brought the financial affairs of the country into some order; he also concluded a treaty of commerce with Peru, and for several years Bolivia remained in peace. In 1835, when a struggle for the chief power had made two factions in the neighbouring republic of Peru, Santa Cruz was induced to take a part in the contest; he marched into that country, and after defeating General Gamarra, the leader of one of the opposing parties, completed the pacification of Peru in the spring of 1836, named himself its protector, and had in view a confederation of the two countries. At this juncture the government of Chile interfered actively, and espousing the cause of Gamarra, sent troops into Peru. Three years of fighting ensued till in a battle at Jungay in June 1839 Santa Cruz was defeated and exiled, Gamarra became president of Peru, and General Velasco provisional chief in Bolivia. The Santa Cruz party, however, remained strong in Bolivia, and soon revolted successfully against the new head of the government, ultimately installing General Ballivian in the chief power. Taking advantage of the disturbed condition of Bolivia, Gamarra made an attempt to annex the rich province of La Paz, invading it in August 1841 and besieging the capital; but in a battle with Ballivian his army was totally routed, and Gamarra himself was killed. The Bolivian general was now in turn to invade Peru, when Chile again interfered to prevent him. Ballivian remained in the presidency till 1848, when he retired to Valparaiso, and in the end of that year General Belzu, after leading a successful military revolution, took the chief power, and during his presidency endeavoured to promote agriculture, industry and trade. General Jorge Cordova succeeded him, but had not been long in office when a new revolt in September 1857, originating with the garrison of Oruro, spread over the land, and compelled him to quit the country. His place was taken by Dr José Maria Linares, the originator of the revolution, who, taking into his own hands all the powers of government, and acting with the greatest severity, caused himself to be proclaimed dictator in March 1858. Fresh disturbances led to the deposition of Linares in 1861, when Dr Maria de Acha was chosen president. In 1862 a treaty of peace and commerce with the United States was ratified, and in the following year a similar treaty was concluded with Belgium; but new causes of disagreement with Chile had arisen in the discovery of rich beds of guano on the eastern coast-land of the desert of Atacama, which threatened warfare, and were only set at rest by the treaty of August 1866, in which the 24th parallel of latitude was adopted as the boundary between the two republics. A new military revolution, led by Maria Melgarejo, broke out in 1865, and in February of that year the troops of President Acha were defeated in a battle near Potosi, when Melgarejo took the dominion of the country. After defeating two revolutions, in 1865 and 1866, the new president declared a political amnesty, and in 1869, after imposing a revised constitution on the country, he became its dictator.

In January 1871 President Melgarejo was in his turn deposed and driven from the country by a revolution headed by Colonel Augustin Morales. The latter, becoming president, was himself murdered in November 1872 and was succeeded by Colonel Adolfo Ballivian, who died in 1874. Under this president Bolivia entered upon a secret agreement with Peru which was destined to have grave consequences for both countries. To understand the reasons that urged Bolivia to take this step it is necessary to go back to the above-mentioned treaty of 1866 between Chile and Bolivia. By this instrument Bolivia, besides conceding the 24th parallel as the boundary of Chilean territory, agreed that Chile should have a half share of the customs and full facilities for trading on the coast that lay between the 23rd and 24th parallels, Chile at that time being largely interested in the trade of that region. It was also agreed that Chile should be allowed to mine and export the products of this district without tax or hindrance on the part of Bolivia. In 1870, in further consideration of the sum of $10,000, Bolivia granted to an Anglo-Chilean company the right of working certain nitrate deposits north of the 24th parallel. The great wealth which was passing into Chilean hands owing to these compacts created no little discontent in Bolivia, nor was Peru any better pleased with the hold that Chilean capital was establishing in the rich district of Tarapacá. On 6th February 1873 Bolivia entered upon a secret agreement with Peru, the ostensible object of which was the preservation of their territorial integrity and their mutual defence against exterior aggression. There can be no doubt that the aggression contemplated as possible by both countries was a further encroachment on the part of Chile.

Recent history.

Upon the death of Adolfo Ballivian, immediately after the conclusion of this treaty with Peru, Dr Tomas Frias succeeded to the presidency. He signed yet another treaty with Chile, by which the latter agreed to withdraw her claim to half the duties levied in Bolivian ports on condition that all Chilean industries established in Bolivian territory should be free from duty for twenty-five years. This treaty was never ratified, and four years later General Hilarion Daza, who had succeeded Dr Frias as president in 1876, demanded as the price of Bolivia’s consent that a tax of 10 cents per quintal should be paid on all nitrates exported from the country, further declaring that, unless this levy was paid, nitrates in the hands of the exporters would be seized by the Bolivian government. As an answer to these demands, and in order to protect the property of Chilean subjects, the Chilean fleet was sent to blockade the ports of Antofagasta, Cobija and Tocapilla. On the 14th February 1879 the Chilean colonel Sotomayor occupied Antofagasta, and on 1st March, a fortnight later, the Bolivian government declared war.

An offer on the part of Peru to act as mediator met with no favour from Chile. The existence of the secret treaty, well known to the Chilean government, rendered the intervention of Peru more than questionable, and the law passed by the latter in 1875, which practically created a monopoly of the Tarapacá nitrate beds to the serious prejudice of Chilean enterprise, offered no guarantee of her good faith. Chile replied by curtly demanding the annulment of the secret treaty and an assurance of Peruvian neutrality. Both demands being refused, she declared war upon Peru.

The superiority of the Chileans at sea, though checked for some time by the heroic gallantry of the Peruvians, soon enabled them to land a sufficient number of troops to meet the allied forces which had concentrated at Arica and other points in the south. The Bolivian ports were already in Chilean hands, and a sea attack upon Pisagua surprised and routed the troops under the Peruvian general Buendia and opened the way into the southern territory of Peru. General Daza, who should have cooperated with Buendia, turned back, on receiving news of the Peruvian defeat, and led the Bolivian troops to Tacna in a hasty and somewhat disorderly retreat. The fall of San Francisco followed, and Iquique, which was evacuated by the allies without a struggle, was

occupied. Severe fighting took place before Tarapacá surrendered, but the end of 1879 saw the Chileans in complete possession of the province.

Meanwhile a double revolution took place in Peru and Bolivia. In the former country General Prado was deposed and Colonel Pierola proclaimed dictator. The Bolivians followed the example of their allies. The troops at Tacna, indignant at the inglorious part they had been condemned to play by the incompetence or cowardice of their president, deprived him of their command and elected Colonel Camacho to lead them. At the same time a revolution in La Paz proclaimed General Narciso Campero president, and he was elected to that post in the following June by the ordinary procedure of the constitution. During 1880 the war was chiefly maintained at sea between Chile and Peru, Bolivia taking little or no part in the struggle. In January of 1881 were fought the battles of Chorillos and Miraflores, attended by heavy slaughter and savage excesses on the part of the Chilean troops. They were followed almost immediately by the surrender of Lima and Callao, which left the Chileans practically masters of Peru. In the interior, however, where the Peruvian admiral Montero had formed a provisional government, the war still lingered, and in September 1882 a conference took place between the latter and President Campero, at which it was decided that they should hold out for better terms. But the Peruvians wearied of the useless struggle. On the 20th of October 1883 they concluded a treaty of peace with Chile; the troops at Arequipa, under Admiral Montero, surrendered that town, and Montero himself, coldly received in Bolivia, whither he had fled for refuge, withdrew from the country to Europe. On the 9th of November the Chilean army of occupation was concentrated at Arequipa, while what remained of the Bolivian army lay at Oruro. Negotiations were opened, and on 11th December a peace was signed between Chile and Bolivia. By this treaty Bolivia ceded to Chile the whole of its sea-coast, including the port of Cobija.

On the 18th of May 1895 a treaty was signed at Santiago between Chile and Bolivia, “with a view to strengthening the bonds of friendship which unite the two countries,” and, “in accord with the higher necessity that the future development and commercial prosperity of Bolivia require her free access to the sea.” By this treaty Chile declared that if, in consequence of the plebiscite (to take place under the treaty of Ancon with Peru), or by virtue of direct arrangement, she should “acquire dominion and permanent sovereignty over the territories of Tacna and Arica, she undertakes to transfer them to Bolivia in the same form and to the same extent as she may acquire them”; the republic of Bolivia paying as an indemnity for that transfer $5,000,000 silver. If this cession should be effected, Chile should advance her own frontier north of Camerones to Vitor, from the sea up to the frontier which actually separates that district from Bolivia. Chile also pledged herself to use her utmost endeavour, either separately or jointly with Bolivia, to obtain possession of Tacna and Arica. If she failed, she bound herself to cede to Bolivia the roadstead (*caleta*) of Vitor, or another analogous one, and $5,000,000 silver. Supplementary protocols to this treaty stipulated that the port to be ceded must “fully satisfy the present and future requirements” of the commerce of Bolivia.

On the 23rd of May 1895 further treaties of peace and commerce were signed with Chile, but the provisions with regard to the cession of a seaport to Bolivia still remained unfulfilled. During those ten years of recovery on the part of Bolivia from the effects of the war, the presidency was held by Dr Pacheco, who succeeded Campero, and held office for the full term; by Dr Aniceto Arce, who held it until 1892, and by Dr Mariano Baptista, his successor. In 1896 Dr Severe Alonso became president, and during his tenure of office diplomatic relations were resumed with Great Britain, Señor Aramayo being sent to London as minister plenipotentiary in July 1897. As an outcome of his mission an extradition treaty was concluded with Great Britain in March 1898.

In December an attempt was made to pass a law creating Sucre the perpetual capital of the republic. Until this Sucre had taken its turn with La Paz, Cochabamba and Oruro. La Paz rose in open revolt. On the 17th of January of the following year a battle was fought some 40 m. from La Paz between the insurgents and the government forces, in which the latter were defeated with the loss of a colonel and forty-three men. Colonel Pando, the insurgent leader, having gained a strong following, marched upon Oruro, and entered that town on 11th April 1899, after completely defeating the government troops. Dr Severo Alonso took refuge in Chilean territory; and Colonel Pando formed a provisional government. He had no difficulty in obtaining his election to the presidency without opposition. He entered upon office on the 26th of October, and proved himself to be a strong and capable chief magistrate. He had to deal with two difficult settlements as to boundaries with Chile and Brazil, and to take steps for improving the means of communication in the country, by this means reviving its mining and other industries. The dispute with Brazil over the rich Acré rubber-producing territory was accentuated by the majority of those engaged in the rubber industry being Brazilians, who resented the attempts of Bolivian officials to exercise authority in the district. This led to a declaration of independence on the part of the state of Acré, and the despatch of a body of Bolivian troops in 1900 to restore order. There was no desire, however, on the part of President Pando to involve himself in hostilities with Brazil, and in a spirit of concession the dispute was settled amicably by diplomatic means, and a treaty signed in November 1903. A new boundary line was drawn, and a portion of the Acré province ceded to Brazil in consideration of a cash indemnity of $10,000,000.

The long-standing dispute with Chile with regard to its occupation of the former Bolivian provinces of Tacna and Arica under the Parto de Tregna of the 4th of April 1884 was more difficult to arrange satisfactorily. In 1895 there had been some prospect of Chile conceding an outlet on the sea in exchange for a recognition of the Chilean ownership of Tacna and Arica. The discovery, however, of secret negotiations between Bolivia and Argentina caused Chile to change its conciliatory attitude. Bolivia was in no position to venture upon hostilities or to compel the Chileans to make concessions, and the final settlement of the boundary dispute between Argentina and Chile deprived the Bolivians of the hope of obtaining the support of the Argentines. President Pando and his successor, Ismail Montes, who became president in 1904, saw that it was necessary to yield, and to make the best terms they could. A treaty was accordingly ratified in 1905, which was in many ways advantageous to Bolivia, though the republic was compelled to cede to Chile the maritime provinces occupied by the latter power since the war of 1881, and to do without a seaport. The government of Chile undertook to construct a railway at its own cost from Arica to the Bolivian capital, La Paz, and to give the Bolivians free transit through Chilean territory to certain towns on the coast. Chile further agreed to pay Bolivia a cash indemnity and lend certain pecuniary assistance to the construction of other railways necessary for the opening out of the country.

See C. Wiener, *Bolivie et Pérou* (Paris, 1880); E. Mossbach, *Bolivia* (Leipzig, 1875); Theodore Child, *The South American Republics* (New York, 1801); Vicente de Ballivian y Rizas, *Archive Boliviano. Collecion de documentes*

relativos a la historia de Bolivia (Paris, 1872); Ramon Sotomayor Valdes, *Estudio historico de Bolivia bajo la administracion del General don José Maria Achá con una introducion que contiene el compendio de la Guerra de la independencia i de los gobiernos de dicha Republica hasta 1861* (Santiago de Chile, 1874).

(W. Hd.; G. E.)

BOLKHOV, a town of Russia, in the government of Orel, and 35 m. N. of the city of Orel. Pop. (1897) 20,703. It is prettily situated amongst orchards and possesses a cathedral. There is a lively trade in hemp, hemp-seed oil, hemp goods and cattle, and there are hemp-mills, soap-works and tanneries. The much-venerated monastery, Optina Pustyn, is close by.

BOLL, a botanical term for a fruit-pod, particularly of the cotton plant. The word is in O. Eng. *bolla*, which is also represented in "bowl," a round vessel for liquids, a variant due to "bowl," ball, which is from the Fr. *boule*. "Boll" is also used, chiefly in Scotland and the north of England, as a measure of weight for flour = 140 lb, and of capacity for grain: 16 pecks = 1 boll.

BOLLANDISTS, the Belgian Jesuits who publish the *Acta Sanctorum*, the great collection of biographies and legends of the saints, arranged by days, in the order of the calendar. The original idea was conceived by a Jesuit father, Heribert Rosweyde (see Hagiology), and was explained by him in a sort of prospectus, which he issued in 1607 under the title of *Fasti sanctorum quorum vitae in Belgicis Bibliothecis manuscriptae*. His intention was to publish in eighteen volumes the lives of the saints compiled from the MSS., at the same time adding sober notes. At the time of his death (1629) he had collected a large amount of material, but had not been able actually to begin the work. A Jesuit father, John Bolland, was appointed to carry on the project, and was sent to Antwerp. He continued to amass material, and extended the scope of the work. In 1643 the two volumes for January appeared. The three volumes for February appeared in 1658, the three for March in 1668, the three for April in 1675, and so on. In 1635 Henschenius (Godfried Henschen) was associated with Bolland, and collaborated in the work until 1681. From 1659 to 1714 Papebroch (Daniel van Papenbroeck) collaborated. This was the most brilliant period in the history of the *Acta Sanctorum*. The freedom of Papebroch's criticism made him many enemies, and he had often to defend himself against their attacks. The work was continued—with some inequalities, but always in the same spirit—until the suppression of the Society of Jesus in 1773. The last volume published was vol. iii. of October, which appeared in 1770.

On the dispersion of the Jesuits the Bollandists were authorized to continue their work, and remained at Antwerp until 1778, when they were transferred to Brussels, to the monastery of canons regular of Coudenberg. Here they published vol. iv. of October in 1780, and vol. v. of October in 1786, when the monastery of Coudenberg was suppressed. In 1788 the work of the Bollandists ceased. The remains of their library were acquired by the Premonstratensians of Tongerloo, who endeavoured to continue the work, and in their abbey vol. vi. of October appeared in 1794.

After the re-establishment of the Society of Jesus in Belgium the work was again taken up in 1837, at the suggestion of the Académie Royale of Belgium and with the support of the Belgian government, and the Bollandists were installed at the college of St Michael in Brussels. In 1845 appeared vol. vii. of October, the first of the new series, which reached vol. xiii. of October in 1883. In this series the Jesuit fathers Joseph van der Moere, Joseph van Hecke, Benjamin Bossue, Victor and Remi de Buck, Ant. Tinnebroeck, Edu. Carpentier and Henr. Matagne collaborated. Father John Martinov of Theazan was entrusted with the editing of the *Annus Graeco-Slavicus*, which appeared in the beginning of vol. xi. of October in 1864.

In 1882 the activities of the Bollandists were exerted in a new direction, with a view to bringing the work more into line with the progress of historical methods. A quarterly review was established under the title of *Analecta Bollandiana* by the Jesuit fathers C. de Smedt, G. van Hooff and J. de Backer. This reached its 25th volume in 1906, and was edited by the Bollandists de Smedt, F. van Ontroy, H. Delehaye, A. Porcelet and P. Peeters. This review contains studies in preparation for the continuation and remoulding of the *Acta Sanctorum*, inedited texts, dissertations, and, since 1892, a *Bulletin des publications hagiographiques*, containing criticisms of recent works on hagiographic questions. In addition to this review, the Bollandists undertook the analysis of the hagiographic MSS. in the principal libraries. Besides numerous library catalogues published in the *Analecta* (*e.g.* those of Chartres, Namur, Ghent, Messina, Venice, etc.), separate volumes were devoted to the Latin MSS. in the Bibliothèque Royale at Brussels (2 vols., 1886-1889), to the Latin and Greek MSS. in the Bibliothèque Nationale at Paris (5 vols., 1889-1896), to the Greek MSS. in the Vatican (1899), and to the Latin MSS. in the libraries of Rome (1905 seq.). They also prepared inventories of the hagiographic texts hitherto published, and of these there have appeared the *Bibliotheca hagiographica graeca* (1895), the *Bibliotheca hagiographica latina* (1899) and the *Bibliotheca hagiographica Orientalis*. These indispensable works delayed the publication of the principal collection, but tended to give it a more solid basis and a strictly scientific stamp. In 1887 appeared vol. i. for November; in 1894, vol. ii., preceded by the *Martyrologium Hieronymianum* by J.B. de Rossi and the abbé Louis Duchesne; in 1902, the *Propylaeum ad Acta Sanctorum Novembris*, comprising the *Synaxarium ecclesiae Constantinopolitanae*.

There are three editions of the *Acta Sanctorum*: the original edition (Antwerp, Tongerloo and Brussels, 63 vols., 1643-1902); the Venice edition, stopping at vol. v. of September (1734-1770); and the Paris edition, stopping at vol. xiii. of October (61 vols., 1863-1883). In addition to these, there is a volume of tables, edited by the abbé Rigollot.

See *Acta Sanctorum apologelicis libris ... vindicata* (Antwerp, 1755); L.P. Gachard, *Mémoire historique sur les Bollandistes* (Brussels, 1835); van Hecke, "De ratione operis Bollandiani" (*Acta Sanctorum Octobris*, vii.); and Cardinal J.B. Pitra, *Études sur la collection des Actes des Saints* (Paris, 1880).

(H. De.)

BOLOGNA, GIOVANNI DA (1524-1608) [Ital. for his real name, Jean Bologne or Boullongne], French sculptor, was born at Douai in 1524. His early training as a sculptor was conducted at Antwerp, but at the age of twenty-five he went to Italy and he settled in 1553 in Florence, where his best works still remain. His two most celebrated productions are the single bronze figure of Mercury, poised on one foot, resting on the head of a zephyr, as if in the act of springing into the air (in the Bargello gallery), and the marble group known as the Rape of the Sabines, which was executed for Francesco de' Medici and received this name, Lanzi informs us, after it was finished. It is now in the Loggia de Lanzi of the ducal piazza. Giovanni was also employed at Genoa, where he executed various excellent works, chiefly in bronze. Most of his pieces are characterized by great spirit and elegance. His great fountain at Bologna (1563-1567) is remarkable for beauty of proportion. Noteworthy also are his two fountains in the Boboli gardens, one completed in 1576 and the other in 1585. He also cast the fine bronze equestrian statue of Cosimo de' Medici at Florence and the very richly decorated west door of Pisa cathedral. One of Bologna's best works, a group of two nude figures fighting, is now lost. A fine copy in lead was at one time in the front quadrangle of Brasenose College, Oxford. In 1881 it was sold for old lead by the principal and fellows of the college, and was melted down by the plumber who bought it.

See *La Vie et l'œuvre de Jean Bologne, par Abel Desjardins, d'après les manuscrits—recueillis par Foucques de Vagnonville* (1883, numerous illustrations; list of works).

BOLOGNA, a city and archiepiscopal see of Emilia, Italy, the capital of the province of Bologna, and headquarters of the VI. army corps. It is situated at the edge of the plain of Emilia, 180 ft. above sea-level at the base of the Apennines, 82 m. due N. of Florence by rail, 63 m. by road and 50 m. direct, and 134 m. S.E. of Milan by rail. Pop. (1901) town, 102,122; commune, 153,501. The more or less rectangular Roman city, orientated on the points of the compass, with its streets arranged at right angles, can be easily distinguished from the outer city, which received its fortifications in 1206 (see G. Gozzadini, *Studi archeologico-topografici sulla citta di Bologna*, Bologna, 1868). The streets leading to the gates of the latter radiate from the outskirts, and not from the centre, of the former. Some of the oldest churches, however, lie outside the limits of the Roman city (of which no buildings remain above ground) such as S. Stefano, S. Giovanni in Monte and SS. Vitale ed Agricola. The first consists of a group of no less than seven different buildings, of different dates; the earliest of which, the former cathedral of SS. Pietro e Paolo, was constructed about the middle of the 4th century, in part with the débris of Roman buildings; while S. Sepolcro, a circular church with ornamentation in brick and an imitation of *opus reticulatum*, should probably be attributed to the 6th or 7th centuries. The present cathedral (S. Pietro), erected in 910, is now almost entirely in the baroque style. The largest church in the town, however, is that of S. Petronio, the patron saint of Bologna, which was begun in 1390; only the nave and aisles as far as the transepts were, however, completed, but even this is a fine fragment, in the Gothic style, measuring 384 ft. long, and 157 wide, whereas the projected length of the whole (a cruciform basilica) was over 700 ft., with a breadth across the transepts of 460 ft., and a dome 500 ft. high over the crossing (see F. Cavazza in *Rassegna d' Arte*, 1905, 161). The church of S. Domenico, which contains the body of the saint, who died here in 1221, is unfinished externally, while the interior was remodelled in the 18th century. There are many other churches of interest, among them S. Francesco, perhaps the finest medieval building in Bologna, begun in 1246 and finished in 1260; it has a fine brick campanile of the end of the 14th century. It was restored to sacred uses in 1887, and has been carefully liberated from later alterations (U. Berti in *Rassegna d' Arte*, 1901, 55). The church of Corpus Dominii has fine 15th-century terra cottas on the façade (F. Malaguzzi Valeri in *Archivio Storico dell' Arte*, ser. ii. vol. ii. (Rome, 1896), 72). The centre of the town is formed by the Piazza Vittorio Emanuele (formerly Piazza Maggiore), and the Piazza del Nettuno, which lie at right angles to one another. Here are the church of S. Petronio, the massive Palazzo Comunale, dating from 1245, the Palazzo del Podesta, completed in the same year, and the fine bronze statue of Neptune by Giovanni da Bologna (Jean Bologne of Douai).

The famous university of Bologna was founded in the 11th century (its foundation by Theodosius the Great in A.D. 425 is legendary), and acquired a European reputation as a school of jurisprudence under Pepo, the first known teacher at Bologna of Roman law (about 1076), and his successor Irnerius and their followers the glossators. The students numbered between three and five thousand in the 12th to the 15th century, and in 1262, it is said, nearly ten thousand (among them were both Dante and Petrarch). Anatomy was taught here in the 14th century. But despite its fame, the university, though an autonomous corporation, does not seem to have had any fixed residence: the professors lectured in their own houses, or later in rooms hired or lent by the civic authorities. It was only in 1520 that the professors of law were given apartments in a building belonging to the church of S. Petronio; and in 1562, by order of Pius IV., the university itself was constructed close by, by Carlo Borromeo, then cardinal legate. The reason of this measure was no doubt partly disciplinary, Bologna itself having in 1506 passed under the dominion of the papacy. Shortly after this, in 1564, Tasso was a student there, and was tried for writing a satirical poem. One of the most famous professors was Marcello Malpighi, a

great anatomist of the 17th century. The building has served as the communal library since 1838. Its courtyard contains the arms of those students who were elected as representatives of their respective nations or faculties. The university has since 1803 been established in the (16th century) Palazzo Poggi. Between 1815 and 1848 the number of students sank to about a hundred in some years, chiefly owing to the political persecutions of the government: in 1859 the number had risen to 355. It now possesses four faculties and is attended by some 1700 students. Among its professors women have more than once been numbered.

The Museo Civico is one of the most important museums in Italy, containing especially fine collections of antiquities from Bologna and its neighbourhood. The picture gallery is equally important in its way, affording a survey both of the earlier Bolognese paintings and of the works of the Bolognese eclectics of the 16th and 17th centuries, the Caracci, Guido Reni, Domenichino, Guercino, &c. The primitive masters are not of great excellence, but the works of the masters of the 15th century, especially those of Francesco Francia (1450-1517) and Lorenzo Costa of Ferrara (1460-1535), are of considerable merit. The great treasure of the collection is, however, Raphael's S. Cecilia, painted for the church of S. Giovanni in Monte, about 1515.

The two leaning towers, the Torre Asinelli and the Torre Garisenda, dating from 1109 and 1110 respectively, are among the most remarkable structures in Bologna: they are square brick towers, the former being 320 ft. in height and 4 ft. out of the perpendicular, the latter (unfinished) 163 ft. high and 10 ft. out of the perpendicular. The town contains many fine private palaces, dating from the 13th century onwards. The streets are as a rule arcaded, and this characteristic has been preserved in modern additions, which have on the whole been made with considerable taste, as have also the numerous restorations of medieval buildings. A fine view may be had from the Madonna di S. Luca, on the south-west of the town (938 ft.).

Among the specialities of Bologna may be noted the *salami* or *mortadella* (Bologna sausage), *tortellini* (a kind of macaroni) and liqueurs.

Bologna is an important railway centre, just as the ancient Bononia was a meeting-point of important roads. Here the main line from Milan divides, one portion going on parallel to the line of the ancient Via Aemilia (which it has followed from Piacenza downwards) to Rimini, Ancona and Brindisi, and the other through the Apennines to Florence and thence to Rome. Another line runs to Ferrara and Padua, another (eventually to be prolonged to Verona) to S. Felice sul Panaro, and a third to Budrio and Portomaggiore (a station on the line from Ferrara to Ravenna). Steam tramways run to Vignola, Pieve di Cento and Malalbergo.

Bologna was only for a short while subject to the Lombards, remaining generally under the rule of the exarchate of Ravenna, until this in 756 was given by Pippin to the papacy. It was sacked by the Hungarians in 902, but otherwise its history is little known, and it is uncertain when it acquired its freedom and its motto *Libertas*. But the first "constitution" of the commune of Bologna dates from about 1123, and at that time we find it a free and independent city. From the 12th to the 14th century it was very frequently at war, and strongly supported the Guelph cause against Frederick II. and against the neighbouring cities of Romagna and Emilia; indeed, in 1249 the Bolognese took Enzio, the emperor's son, prisoner, and kept him in confinement for the rest of his life. But the struggles between Guelphs and Ghibellines in Bologna itself soon followed, and the commune was so weakened that in 1337 Taddeo de' Pepoli made himself master of the town, and in 1350 his son sold it to Giovanni Visconti of Milan. Ten years later it was given to the papacy, but soon revolted and recovered its liberty. In 1401 Giovanni Bentivoglio made himself lord of Bologna, but was killed in a rebellion of 1402. It then returned to the Visconti, and after various struggles with the papacy was again secured in 1438 by the Bentivoglio, who held it till 1506, when Pope Julius II. drove them out, and brought Bologna once more under the papacy, under the sway of which it remained (except in the Napoleonic period between 1796 and 1815 and during the revolutions of 1821 and 1831) until in 1860 it became part of the kingdom of Italy.

Among the most illustrious natives of Bologna may be noted Luigi Galvani (1737-1798), the discoverer of galvanism, and Prospero Lambertini (Pope Benedict XIV.).

See C. Ricci, *Guida di Bologna* (3rd ed., Bologna, 1900).

(T. As.)

BOLSENA (anc. *Volsinii*),[1] a town of the province of Rome, Italy, 12 m. W.S.W. of Orvieto by road, situated on the north-east bank of the lake of Bolsena. Pop. (1901) 3286. The town is dominated by a picturesque medieval castle, and contains the church of S. Christina (martyred by drowning in the lake, according to the legend, in 278) which dates from the 11th century and contains some frescoes, perhaps of the school of Giotto. It has a fine Renaissance façade, constructed about 1500 by Cardinal Giovanni de' Medici (afterwards Pope Leo X.), and some good terra cottas by the Della Robbia. Beneath the church are catacombs, with the tomb of the saint, discovered in 1880 (E. Stevenson in *Notizie degli Scavi*, 1880, 262; G.B. de Rossi in *Bullettino d'Archeologia Cristiana*, 1880, 109). At one of the altars in this crypt occurred the miracle of Bolsena in 1263. A Bohemian priest, sceptical of the doctrine of transubstantiation, was convinced of its truth by the appearance of drops of blood on the host he was consecrating. In commemoration of this Pope Urban IV. instituted the festival of Corpus Christi, and ordered the erection of the cathedral of Orvieto. The miracle forms the subject of a celebrated fresco by Raphael in the Vatican.

The Lake of Bolsena (anc. *Lacus Volsiniensis*), 1000 ft. above sea-level, 71 sq. m. in area, and 480 ft. deep, is almost circular, and was the central point of a large volcanic district, though it is probably not itself an extinct crater. Its sides show fine basaltic formation in places. It abounds in fish, but its banks are somewhat deserted and not free from malaria. It contains two islands, Bisentina and Martana, the former containing a church constructed by Vignola, the latter remains of the castle where Amalasuntha, the daughter of Theodoric, was imprisoned and strangled.

(T. As.)

1 According to the theory now generally adopted, the Etruscan Volsinii occupied the site of Orvieto, which was hence

called *Urbs vetus* in late classical and medieval times, while the Roman Volsinii was transferred to Bolaena (see VOLSINII).

BOLSOVER, an urban district in the north-eastern parliamentary division of Derbyshire, England, 5½ m. E. of Chesterfield, on branch lines of the Midland and the Great Central railways. Pop. (1901) 6844. It lies at a considerable height on a sharp slope above a stream tributary to the river Rother. The castle round which the town grew up was founded shortly after the Conquest by William Peveril, but the existing building, a fine castellated residence, was erected on its site in 1613. The town itself was fortified, and traces of early works remain. The church of St Mary is of Norman and later date; it contains some interesting early stone-carving, and monuments to the family of Cavendish, who acquired the castle in the 16th century. Coal-mining and quarrying are carried on in the neighbourhood of Bolsover.

BOLSWARD, a town in the province of Friesland, Holland, 6½ m. W.N.W. of Sneek. A steam-tramway connects it with Sneek, Makkum, Harlingen and Franeker. Pop. (1900) 6517. The Great church, or St Martin's (1446-1466) is a large building containing some good carving, a fine organ and the tombs of many Frisian nobles. The so-called Small church, dating from about 1280, also contains fine carving and tombstones; and is the remnant of a Franciscan convent which once existed here. Bolsward also possesses a beautiful renaissance town-hall (1614-1618) and various educational and charitable institutions, including a music and a drawing school. It has an active trade in agricultural produce, and some spinning-mills and tile and pottery works. The town is mentioned in 725, when it was situated on the Middle Sea. When this receded, a canal was cut to the Zuider Zee, and in 1422 it was made a Hansa town.

The medieval constitution of Bolsward, though in its government by eight *scabini*, with judicial, and four councillors with administrative functions, it followed the ordinary type of Dutch cities, was in some ways peculiar. The family of Jongema had certain hereditary rights in the administration, which, though not mentioned in the town charter of 1455, were defined in that of 1464. According to this the head of the family sat for two years with the *scabini* and the third year with the councillors, and had the right to administer an oath to one of each body. More singular was the influential position assigned, in civic legislation and administration, to the clergy, to whom in conjunction with the councillors, there was even, in certain cases, an appeal from the judgment of the *scabini*.

See C. Hegel, *Stadte u. Gilden der germanischen Völker im Mittelalter* (Leipzig, 1891).

BOLT, an O. Eng. word (compare Ger. *Bolz*, an arrow), for a "quarrel" or cross-bow shaft, or the pin which fastened a door. From the swift flight of an arrow comes the verb "to bolt," as applied to a horse, &c., and such expressions as "bolt upright," meaning straight upright; also the American use of "bolt" for refusing to support a candidate nominated by one's own party. In the sense of a straight pin for a fastening, the word has come to mean various sorts of appliances. From the sense of "fastening together" is derived the use of the word "bolt" as a definite length (in a roll) of a fabric (40 ft. of canvas, &c.).

From another "bolt" or "boult," to sift (through O. Fr. *buleter*, from the Med. Lat. *buretare* or *buletare*), come such expressions as in Shakespeare's *Winter's Tale*, "The fann'd snow, That's bolted by the northern blasts twice o'er," or such a figurative use as in Burke's "The report of the committee was examined and sifted and bolted to the bran." From this sense comes that of to moot, or discuss, as in Milton's *Comus*, "I hate when vice can bolt her arguments."

BOLTON, DUKES OF. The title of duke of Bolton was held in the family of Powlett or Paulet from 1689 to 1794. Charles Powlett, the 1st duke (*c.* 1625-1699), who became 6th marquess of Winchester on his father's death in 1675, had been member of parliament for Winchester and then for Hampshire from 1660 to 1675. Having supported the claim of William and Mary to the English throne in 1688, he was restored to the privy council and to the office of lord-lieutenant of Hampshire, and was created duke of Bolton in April 1689. An eccentric man, hostile to Halifax and afterwards to Marlborough, he is said to have travelled during 1687 with four coaches and 100 horsemen, sleeping during the day and giving entertainments at night. He died in February 1699, and was succeeded by his elder son, Charles, 2nd duke of Bolton (1661-1722), who had also been a member of parliament for Hampshire and a supporter of William of Orange. He was lord-lieutenant of Hampshire and of Dorset, a commissioner to arrange the union of England and Scotland; and was twice a lord justice of the kingdom. He was also lord chamberlain of the royal household; governor of the Isle of Wight; and for two short periods was lord-lieutenant of Ireland. His third wife was Henrietta (d. 1730), a natural daughter of James, duke of Monmouth. According to Swift this duke was "a great booby." His eldest son, Charles, 3rd

duke of Bolton (1685-1754), was a member of parliament from 1705 to 1717, when he was made a peer as Baron Pawlet of Basing. He filled many of the public offices which had been held by his father, and also attained high rank in the British army. Having displeased Sir Robert Walpole he was deprived of several of his offices in 1733; but some of them were afterwards restored to him, and he raised a regiment for service against the Jacobites in 1745. He was a famous gallant, and married for his second wife the singer, Lavinia Fenton (d. 1760), a lady who had previously been his mistress. He died in August 1754, and was succeeded as 4th duke by his brother Harry (*c.* 1690-1759), who had been a member of parliament for forty years, and who followed the late duke as lord-lieutenant of Hampshire. The 4th duke's son, Charles (*c.* 1718-1765), who became 5th duke in October 1759, committed suicide in London in July 1765, and was succeeded by his brother Harry (*c.* 1719-1794), an admiral in the navy, on whose death without sons, in December 1794, the dukedom became extinct. The other family titles descended to a kinsman, George Paulet (1722-1800), who thus became 12th marquess of Winchester. In 1778 Thomas Orde (1746-1807) married Jean Mary (d. 1814), a natural daughter of the 5th duke of Bolton, and this lady inherited Bolton Castle and other properties on the death of the 6th duke. Having taken the additional name of Powlett, Orde was created Baron Bolton in 1797, and the barony has descended to his heirs.

BOLTON (or Boulton), **EDMUND** (1575?-1633?), English historian and poet, was born by his own account in 1575. He was brought up a Roman Catholic, and was educated at Trinity Hall, Cambridge, afterwards residing in London at the Inner Temple. In 1600 he contributed to *England's Helicon*. He was a retainer of the duke of Buckingham, and through his influence he secured a small place at the court of James I. Bolton formulated a scheme for the establishment of an English academy, but the project fell through after the death of the king, who had regarded it favourably. He wrote a *Life of King Henry II.* for Speed's *Chronicle*, but his Catholic sympathies betrayed themselves in his treatment of Thomas Becket, and a life by Dr John Barcham was substituted (Wood, *Ath. Oxon.* ed. Bliss, iii. 36). The most important of his numerous works are *Hypercritica* (1618?), a short critical treatise valuable for its notices of contemporary authors, reprinted in Joseph Haslewood's *Ancient Critical Essays* (vol. ii., 1815); *Nero Caesar, or Monarchic Depraved* (1624), with special note of British affairs. Bolton was still living in 1633, but the date of his death is unknown.

BOLTON (Bolton-le-Moors), a municipal, county and parliamentary borough of Lancashire, England, 196 m. N.W. by N. from London and 11 m. N.W. from Manchester. Pop. (1891) 146,487; (1901) 168,215. Area, 15,279 acres. It has stations on the London & North-Western and the Lancashire & Yorkshire railways, with running powers for the Midland railway. It is divided by the Croal, a small tributary of the Irwell, into Great and Little Bolton, and as the full name implies, is surrounded by high moorland. Although of early origin, its appearance, like that of other great manufacturing towns of the vicinity, is wholly modern. It owes not a little to the attractions of its site. The only remnants of antiquity are two houses of the 16th century in Little Bolton, of which one is a specially good example of Tudor work. The site of the church of St Peter has long been occupied by a parish church (there was one in the 12th century, if not earlier), but the existing building dates only from 1870. There may also be mentioned a large number of other places of worship, a town hall with fine classical façade and tower, market hall, museums of natural history and of art and industry, an exchange, assembly rooms, and various benevolent institutions. Several free libraries are maintained. Lever's grammar school, 181
founded in 1641, had Robert Ainsworth, the Latin lexicographer, and John Lemprière, author of the classical dictionary, among its masters. There are municipal technical schools. A large public park, opened in 1866, was laid out as a relief work for unemployed operatives during the cotton famine of the earlier part of the decade. On the moors to the north-west, and including Rivington Pike (1192 ft.), is another public park, and there are various smaller pleasure grounds. A large number of cotton mills furnish the chief source of industry; printing, dyeing and bleaching of cotton and calico, spinning and weaving machine making, iron and steel works, and collieries in the neighbourhood, are also important. The speciality, however, is fine spinning, a process assisted by the damp climate. The parliamentary borough, created in 1832 and returning two members, falls within the Westhoughton division of the county. Before 1838, when Bolton was incorporated, the town was governed by a borough-reeve and two constables appointed at the annual court-leet. The county borough was created in 1888. The corporation consists of a mayor, 24 aldermen and 72 councillors.

The earliest form of the name is Bodleton or Botheltun, and the most important of the later forms are Bodeltown, Botheltun-le-Moors, Bowelton, Boltune, Bolton-super-Moras, Bolton-in-ye-Moors, Bolton-le-Moors. The manor was granted by William I. to Roger de Poictou, and passed through the families of Ferrers and Pilkington to the Harringtons of Hornby Castle, who lost it with their other estates for their adherence to Richard III. In 1485 Henry VII. granted it to the first earl of Derby. The manor is now held by different lords, but the earls of Derby still have a fourth part. The manor of Little Bolton seems to have been, at least from Henry III.'s reign, distinct from that of Great Bolton, and was held till the 17th century by the Botheltons or Boltons.

From early days Bolton was famous for its woollen manufactures. In Richard I.'s reign an aulneger, whose duty it was to measure and stamp all bundles of woollen goods, was appointed, and it is clear, therefore, that the place was already a centre of the woollen cloth trade. In 1337 the industry received an impulse from the settlement of a party of Flemish clothiers, and extended so greatly that when it was found necessary in 1566 to appoint by act of parliament deputies to assist the aulnegers, Bolton is named as one of the places where these deputies were to be employed. Leland in his *Itinerary* (1558) recorded the fact that Bolton made cottons, which were in reality woollen goods. Real cotton goods were not made in Lancashire till 1641, when Bolton is named as the chief seat of the manufacture of fustians, vermilions and dimities. After the revocation of the edict of

Nantes the settlement of some French refugees further stimulated this industry. It was here that velvets were first made about 1756, by Jeremiah Clarke, and muslins and cotton quiltings in 1763. The cotton trade received an astonishing impetus from the inventions of Sir Richard Arkwright (1770), and Samuel Crompton (1780), both of whom were born in the parish. Soon after the introduction of machinery, spinning factories were erected, and the first built in Bolton is said to have been set up in 1780. The number rapidly increased, and in 1851 there were 66 cotton mills with 860,000 throstle spindles at work. The cognate industry of bleaching has been carried on since early in the 18th century, and large ironworks grew up in the latter half of the 19th century. In 1791 a canal was constructed from Manchester to Bolton, and by an act of parliament (1792) Bolton Moor was enclosed.

During the Civil War Bolton sided with the parliament, and in February 1643 and March 1644 the royalist forces assaulted the town, but were on both occasions repulsed. On the 28th of May 1644, however, it was attacked by Prince Rupert and Lord Derby, and stormed with great slaughter. On the 15th of October 1651 Lord Derby, who had been taken prisoner after the battle of Worcester, was brought here and executed the same day.

Up to the beginning of the 19th century the market day was Monday, but the customary Saturday market gradually superseded this old chartered market. In 1251 William de Ferrers obtained from the crown a charter for a weekly market and a yearly fair, but gradually this annual fair was replaced by four others chiefly for horses and cattle. The New Year and Whitsuntide Show fairs only arose during the 19th century.

BOLTON ABBEY, a village in the West Riding of Yorkshire, England, 22 m. N.W. from Leeds and 5½ from Ilkley by the Midland railway. It takes its name, inaccurately, from the great foundation of Bolton Priory, the ruins of which are among the most exquisitely situated in England. They stand near the right bank of the upper Wharfe, the valley of which is beautifully wooded and closely enclosed by hills. The earliest part of the church is of transitional Norman date; the nave, which is perfect, is Early English and Decorated. The transepts and choir are ruined, and the remains of domestic buildings are slight. The manor of Bolton Abbey with the rest of the district of Craven was granted by William the Conqueror to Robert de Romili, who evidently held it in 1086, although there is no mention made of it in the Domesday survey. William de Meschines and Cicely de Romili, his wife, heiress of Robert, founded and endowed a priory at Embsay or Emmesay, near Skipton, in 1120, but it was moved here in 1151 by their daughter, Alice de Romili, wife of William FitzDuncan, who gave the manor to the monks in exchange for other lands. After the dissolution of the monasteries the manor was sold in 1542 to Henry Clifford, 2nd earl of Cumberland, whose descendants, the dukes of Devonshire, now hold it.

See J.D. Whitaker, LL.D., F.S.A., *History of the District of Craven* (ed. Morant, 1878); Dugdale's *Monasticon Anglicanum*.

BOLZANO, BERNHARD (1781-1848), Austrian priest and philosopher, was born at Prague on the 5th of October 1781. He distinguished himself at an early age, and on his ordination to the priesthood (1805) was appointed professor of the philosophy of religion in Prague University. His lectures, in which he endeavoured to show that Catholic theology is in complete harmony with reason, were received with eager interest by the younger generation of thinkers. But his views met with much opposition; and it was only through the protection of the archbishop, Prince Salm-Salm, that he was enabled to retain his chair. In 1820 he was accused of being connected with some of the students' revolutionary societies, and was compelled to resign. Several doctrines extracted from his works were condemned at Rome, and he was suspended from his priestly functions, spending the rest of his life in literary work. He died at Prague on the 18th of December 1848. The most important of his numerous works are the *Wissenschaftslehre, oder Versuch einer neuen Darstellung der Logik*, advocating a scientific method in the study of logic (4 vols., Sulzbach, 1837); the *Lehrbuch der Religionswissenschaft* (4 vols., Sulzbach, 1834), a philosophic representation of all the dogmas of Roman Catholic theology; and *Athanasia, oder Gründe für die Unsterblichkeit der Seele* (2nd ed., Mainz, 1838). In philosophy he followed Reinhard in ethics and the monadology of Leibnitz, though he was also influenced by Kant.

See *Lebensbeschreibung des Dr Bolzano* (an autobiography, 1836); Wisshaupt, *Skizzen aus dem Leben Dr Bolzanos* (1850); Palágy, *Kant und Bolzano* (Halle, 1902).

BOMA (properly *Mboma*), a port on the north bank of the river Congo about 60 m. from its mouth, the administrative capital of Belgian Congo. Pop. about 5000. It was one of the places at which the European traders on the west coast of Africa established stations in the 16th and 17th centuries. It became the entrepôt for the commerce of the lower Congo and a well-known mart for slaves. The trade was chiefly in the hands of Dutch merchants, but British, French and Portuguese firms also had factories there. No European power exercised sovereignty, though shadowy claims were from time to time put forward by Portugal (see AFRICA, § 5). In 1884 the natives of Boma granted a protectorate of their country to the International Association of the Congo.

See H.M. Stanley, *The Congo and the Founding of its Free State* (London, 1885).

BOMB, a term formerly used for an explosive shell (see AMMUNITION) fired by artillery. The word is derived from the Gr. βόμβος, a hammering, buzzing noise, cf. "bombard" (*q.v.*). At the present day it is most frequently used of a shattering or incendiary grenade, or of an explosive vessel actuated by clockwork or trip mechanism, employed to destroy life or property. In naval warfare, before the introduction of the shell gun, explosive projectiles were carried principally by special vessels known as bomb-vessels, bombards or, colloquially, bombs.

In geology, the name "bomb" is given to certain masses of lava which have been hurled forth from a volcanic vent by explosive action. In shape they are spheroidal, ellipsoidal or discoidal; in structure they may be solid, hollow or more or less cavernous; whilst in size they vary from that of a walnut to masses weighing several tons. It is generally held that the form is partly due to rotation of the mass during its aerial flight, and in some cases the bomb becomes twisted by a gyratory movement. According, however, to Dr H.J. Johnston-Lavis, many of the so-called bombs of Vesuvius are not projectiles, but merely globular masses formed in a stream of lava; and in like manner Professor J.D. Dana showed that what were regarded as bombs in Hawaii are in many cases merely lava-balls that have not been hurled through the air. Certain masses of pumice ejected from Vulcano have been called by Johnston-Lavis "bread-crust bombs," since they present a coating of obsidian which has been bent and cracked in a way suggestive of the crust of a roll. It is probable that here the acid magma was expelled in a very viscous condition, and the crust which formed on cooling was burst by the steam from the occluded water. Some of the bombs thrown out during recent eruptions of Etna consist of white granular quartz, encased in a black scoriaceous crust, the quartz representing an altered sandstone. The bombs of granular olivine, found in some of the tuffs in the Eifel, are represented in most geological collections (see VOLCANO).

BOMBARD (derived through Med. Lat. and Fr. forms from Gr. βομβεῖν, to make a humming noise), a term applied in the middle ages to a sort of cannon, used chiefly in sieges, and throwing heavy stone balls; hence the later use as a verb (see BOMBARDMENT). The name, in various forms, was also given to a medieval musical instrument ("bombard," "bumhart," "pumhart," "pommer"), the forerunner of the bass oboe or schalmey. At the present day a small primitive oboe called *bombarde*, with eight holes but no keys, is used among the Breton peasants.

BOMBARDIER, originally an artilleryman in charge of a bombard; now a non-commissioned officer in the artillery of the British army, ranking below a corporal.

BOMBARDMENT, an attack by artillery fire directed against fortifications, troops in position or towns and buildings. In its strict sense the term is only applied to the bombardment of defenceless or undefended objects, houses, public buildings, &c., the object of the assailant being to dishearten his opponent, and specially to force the civil population and authorities of a besieged place to persuade the military commandant to capitulate before the actual defences of the place have been reduced to impotence. It is, therefore, obvious that mere bombardment can only achieve its object when the amount of suffering inflicted upon non-combatants is sufficient to break down their resolution, and when the commandant permits himself to be influenced or coerced by the sufferers. A threat of bombardment will sometimes induce a place to surrender, but instances of its fulfilment being followed by success are rare; and, in general, with a determined commandant, bombardments fail of their object. Further, an intentionally terrific fire at a large target, unlike the slow, steady and minutely accurate "artillery attacks "directed upon the fortifications, requires the expenditure of large quantities of ammunition, and wears out the guns of the attack. Bombardments are, however, frequently resorted to in order to test the temper of the garrison and the civil population, a notable instance being that of Strassburg in 1870. The term is often loosely employed to describe artillery attacks upon forts or fortified positions in preparation for assaults by infantry.

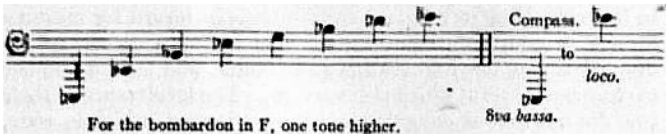
BOMBARDON, or BASS TUBA, the name given to the bass and contrabass of the brass wind in military bands, called in the orchestra bass tuba.

The name of bombardon is unquestionably derived from *bombardone*, the Italian for contrabass pommer (bombard), which, before the invention of the fagotto, formed the bass of medieval orchestras; it is also used for a bass reed stop of 16 ft. tone on the organ. The bombardon was the very first bass wind instrument fitted with valves, and it was at first known as the *corno basso*, *clavicor* or *bass horn* (not to be confounded with the bass horn with keys, which on being perfected became the ophicleide). The name was attached more to the position of the wind instruments as bass than to the individual instrument. The original corno basso was a brass instrument of narrow bore with the pistons set horizontally. The valve-ophicleide in F of German make had a wider bore and three vertical pistons, but it was only a "half instrument," measuring about 12 ft. A. Kalkbrenner, in his life of W. Wieprecht (1882), states that in the Jäger military bands of Prussia the corno basso (keyed bass horn) was introduced as bass in 1829, and the bombardon (or valve-ophicleide) in 1831; in the Guards these instruments were superseded in 1835 by the bass tuba invented by Wieprecht and J.G. Moritz.

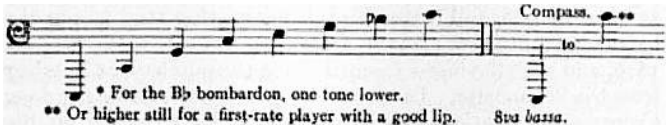
The modern bombardon is made in two forms: the upright model, used in stationary band music; and the circular model, known as the helicon, worn round the body with the large bell resting on the left shoulder, after the style of the Roman *cornu* (see Horn), which is a more convenient way of carrying this heavy instrument when marching. The bombardon, and the euphonium, of which it is the bass, are the outcome of the application of valves to the bugle family whereby the saxhorns were also produced. The radical difference between the saxhorns and the tubas (including the bombardon) is that the latter have a sufficiently wide conical bore to allow of the production of fundamental sounds in a rich, full quality of immense power. This difference, first recognized in Germany and Austria, has given rise in those countries to the classification of the brass wind as "half" and "whole" instruments (*Halbe* and *Ganze Instrumente*). When the brass wind instruments with conical bore and cup-shaped mouthpiece first came into use, it was a well-understood principle that the tube of each instrument must theoretically be made twice as long as an organ pipe giving the same note; for example, the French horn sounding the 8 ft. C of an 8 ft. organ pipe, must have a tube 16 ft. long; C then becomes the second harmonic of the series for the 16 ft. tube, the first or fundamental being unobtainable. After the introduction of pistons, instrument-makers experimenting with the bugle, which has a conical bore of very wide diameter in proportion to the length, found that baritone and bass instruments constructed on the same principle gave out the fundamental full and clear. A new era in the construction of brass wind instruments was thus inaugurated, and now that the proportions of the bugle have been adopted, the tubes of the tubas are made just half the length of those of the older instruments, corresponding to the length of the organ pipe of the same pitch, so that a euphonium sounding 8 ft. C no longer needs to be 16 ft. long but only 8 ft. The older instruments, such as the saxhorns, with narrow bore, have therefore been denominated "half instruments," because only half the length of the instrument is of practical utility, while the tubas with wide bore are styled "whole instruments." [1] Bombardons are made in E flat and F of the 16 ft. octave, corresponding to the orchestral bass tuba, double bass in strings, and pedal clarinet and contrafagotto in the wood wind. The bombardon in B flat or C, an octave lower than the euphonium, corresponds to the contrabass tuba in the orchestra.

The bombardons possess a chromatic compass of 3½ to 4 octaves. The harmonic series consists of the harmonics from the 1st to the 8th.

Bombardon in E Flat.



Harmonic Series of the Contrabass Bombardon in C.*



The lowest notes produced by the valves are very difficult to obtain, for the lips seldom have sufficient power to set in vibration a column of air of such immense length, at a rate of vibration slow enough to synchronize with that of notes of such deep pitch.[2] Even when they are played, the lowest valve notes can hardly be heard unless doubled an octave higher by another bombardon.

Bombardons are generally treated as non-transposing instruments, the music being written as sounded, except in France and Belgium, where transposition is usual. The intervening notes are obtained by means of pistons or valves, which, on being depressed, either admit the wind into additional lengths of tubing to lower the pitch, or cut off a length in order to raise it. Bombardons usually have three or four pistons lowering the pitch of the instrument respectively 1, ½, 1½ and 2½ tones (in Belgium, 1, ½, 2 and 3 tones). The valve system, disposal of the tubing and shape and position of the bell differ considerably in the various models of well-known makers. In Germany and Austria[3] what is known as the cylinder action is largely used; for the piston or pump is substituted a four-way brass cock operated by means of a key and a series of cranks.

In order to obtain a complete chromatic scale throughout the compass, there must be, as on the slide-trombone, seven different positions or lengths of tubing available, each having its harmonic series. These different lengths are obtained on the bombardon by means of a combination of pistons: the simultaneous use of Nos. 2 and 3 lowers the pitch two tones; of Nos. 1, 2 and 3, three tones; of Nos. 1, 2, 3, 4, five and a half tones, &c. A combination of pistons, however, fails to give the interval with an absolutely correct intonation, since the length of tubing thrown open is not of the theoretical length required to produce it. Many ingenious contrivances have been invented from time to time to remedy this inherent defect of the valve system, such as the six-valve independent system of Adolphe Sax; the Besson *Registre*, giving eight independent positions; the Besson compensating system *Transpositeur*; the Boosey automatic compensating piston invented by D.J. Blaikley, and V. Mahillon's automatic regulating pistons. More recently the Besson enharmonic valve system, with six independent tuning slides and three pistons, and Rudall, Carte & Company's new (Klussmann's patent) bore, conical throughout the open tube and additional lengths, have produced instruments which leave nothing to be desired as to intonation. (See Valves and Tuba.)

1 See Dr E. Schafhäutl's article on Musical Instruments, section 4 of *Bericht der Beurtheilungscommission bei der Allg. deutschen Industrie-Ausstellung*, 1854 (Munich, 1855), pp. 169-170; also Friedr. Zamminer, *Die Musik und die Musikinstrumente in ihrer Beziehung zu den Gesetzen der Akustik* (Giessen, 1855), p. 313.

2 V.C. Mahillon, *Eléments d'acoustique musicale et instrumentale* (Bruxelles, 1874), p. 153.

3 The bombardon is used in the military bands of Austria, but in those of Germany it has been superseded by a bass tuba differing slightly in form and construction from the bombardons and bass tubas used in England, France, Belgium and Austria.

BOMBAY CITY, the capital of Bombay Presidency, and the chief seaport of western India, situated in 18° 55′ N. and 72° 54′ E. The city stands on an island of the same name, which forms one of a group now connected by causeways with the mainland. The area is 22 sq. m.; and the population of the town and island (1901) 776,006 (estimate in 1906, 977,822). Bombay is the second most populous city in the Indian empire, having fallen behind Calcutta at the census of 1901. Its position on the side of India nearest to Europe, its advantages as a port and a railway centre, and its monopoly of the cotton industry, are counteracted by the fact that the region which it serves cannot vie with the valley of the Ganges in point of fertility and has no great waterway like the Ganges or Brahmaputra. Nevertheless Bombay pushes Calcutta hard for supremacy in point of population and commercial prosperity.

The Bombay Island, or, as it ought to be more correctly called, the Bombay Peninsula, stands out from a coast ennobled by lofty hills, and its harbour is studded by rocky islands and precipices, whose peaks rise to a great height. The approach from the sea discloses one of the finest panoramas in the world,—the only European analogy being the Bay of Naples. The island consists of a plain about 11 m. long by 3 broad, flanked by two parallel lines of low hills. A neck of land stretching towards the south-west forms the harbour on its eastern side, sheltering it from the force of the open sea, and enclosing an expanse of water from 5 to 7 m. wide. At the south-west of the island, Back Bay, a shallow basin rather more than 2 m. in breadth, runs inland for about 3 m. between the extreme points of the two ranges of hills. On a slightly raised strip of land between the head of Back Bay and the harbour is situated the fort, the nucleus of the city of Bombay. From this point the land slopes westward towards the central plain, a low-lying tract, which before the construction of the embankment known as the Hornby Vellard, used at high tide to be submerged by the sea. The town itself consists of well-built and unusually handsome native bazaars, and of spacious streets devoted to European commerce. In the native bazaar the houses rise three or four storeys in height, with elaborately carved pillars and front work. Some of the European hotels and commercial buildings are on the American scale, and have no rival in any other city of India. The Taj Mahal hotel, which was built by the Tata family in 1904, is the most palatial and modern hotel in India. The private houses of the European residents lie apart alike from the native and from the mercantile quarters of the town. As a rule, each is built in a large garden or compound; and although the style of architecture is less imposing than that of the stately residences in Calcutta, it is well suited to the climate, and has a beauty and comfort of its own. The favourite suburb is Malabar hill, a high ridge running out into the sea, and terraced to the top by handsome houses, which command one of the finest views, of its kind, in the world. Of recent years wealthy natives have been competing with Europeans for the possession of this desirable quarter. To the right of this ridge, looking towards the sea, runs another suburb known as Breach Candy, built close upon the beach and within the refreshing sound of the waves. To the left of Malabar hill lies Back Bay, with a promontory on its farther shore, which marks the site of the old Bombay Fort; its walls are demolished, and the area is chiefly devoted to mercantile buildings. Farther round the island, beyond the fort, is Mazagon Bay, commanding the harbour, and the centre of maritime activity. The defences of the port, remodelled and armed with the latest guns, consist of batteries on the islands in the harbour, in addition to which there are three large batteries on the mainland. There is also a torpedo-boat detachment stationed in the harbour.

No city in the world has a finer water-front than Bombay. The great line of public offices along the esplanade and facing Back Bay, which are in the Gothic style mixed with Saracenic, are not individually distinguished for architectural merit, but they have a cumulative effect of great dignity. The other most notable buildings in the city are the Victoria terminus of the Great Indian Peninsula railway and the Taj Mahal hotel. Towards the northern end of Malabar hill lie the Parsee Towers of Silence, where the Parsees expose their dead till the flesh is devoured by vultures, and then cast the bones into a well where they crumble into dust. The foundation-stone of a museum was laid by the prince of Wales in 1905.

Local Government.—The port of Bombay (including docks and warehouses) is managed by a port trust, the members of which are nominated by the government from among the commercial community. The municipal government of the city was framed by an act of the Bombay legislative council passed in 1888. The governing body consists of a municipal corporation and a town council. The corporation is composed of 72 members, of whom 16 are nominated by the government. Of the remainder, 36 are elected by the ratepayers, 16 by the justices of the peace, 2 by the senate of the university, and 2 by the chamber of commerce. The council, which forms the standing committee of the corporation, consists of 12 members, of whom 4 are nominated by the government and the rest elected by the corporation. The members of the corporation include Europeans, Hindus, Mahommedans and Parsees. The Bombay University was constituted in 1857 as an examining body, on the model of the university of London. The chief educational institutions in Bombay City are the government Elphinstone College, two missionary colleges (Wilson and St Xavier), the Grant medical college, the government law school, the Sir Jamsetjee Jeejeebhoy school of art, and the Victoria Jubilee technical institute.

Docks.—The dockyard, originally built in 1736, has a sea-face of nearly 700 yds. and an area of about 200 acres. There are five graving docks, three of which together make one large dock 648 ft. long, while the other two make a single dock 582 ft. long. There are also four building slips opposite the Apollo Bandar (landing-place) on the south-east side of the enclosure. The dockyard is lighted by electricity, so that work can be carried

on by night as well as day. Bombay is the only important place near the sea in India where the rise of the tide is sufficient to permit docks on the largest scale. The highest spring tides here reach 17 ft., but the average is 14 ft. Prince's dock, of which the foundation-stone was laid by the prince of Wales in 1875, was opened in 1879, and is 1460 ft. long by 1000 ft. broad, with a water area of 30 acres; while the Victoria dock, which was completed and opened in 1887-1888, has a water area of 25 acres. South of the Victoria dock, the foundation-stone of the Alexandra dock, the largest in India, was laid by the prince of Wales in 1905.

Cotton Mills.—The milling industry is, next to the docks, the chief feature of Bombay's commercial success. The staple manufacture is cotton-spinning, but in addition to this there are flour mills and workshops to supply local needs. The number of factories increased from fifty-three in 1881 to eighty-three in 1890, and that decade saw the influx of a great industrial population from the surrounding districts; but the decade 1891-1901 witnessed at least a temporary set-back owing to the ravages caused by plague and the effects of over-production. In addition to the actual mortality it inflicted, the plague caused an exodus of the population from the island, disorganized the labour at the docks and in the mills, and swallowed up large sums which were spent by the municipality on plague operations and sanitary improvements. After 1901, however, both population and trade began to revive again. In 1901 there were 131,796 persons employed in the cotton industry.

Population.—Owing to its central position between East and West and to the diversity of races in India, no city in the world can show a greater variety of type than Bombay. The Mahratta race is the dominant element next to the European rulers, but in addition to them are a great and influential section of Parsee merchants, Arab traders from the Gulf, Afghans and Sikhs from northern India, Bengalis, Rajputs, Chinese, Japanese, Malays, negroes, Tibetans, Sinhalese and Siamese. Bombay is the great port and meeting-place of the Eastern world. Out of the large sections of its population, Hindu, Mahommedan, Parsee, Jain and Christian, the Parsees are one of the smallest and yet the most influential. They number only some 46,000 all told, but most of the great business houses are owned by Parsee millionaires and most of the large charities are founded by them.

History.—The name of the island and city of Bombay is derived from Mumba (a form of Parvati), the goddess of the Kolis, a race of husbandmen and fishermen who were the earliest known inhabitants, having occupied the island probably about the beginning of the Christian era. Bombay originally consisted of seven islands (the *Heptanesia* of Ptolemy) and formed an outlying portion of the dominions of successive dynasties dominant in western India: Satavahanas, Mauryas, Chalukyas and Rashtrakutas. In the Maurya and Chalukya period (450-750) the city of Puri on Elephanta Island was the principal place in Bombay harbour. The first town built on Bombay Island was Mahikavati (Mahim), founded by King Bhima, probably a member of the house of the Yadavas of Deogiri, as a result of Ala-ud-din Khilji's raid into the Deccan in 1294. It remained under Hindu rule until 1348, when it was captured by a Mahommedan force from Gujarat; and the islands remained part of the province (later kingdom) of Gujarat till 1534, when they were ceded by Sultan Bahadur to the Portuguese.

The island did not prosper under Portuguese rule. By the system known as *aforamento* the lands were gradually parcelled out into a number of fiefs granted, under the crown of Portugal, to individuals or to religious corporations in return for military service or equivalent quit-rents. The northern districts were divided among the Franciscans and Jesuits, who built a number of churches, some of which still survive. The intolerance of their rule did not favour the growth of the settlement, which in 1661, when it was transferred to the British, had a population of only 10,000. The English had, however, long recognized its value as a naval base, and it was for this reason that they fought the battle of Swally (1614-1615), attempted to capture the place in 1626, and that the Surat Council urged the purchase of Bombay from the Portuguese. In 1654 the directors of the Company drew Cromwell's attention to this suggestion, laying stress on the excellence of its harbour and its safety from attack by land. It finally became the property of the British in 1661 as part of the dowry of the infanta Catherine of Portugal on her marriage to Charles II., but was not actually occupied by the British until 1665, when they experienced much difficulty in overcoming the opposition of the Portuguese, and especially of the religious orders, to the cession. In 1668 it was transferred by the crown to the East India Company, who placed it under the factory of Surat.

The real foundation of the modern city dates from this time, and was the work of Gerald Aungier (or Angier), brother of Francis Aungier, 3rd Lord Aungier of Longford and 1st earl of Longford in Ireland (d. 1700), who succeeded Sir George Oxenden as president of Surat in 1669 and died in 1677. At this time Bombay was threatened by the Mahrattas from inland, by the Malabar pirates and the Dutch from the sea, and was cut off from the mainland by the Portuguese, who still occupied the island of Salsette and had established a customs-barrier in the channel between Bombay and the shore. In spite of the niggardly policy of the court of directors, who refused to incur the expense of employing skilled engineers, Aungier succeeded in fortifying the town and shore; he also raised a force of militia and regulars, the latter mainly Germans (as more trustworthy than the riffraff collected in London by the Company's crimps). In 1672 Aungier transferred his headquarters to Bombay, and after frightening off an imposing Dutch fleet, which in 1670 attempted to surprise the island, set to work to organize the settlement anew. To this task he brought a mind singularly enlightened and a sincere belief in the best traditions of English liberty. In its fiscal policy, in its religious intolerance, and in its cruel and contemptuous treatment of the natives, Portuguese rule had been alike oppressive. Aungier altered all this. With the consent of "a general assembly of the chief representatives of the people" he commuted the burdensome land tax for a fixed money payment; he protected all castes in the celebration of their religious ceremonies; and he forbade any compulsion of natives to carry burdens against their will. The result was that the population of Bombay increased rapidly; a special quarter was set apart for the banya, or capitalist, class of Hindus; while Parsees and Armenians flocked to a city where they were secure of freedom alike for their trade and their religion. Within eight years the population had grown from 10,000 to 60,000. The immediate result of this concentration of people in a spot so unwholesome was the prevalence of disease, produced by the appalling sanitary conditions. This, too, Aungier set himself to remedy. In 1675 he initiated the works for draining the foul tidal swamps; and, failing the consent of the Company to the erection of a regular hospital, he turned the law court into an infirmary. He also set up three courts of justice: a tribunal for petty causes under a factor with native assessors, a court of appeal under the deputy governor and members of council, and a court-martial. A regular police force was also established and a gaol built in the Bazaar.[1]

During this period, however, the position of Bombay was sufficiently precarious. The Malabar pirates, though the city itself was too strong for them, were a constant menace to its trade; and it required all the genius of

Aungier to maintain the settlement, isolated as it was between the rival powers of the Mahrattas and the Mogul empire. After his death, on the 30th of June 1677, its situation became even more precarious. Even under Aungier the Siddi admirals of the Moguls had asserted their right to use Bombay harbour as winter quarters for their fleet, though they had failed to secure it as a base against the Mahrattas. Under his weak successor (Rolt, 1677-1682), the English waters, the value of which had now been proved, became the battle-ground between the rival navies, and for some years Bombay lay at the mercy of both. The Company's rule, moreover, was exposed to another danger. The niggardly policy of the board of directors, more intent on peaceful dividends than on warlike rule, could not but be galling to soldiers of fortune. A mutiny at Bombay in 1674 had only been suppressed by the execution of the ringleader; and in 1683 a more formidable movement took place under Richard Keigwin, a naval officer who had been appointed governor of St Helena in reward for the part played by him in the capture of the island from the Dutch in 1673. Keigwin, elected governor of Bombay by popular vote, issued a proclamation in the king's name, citing the "intolerable extortions, oppressions and exactions" of the Company, and declaring his government under the immediate authority of the crown. He ruled with moderation, reformed the system of taxation, obtained notable concessions from the Mahrattas, and increased the trade of the port by the admission of "interlopers." But he failed to extend the rebellion beyond Bombay; and when a letter arrived, under the royal sign manual, ordering him to surrender the fort to Sir John Child, appointed admiral and captain-general of the Company's forces, he obeyed.[2]

Meanwhile the Company had decided to consider Bombay as "an independent settlement, and the seat of the power and trade of the English in the East Indies." But a variety of causes set back the development of the city, notably the prevalence of plague and cholera due to the silting up of the creeks that divided its component islands; and it was not till after the amalgamation of the old and new companies in 1708 that the governor's seat was transferred from Surat to Bombay. In 1718 the city wall was completed; settlers began to stream in, especially from distracted Gujarat; and a series of wise administrative reforms increased this tendency until in 1744 the population, which in 1718 had sunk to 16,000, had risen to 70,000. Meanwhile the Mahratta conquest of Bassein and Salsette (1737-1739) had put a stop to the hostility of the Portuguese, and a treaty of alliance with the Siddis (1733) had secured a base of supplies on the mainland. The French wars of 1744-1748 and 1756-1763 led to a further strengthening of the fortifications; and the influx of settlers from the mainland made the questions of supplies and of the protection of trade from piracy more pressing. The former was in part settled by the acquisition of Bankot (1755) as a result of an alliance with the peshwa, the latter by the successful expedition under Watson and Clive against Vijayadrug (1756). During this period, too, the importance of Bombay as a naval base, long since recognized, was increased by the building of a dock (1750), a second being added in 1762. The year 1770 saw the beginning of the cotton trade with China, the result of a famine in that country, the Chinese government having issued an edict commanding more land to be used for growing grain. This, too, was a period of searching reforms in the administration and the planning and building of the city; the result being a further immense growth of its population, which in 1780 was 113,000. This was still further increased by the famine of 1803, which drove large numbers of people from Konkan and the Deccan to seek employment in Bombay. A great fire broke out in the fort in the same year and caused enormous loss; but it enabled the government to open wider thoroughfares in the more congested parts, and greatly stimulated the tendency of the natives to build their houses and shops outside the walls of the fort in what are now some of the busiest parts of the city.

The British victory over the Mahrattas and the annexation of the Deccan opened a new period of unrestricted development for Bombay. At this time, too (1819), its fortunes were vigorously fostered by Mountstuart Elphinstone, and in 1838 the population had risen to 236,000. But in the next fifty years it more than doubled itself, the figures for 1891 being 821,000. This great leap was due to the influence of railways, of which the first line was completed in 1853, the opening of the Suez Canal, and the foundation of cotton factories. In 1866-1867 the tide of prosperity was interrupted by a financial crisis, due to the fall in the price of cotton on the termination of the American war. Bombay, however, soon recovered herself, and in 1891 was more prosperous than ever before; but during the ensuing decade great havoc was played by plague (*q.v.*) with both her population and her trade. In addition to a decline of 6% in the population, the exports also declined by 7%, whereas Calcutta's exports rose during the same period by 38%.

See S.M. Edwardes, *The Rise of Bombay* (1902); James Douglas, *Bombay and Western India* (1893); G.W. Forrest, *Cities of India* (1903); Sir William Hunter, *History of British India* (London, 1900); *Imp. Gazetteer of India* (Oxford, 1908), *s.v.* "Bombay City."

1 Hunter, *Hist. of British India*, ii. pp. 212, &c.

2 See Hunter, op. cit. ii. 205, &c. He received a full pardon, was appointed later to the command of a frigate in the royal navy, and fell while leading the assault on St Christopher's (June 21, 1690).

BOMBAY FURNITURE. "Bombay blackwood furniture" is a term applied to a rather extensive class of articles manufactured in the city of Bombay and in the towns of Surat and Ahmedabad in India. The wood used is Shisham or blackwood (*Dalbergia*), a hard-grained dark-coloured timber which with proper treatment assumes a beautiful natural polish. Much of the so-called Bombay furniture is clumsy and inelegant in form, defects which it is suggested by experts, like Sir George Birdwood, it owes to the circumstance that the original models were Dutch. Some of the smaller articles, such as flower stands, small tables, and ornamental stands, are, however, of exceedingly graceful contour, and good examples are highly prized by collectors. The carving at its best is lace-like in character, and apart from its inherent beauty is attractive on account of the ingenuity shown by the worker in adapting his design in detail to the purpose of the article he is fashioning. The workmen who manufacture the most artistic Bombay furniture are a special class with inherited traditions. Often a man knows only one design, which has been transmitted to him by his father, who in his turn had had it from his father before him. In recent years under European auspices efforts have been made with a certain measure of success to modernize the industry by introducing portions of the native work into furniture of Western design.

In the main, however, the conventional patterns are still adhered to. “Bombay boxes” are inlaid in geometrical patterns on wood. The inlaying materials consist of the wire, sandal wood, sapan wood, ebony, ivory and stags’ horns, and the effect produced by the combination of minute pieces of these various substances is altogether peculiar and distinctive.

BOMBAY PRESIDENCY, a province or presidency of British India, consisting partly of British districts, and partly of native states under the administration of a governor. This territory extends from 13° 53′ to 28° 45′ N., and from 66° 40′ to 76° 30′ E., and is bounded on the N. by Baluchistan, the Punjab and Rajputana; on the E. by Indore, the Central Provinces and Hyderabad; on the S. by Madras and Mysore; and on the W. by the Arabian Sea. Within these limits lie the Portuguese settlements of Diu, Damaun and Goa, and the native state of Baroda which has direct relations with the government of India; while politically Bombay includes the settlement of Aden. The total area, including Sind but excluding Aden, is 188,745 sq. m., of which 122,984 sq. m. are under British and 65,761 under native rule. The total population (1901) is 25,468,209, of which 18,515,587 are resident in British territory and 6,908,648 in native states. The province is divided into four commissionerships and twenty-six districts. The four divisions are the northern or Gujarat, the central or Deccan, the southern or Carnatic, and Sind. The twenty-six districts are: Bombay City, Ahmedabad, Broach, Kaira, Panch Mahals, Surat, Thana, Ahmednagar, Khandesh (partitioned into two districts in 1906), Nasik, Poona, Satara, Sholapur, Belgaum, Bijapur, Dharwar, Kanara, Kolaba, Ratnagiri, Karachi, Hyderabad, Shikarpur, Thar and Parkar, and Upper Sind Frontier. The native states comprise in all 353 separate units, which are administered either by political agents or by the collectors of the districts in which the smaller states are situated. The chief groups of states are North Gujarat, comprising Cutch, Kathiawar agency, Palanpur agency, Mahi Kantha agency, Rewa Kantha agency and Cambay; South Gujarat, comprising Dharampur, Bansda and Sachin; North Konkan, Nasik and Khandesh, comprising Khandesh political agency, Surgana and Jawhar; South Konkan and Dharwar, comprising Janjira, Sawantwari and Savanur; the Deccan Satara Jagirs, comprising Akalkot, Bhor, Aundh, Phaltan, Jath and Daphlapur; the southern Mahratta states, comprising Kolhapur and other states, and Khairpur in Sind. The native states under the supervision of the government of Bombay are divided, historically and geographically, into two main groups. The northern or Gujarat group includes the territories of the gaekwar of Baroda, with the smaller states which form the administrative divisions of Cutch, Palanpur, Rewa Kantha, and Mahi Kantha. These territories, with the exception of Cutch, have an historical connexion, as being the allies or tributaries of the gaekwar in 1805, when final engagements were included between that prince and the British government. The southern or Mahratta group includes Kolhapur, Akalkot, Sawantwari, and the Satara and southern Mahratta Jagirs, and has an historical bond of union in the friendship they showed to the British in their final struggle with the power of the peshwa in 1818. The remaining territories may conveniently be divided into a small cluster of independent zamin-daris, situated in the wild and hilly tracts at the northern extremity of the Sahyadri range, and certain principalities which, from their history or geographical position, are to some extent isolated from the rest of the presidency.

Physical Aspects.—The Bombay Presidency consists of a long strip of land along the Indian Ocean from the south of the Punjab to the north of Mysore. The coast is rock-bound and difficult of access; and though it contains several bays forming fairweather ports for vessels engaged in the coasting trade, Bombay, Karachi-in-Sind, Marmagoa and Karwar alone have harbours sufficiently land-locked to protect shipping during the prevalence of the south-west monsoon. The coast-line is regular and little broken, save by the Gulfs of Cambay and Cutch, between which lies the peninsula of Kathiawar.

Mountains.

Speaking generally, a range of hills, known as the Western Ghats, runs down the coast, at places rising in splendid bluffs and precipices from the water’s edge, at others retreating inland, and leaving a flat fertile strip of 5 to 50 m. between their base and the sea. In the north of the presidency on the right bank of the Indus, the Hala mountains, a continuation of the great Suleiman range, separate British India from the dominions of the khan of Kalat. Leaving Sind, and passing by the ridges of low sandhills,—the leading feature of the desert east of the Indus,—and the isolated hills of Cutch and Kathiawar, which form geologically the western extremity of the Aravalli range, the first extensive mountain range is that separating Gujarat from the states of central India. The rugged and mountainous country south of the Tapti forms the northern extremity of the Sahyadri or Western Ghats. This great range of hills, sometimes overhanging the ocean, and generally running parallel to it at a distance nowhere exceeding 50 m., with an average elevation of about 1800 ft., contains individual peaks rising to more than double that height. They stretch southwards for upwards of 500 m., with a breadth of 10 to 20 m. The western declivity is abrupt, the land at the base of the hills being but slightly raised above the level of the sea. As is usually the case with the trap formation, they descend to the plains in terraces with abrupt fronts. The landward slope is in many places very gentle, the crest of the range being sometimes but slightly raised above the level of the plateau of the Deccan. Their best-known elevation is Mahabaleshwar, 4500 ft. high, a fine plateau, 37 m. from Poona, covered with rich vegetation, and used by the Bombay government as its summer retreat and sanitarium. In the neighbourhood of the Sahyadri hills, particularly towards the northern extremity of the range, the country is rugged and broken, containing isolated peaks, masses of rock and spurs, which, running eastward, form watersheds for the great rivers of the Deccan. The Satpura hills separate the valley of the Tapti from the valley of the Nerbudda, and the district of Khandesh from the territories of Indore. The Satmala or Ajanta hills, which are rather the northern slope of the plateau than a distinct range of hills, separate Khandesh from the Nizam’s Dominions.

Plains.

The more level parts of Bombay consist of five well-demarcated tracts—Sind, Gujarat, the Konkan, the Deccan, and the Carnatic. Sind, or the lower valley of the Indus, is very flat, with but scanty vegetation, and depending for productiveness entirely on irrigation. Gujarat, except on its northern parts, consists of rich, highly cultivated alluvial plains, watered by the Tapti and Nerbudda, but not much subject to inundation. The Konkan lies between the Western Ghats and the sea. It is a rugged and difficult country, intersected by creeks, and abounding in isolated peaks and detached ranges of

hills. The plains of the Deccan and Khandesh are watered by large rivers, but as the rainfall is uncertain, they are generally, during the greater part of the year, bleak and devoid of vegetation. The Carnatic plain, or the country south of the river Kistna, consists of extensive tracts of black or cotton soil in a high state of cultivation.

Rivers.

The chief river of western India is the Indus, which enters the presidency from the north of Sind and flowing south in a tortuous course, falls into the Arabian Sea by several mouths, such as the Ghizri creek, Khudi creek, Pitiani creek, Sisa creek, Hajamro creek, Vatho creek, Mall creek, Wari creek, Bhitiara creek, Sir creek and Khori creek. In the dry season the bed varies at different places from 480 to 1600 yds. The flood season begins in March and continues till September, the average depth of the river rising from 9 to 24 ft., and the velocity of the current increasing from 3 to 7 m. an hour. Next to the Indus comes the Nerbudda. Rising in the Central Provinces, and traversing the dominions of Holkar, the Nerbudda enters the presidency at the north-western extremity of the Khandesh district, flows eastward, and after a course of 700 m. from its source, falls into the Gulf of Cambay, forming near its mouth the alluvial plain of Broach, one of the richest districts of Bombay. For about 100 m. from the sea the Nerbudda is at all seasons navigable by small boats, and during the rains by vessels of from 30 to 50 tons burden. The Tapti enters the presidency a few miles south of the town of Burhanpur, a station on the Great Indian Peninsula railway, flows eastward through the district of Khandesh, the native state of Rewa Kantha and the district of Surat, and falls into the Gulf of Cambay, a few miles west of the town of Surat. The Tapti drains about 250 m. of country, and is, in a commercial point of view, the most useful of the Gujarat rivers. Besides these there are many minor streams. The Banas and the Saraswati take their rise in the Aravalli hills, and flowing eastward through the native state of Palanpur, fall into the Runn of Cutch. The Sabarmati and the Mahi rise in the Mahi Kantha hills, and flowing southwards, drain the districts of Northern Gujarat, and fall into the sea near the head of the Gulf of Cambay. The streams which, rising in the Sahyadri range, or Western Ghats, flow westward into the Arabian Sea, are of little importance. During the rains they are formidable torrents, but with the return of the fair weather they dwindle away, and during the hot season, with a few exceptions, they almost dry up. Clear and rapid as they descend the hills, on reaching the lowlands of the Konkan they become muddy and brackish creeks. The Kanarese rivers have a larger body of water and a more regular flow than the streams of the Konkan. One of them, the Sharawati, forcing its way through the western ridge of the Ghats, plunges from the high to the low country by a succession of falls, the principal of which is 800 ft. in height. The Sahyadri, or Western Ghats, also throw off to the eastward the two principal rivers of the Madras Presidency, the Godavari and the Kistna. These rivers collect countless tributary streams, some of them of considerable size, and drain the entire plain of the Deccan as they pass eastward towards the Bay of Bengal.

Lakes.

The Manchar Lake is situated on the right bank of the Indus. During inundations it attains a length of 20 m., and a breadth of 10, covering a total area estimated at 180 sq. m. But the most peculiar lacustrine feature of the presidency is the Runn or Lake of Cutch, which, according to the season of the year, is a salt marsh, an inland lake, or an arm of the sea with an area of 8000 sq. m. It forms the western boundary of the province of Gujarat, and when flooded during the rains unites the Gulfs of Cutch and Cambay, and converts the territory of Cutch into an island.

Geology.—South of Gujarat nearly the whole of Bombay is covered by the horizontal lava flows of the Deccan Trap series, and these flows spread over the greater part of the Kathiawar peninsula and extend into Cutch. In Cutch and Kathiawar they are underlaid by Jurassic and Neocomian beds. The Jurassic beds are marine and contain numerous Ammonites, but the beds which are referred to the Neocomian include a series of sandstones and shales with remains of plants. Several of the plants are identical with forms which occur in the upper portion of the Gondwana system. Tertiary limestones, sandstones and shales overlie the Deccan Trap in Cutch, but the greatest development of deposits of this age is to be met with on the western side of the Indus (see SIND). The plain of Sind and of eastern Gujarat is covered by alluvium and wind-blown sand.

Climate.—Great varieties of climate are met with in the presidency. In its extreme dryness and heat, combined with the aridity of a sandy soil, Upper Sind resembles the sultry deserts of Africa. The mean maximum temperature at Hyderabad, in Lower Sind, during the six hottest months of the year, is 98° F. in the shade, and the water of the Indus reaches blood heat; in Upper Sind it is even hotter, and the thermometer has been known to register 130° in the shade. In Cutch and in Gujarat the heat, though less, is still very great. The Konkan is hot and moist, the fall of rain during the monsoon sometimes approaching 300 in. The table-land of the Deccan above the Ghats, on the contrary, has an agreeable climate except in the hot months, as has also the southern Mahratta country; and in the hills of Mahabaleshwar, Singarh, and other detached heights, Europeans may go out at all hours with impunity. Bombay Island itself, though in general cooled by the sea breeze, is oppressively hot during May and October. The south-west monsoon generally sets in about the first week in June, and pours down volumes of rain along the coast. From June to October travelling is difficult and unpleasant, except in Sind, where the monsoon rains exert little influence.

Forests.—Bombay Presidency possesses two great classes of forests—those of the hills and those of the alluvial plains. The hill forests are scattered over a wide area, extending from 23° to 14° N. lat. Most of them lie among the Sahyadri hills or Western Ghats. The alluvial forests lie in Sind, on or close to the banks of the Indus, and extend over an area of 550 sq. m. The principal timber trees in the forests are—teak; blackwood of two varieties (*Dalbergia Sisu* and *Dalbergia latifolia*), *Dalbergia ujainensis, Pterocarpus Marsupium, Terminalia glabra, Acacia arabica, Acacia Catechu, Nauclea cordifolia, Nauclea parvifolia, Bidelia spinosa, Hardwickia binata, Juga xylocarpa, Populus euphratica*, and *Tamarindus indica*. The forests contain many trees which, on account of their fruits, nuts or berries, are valuable, irrespective of the quality of their timber. Among these are the mango (*Mangifera indica*); the jack (*Artocarpus integrifolia*), *Zizypkus Jujuba, Aegle Marmelos, Terminalia Chebula, Calophyllum Inophyllum, Bassia latifolia* and *Pongamia glabra*. The jungle tribes collect gum from several varieties of trees, and in Sind the Forest Department derives a small revenue from lac. The palms of the presidency consist of cocoa-nut, date, palmyra and areca catechu.

Population.—The census of 1901 gave a total of 25,468,209, out of which the chief religions furnished the following numbers:—

Hindu	19,916,438
Mahommedan	4,567,295
Jain	535,950

Zoroastrian	78,552
Christian	216,118

In Sind Islam has been the predominant religion from the earliest Arab conquest in the 8th century. In Gujarat the predominant religion is Hinduism, though petty Mahommedan kingdoms have left their influence in many parts of the province. The Deccan is the home of the Mahrattas, who constitute 30% of the population. The Konkan is notable for various Christian castes, owing their origin to Portuguese rule; while in the Carnatic, Lingayatism, a Hindu reformation movement of the 12th century, has been embraced by 45% of the population. The Mahrattas are the dominating race next to the Europeans and number (1901) 3,650,000, composed of 1,900,000 Kunbis, 350,000 Konkanis, and 1,400,000 Mahrattas not otherwise specified.

Languages.—The chief languages of the presidency are Sindhi in Sind, Cutchi in Cutch, Gujarati and Hindustani in Gujarat, Mahratti in Thana and the central division, Gujarati and Mahratti in Khandesh, and Mahratti and Kanarese in the southern division. There are also Bhil (120,000) and Gipsy (30,000) dialects.

Agriculture.—The staple crops are as follows:—Joar (*Sorghum vulgare*) and bajra (*Holcus spicatus*) are the staple food grains in the Deccan and Khandesh. Rice is the chief product of the Konkan. Wheat, generally grown in the northern part of the Presidency, but specially in Sind and Gujarat, is exported to Europe in large quantities from Karachi, and on a smaller scale from Bombay. Barley is principally grown in the northern parts of the presidency. Nachani (*Eleusine coracana*) and kodra (*Paspalum serobiculatum*), inferior grains grown on the hill-sides, furnish food to the Kolis, Bhils, Waralis, and other aboriginal tribes. Of the pulses the most important are gram (*Cicer arietinum*), tur (*Cajanus indicus*), kulti (*Dolichos biflorus*), and mug (*Phaseolus Mungo*). Principal oil-seeds: til (*Sesamum orientale*), mustard, castor-oil, safflower and linseed. Of fibres the most important are cotton, Deccan hemp (*Hibiscus cannabinus*), and sunn or tag (*Crotalaria juncea*). Much has been done to improve the cotton of the presidency. American varieties have been introduced with much advantage in the Dharwar collectorate and other parts of the southern Mahratta country. In Khandesh the indigenous plant from which one of the lowest classes of cotton in the Bombay market takes its name has been almost entirely superseded by the superior Hinganghat variety. Miscellaneous crops: sugar-cane, requiring a rich soil and a perennial water-supply, and only grown in favoured localities, red pepper, potatoes, turmeric and tobacco.

Manufactures.—The chief feature of the modern industrial life of Bombay is the great development in the growth and manufacture of cotton. Large steam mills have rapidly sprung up in Bombay City, Ahmedabad and Khandesh. In 1905 there were 432 factories in the presidency, of which by far the greater number were engaged in the preparation and manufacture of cotton. The industry is centred in Bombay City and Island, which contains nearly two-thirds of the mills. During the decade 1891-1901 the mill industry passed through a period of depression due to widespread plague and famine, but on the whole there has been a marked expansion of the trade as well as a great improvement in the class of goods produced. In addition to the mills there are (1901) 178,000 hand-loom weavers in the province, who still have a position of their own in the manipulation of designs woven into the cloth. Silk goods are manufactured in Ahmedabad, Surat, Yeola, Nasik, Thana and Bombay, the material being often decorated with printed or woven designs; but owing to the competition of European goods most branches of the industry are declining. The custom of investing savings in gold and silver ornaments gives employment to many goldsmiths; the metal is usually supplied by the customer, and the goldsmith charges for his labour. Ahmedabad and Surat are famous for their carved wood-work. Many of the houses in Ahmedabad are covered with elaborate wood-carving, and excellent examples exist in Broach, Baroda, Surat, Nasik and Yeola. Salt is made in large quantities in the government works at Kharaghoda and Udu in Ahmedabad, whence it is exported by rail to Gujarat and central India. There is one brewery at Dapuri near Poona.

Railways and Irrigation.—The province is well supplied with railways, all of which, with one exception, concentrate at Bombay City. The exception is the North-Western line, which enters Sind from the Punjab and finds its natural terminus at Karachi. The other chief lines are the Great Indian Peninsula, Indian Midland, Bombay, Baroda & Central India, Rajputana-Malwa & Southern Mahratta systems. In 1905 the total length of railway under the Bombay government open for traffic was 7980 m. These figures do not include the railway system in Sind. With the exception of Sind, the water-supply of the Bombay Presidency does not lend itself to the construction of large irrigation works.

Army.—Under Lord Kitchener’s re-arrangement of the Indian army in 1904 the old Bombay command was abolished and its place was taken by the Western army corps under a lieutenant-general. The army corps was divided into three divisions under major-generals. The 4th division, with headquarters at Quetta, comprises the troops in the Quetta and Sind districts. The 5th division, with headquarters at Mhow, consists of three brigades, located at Nasirabad, Jubbulpore and Jhansi, and includes the previous Mhow, Deesa, Nagpur, Nerbudda and Bundelkhand districts, with the Bombay district north of the Tapti. The 6th division, with headquarters at Poona, consists of three brigades, located at Bombay, Ahmednagar and Aden. It comprises the previous Poona district, Bombay district south of the Tapti, Belgaum district north of the Tungabhadra, and Dharwar and Aurungabad districts.

Education.—The university of Bombay, established in 1857, is a body corporate, consisting of a chancellor, vice-chancellor and fellows. The governor of Bombay is *ex officio* chancellor. The education department is under a director of public instruction, who is responsible for the administration of the department in accordance with the general educational policy of the state. The native states have generally adopted the government system. Baroda and the Kathiawar states employ their own inspectors. In 1905 the total number of educational institutions was 10,194 with 593,431 pupils. There are ten art colleges, of which two are managed by government, three by native states, and five are under private management. According to the census of 1901, out of a population of 25½ millions nearly 24 millions were illiterate.

Administration.—The government of Bombay is administered by a governor in council consisting of the governor as president and two ordinary members. The governor is appointed from England; the council is appointed by the crown, and selected from the Indian civil service. These are the executive members of government. For making laws there is a legislative council, consisting of the governor and his executive council, with certain other persons, not fewer than eight or more than twenty, at least half of them being non-officials. Each of the members of the executive council has in his charge one or two departments of the government; and

each department has a secretary, an under-secretary, and an assistant secretary, with a numerous staff of clerks. The political administration of the native states is under the superintendence of British agents placed at the principal native courts; their position varies in different states according to the relations in which the principalities stand with the paramount power. The administration of justice throughout the presidency is conducted by a high court at Bombay, consisting of a chief justice and seven puisne judges, along with district and assistant judges throughout the districts of the presidency. The administration of the districts is carried on by collectors, assistant collectors, and a varying number of supernumerary assistants.

History.—In the earliest times of which any record remains the greater part of the west coast of India was occupied by Dravidian tribes, living under their kings in fortified villages, carrying on the simpler arts of life, and holding a faith in which the propitiation of spirits and demons played the chief part. There is evidence, however, that so early as 1000 B.C. an export trade existed to the Red Sea by way of East Africa, and before 750 B.C. a similar trade had sprung up with Babylon by way of the Persian Gulf. It was by this latter route that the traders brought back to India the Brahmi alphabet, the art of brick-making and the legend of the Flood. Later still the settlement of Brahmans along the west coast had already Aryanized the country in religion, and to some extent in language, before the Persian conquest of the Indus valley at the close of the 6th century B.C. The Persian dominion did not long survive; and the march of Alexander the Great down the Indus paved the way for Chandragupta and the Maurya empire. Under this empire Ujjain was the seat of a viceroy, a prince of the imperial house, who ruled over Kathiawar, Malwa and Gujarat. On the death of Asoka in 231 B.C. the empire of the Mauryas broke up, and their heritage in the west fell to the Andhra dynasty of the Satavahanas of Paithan on the Godavari, a Dravidian family whose dominion by 200 B.C. stretched across the peninsula from the deltas of the Godavari and Kistna to Nasik and the Western Ghats. About A.D. 210, however, their power in the west seems to have died out, and their place was taken by the foreign dynasty of the Kshaharatas, the Saka satraps of Surashtra (Kathiawar), who in 120 had mastered Ujjain and Gujarat and had built up a rival kingdom to the north. Since about A.D. 40 the coast cities had been much enriched by trade with the Roman empire, which both the Satavahanas and the satraps did much to encourage; but after the fall of Palmyra (273) and the extinction of the main Kshaharata dynasty (*c.* 300) this commerce fell into decay. The history of the century and a half that follows is very obscure; short-lived Saka dynasties succeeded one another until, about 388, the country was conquered by the Guptas of Magadha, who kept a precarious tenure of it till about 470, when their empire was destroyed by the White Huns, or Ephthalites (*q.v.*), who, after breaking the power of Persia and assailing the Kushan kingdom of Kabul, poured into India, conquered Sind, and established their dominion as far south as the Nerbudda.

Under the Hun tyranny, which lasted till the overthrow of the White Huns on the Oxus by the Turks (*c.* 565), native dynasties had survived, or new ones had established themselves. In Kathiawar a chief named Bhatarka, probably of foreign origin, had established himself at Valabhi (Wala) on the ruins of the Gupta power (*c.* 500), and founded a dynasty which lasted until it was overthrown by Arab invaders from Sind in 770.[1] The northern Konkan was held by the Mauryas of Puri near Bombay, the southerly coast by the Kadambas of Vanavasi, while in the southern Deccan Chalukyas and Rashtrakutas struggled for the mastery. A new power, too, appeared from the north: the Gurjaras (ancestors, it is supposed, of the Gujar caste), who had probably entered India with the White Huns, established their power over Gujarat and (*c.* 600) overran north-eastern Kathiawar, made the raja of Valabhi their tributary, and established a branch at Broach (585-740). During the short-lived empire of Harsha (d. 647 or 648), Malwa, Gujarat and Kathiawar were subject to his sway; but the southern boundary of his kingdom was the Nerbudda, south of which the Chalukyas in the 7th century, having overcome the Rashtrakutas and other rivals, had absorbed the smaller kingdoms into their empire. In 710-711 (92 A.H.) the Arabs invaded India, and in 712 conquered and established themselves in Sind; they did not, however, attempt any serious attack on the Gurjara and Chalukya empires, confining themselves to more or less serious raids. In 770 they destroyed the city of Valabhi and, as already mentioned, brought its dynasty to an end. Meanwhile the Chalukyas, after successfully struggling with the Pallavas (whose capital was taken by Vikramaditya II., *c.* 740), had in their turn succumbed to their ancient rivals the Rashtrakutas, who succeeded to the bulk of their dominions, including Gujarat, where they had set up a branch line. For some two centuries (*c.* 750-950) there was a balance of power between the Gurjaras and Rashtrakutas, neither kingdom being strong enough to encroach on the other to any extent. The Rashtrakutas were, moreover, debarred from large schemes of conquest by dissensions with the branch dynasty which they had set up in Gujarat and by the constant threat of attack by the Chalukyas from Mysore. Nevertheless their power and magnificence (they were notable builders and patrons of literature) greatly impressed the Arabs, by whom the king was known as Balhara (*i.e. Vallhaba*, "well-beloved"), a title borrowed from the preceding dynasty. Under them the Konkan and the coast farther south were governed by chiefs of the Silahara family, whose rule is mainly notable for the revival of trade with the Persian Gulf and, doubtless as a result of this, the arrival in 775 on the west coast of a number of Parsee refugees, who found, in a country where three religions were already equally honoured, the toleration denied to them in Mussulman Persia. But in the 10th century the Rashtrakuta power began to break up; in 961 Mularaja Solanki (Chalukya) conquered the kingdom of Anhilvada (Anhilvara) in Gujarat, where his dynasty reigned till 1242; and twelve years later the Chalukyas once more overthrew the Rashtrakutas in the Deccan, establishing their capital at Kalyani, while a branch line was set up in southern Gujarat. Farther south the Silaharas, however, continued to rule the coast, and succeeded in maintaining their independence until after the final fall of the Chalukyas in 1192. The cause of the downfall of the dynasty, splendid and enlightened as any of its predecessors, was the system of governing by means of great feudatories, which also proved fatal to the Solanki rajas of Anhilvada. From 1143 onward the power of the latter had been overshadowed by that of the Vaghela chiefs of Dholka, and during the same period the Deccan had been rapidly lapsing into absolute anarchy, amid which rival chiefs struggled for the supreme power. In the end the Yadavas of Devagiri (Daulatabad) prevailed, and in 1192 established a short-lived empire to which the Dholka princes were ultimately forced to become tributary.

But meanwhile a new power had appeared, which was destined to establish the Mussulman domination in western and southern India. In 1023 Mahmud of Ghazni had already invaded Gujarat with a large army, destroyed the national Hindu idol of Somnath, and carried away an immense booty. Mahommed Ghori also invaded Gujarat, and left a garrison in its capital. But it was not till after the Mussulman power was firmly established in northern India that the Mahommedan sovereigns of Delhi attempted the conquest of the south. In 1294 the emperor Ala-ud-din first invaded the Deccan, and in 1297 he conquered Gujarat. In 1312 the

Mahommedan arms were triumphant through the Mahratta country; and seven years later the whole of Malabar fell a prey to the invaders. In the middle of the 14th century the weakness of the Delhi sovereigns tempted the governors of provinces to revolt against their distant master, and to form independent kingdoms. In this way the Bahmani kingdom was established in the Deccan, and embraced a part of the Bombay presidency. Ahmednagar and Gujarat also became the seats of a new kingdom. In 1573 Akbar conquered Gujarat and reannexed it to the empire; in 1599 he effected the reconquest of Khandesh, and in 1600 that of Ahmednagar. From this time the country was never tranquil, and Ahmednagar became the focus of constant rebellions. During the latter part of the 17th century the Mahrattas rose into power, and almost every part of the country now comprising the presidency of Bombay fell under their sway. In 1498 the Portuguese came first to Calicut, their earliest possession in the presidency being the island of Anjidiv. After their victory at Diu over the Egyptian fleet their mastery of the Indian Ocean was undisputed, and they proceeded to establish themselves on the coast. They captured Goa in 1510, Malacca in 1511, and Ormuz in 1515. They next took advantage of the decay of the kingdom of Gujarat to occupy Chaul (1531), Bassein with its dependencies, including Bombay (1534), Diu (1535) and Daman (1559). But the inherent vices of their intolerant system undermined their power, even before their Dutch and English rivals appeared on the scene.

The first English settlement in the Bombay presidency was in 1618, when the East India Company established a factory at Surat, protected by a charter obtained from the emperor Jahangir. In 1626 the Dutch and English made an unsuccessful attempt to gain possession of the island of Bombay, and in 1653 proposals were suggested for its purchase from the Portuguese. In 1661 it was ceded to the English crown, as part of the dower of the infanta Catherine of Portugal on her marriage with Charles II. So lightly was the acquisition esteemed in England, and so unsuccessful was the administration of the crown officers, that in 1668 Bombay was transferred to the East India Company for an annual payment of £10. At the time of the transfer, powers for its defence and for the administration of justice were also conferred; a European regiment Vas enrolled; and the fortifications erected proved sufficient to deter the Dutch from their intended attack in 1673 (see Bombay City: History). In 1687 Bombay was placed at the head of all the Company’s possessions in India; but in 1753 the government of Bombay became subordinate to that of Calcutta. The first collision of the English with the Mahratta power was in 1774 and resulted in 1782 in the treaty of Salbai, by which Salsette was ceded to the British, while Broach was handed over to Sindhia. More important were the results of the second Mahratta war, which ended in 1803. Surat had already been annexed in 1800; the East India Company now received the districts of Broach, Kaira, &c.

In 1803 the Bombay presidency included only Salsette, the islands of the harbour (since 1774), Surat and Bankot (since 1756); but between this date and 1827 the framework of the presidency took its present shape. The Gujarat districts were taken over by the Bombay government in 1805 and enlarged in 1818; and the first measures for the settlement of Kathiawar and Mahi Kantha were taken between 1807 and 1820. Baji Rao, the last of the peshwas, who had attempted to shake off the British yoke, was defeated, captured and pensioned (1817-1818), and large portions of his dominions (Poona, Ahmednagar, Nasik, Sholapur, Belgaum, Kaladgi, Dharwar, &c.) were included in the presidency, the settlement of which was completed by Mountstuart Elphinstone, governor from 1819 to 1827. His policy was to rule as far as possible on native lines, avoiding all changes for which the population was not yet ripe; but the grosser abuses of the old régime were stopped, the country was pacified, the laws were codified, and courts and schools were established. The period that followed is notable mainly for the enlargement of the presidency through the lapse of certain native states, by the addition of Aden (1839) and Sind (1843), and the lease of the Panch Mahals from Sindhia (1853). The establishment of an orderly administration, one outcome of which was a general fall of prices that made the unwonted regularity of the collection of taxes doubly unwelcome, naturally excited a certain amount of misgiving and resentment; but on the whole the population was prosperous and contented, and under Lord Elphinstone (1853-1860) the presidency passed through the crisis of the Mutiny without any general rising. Outbreaks among the troops at Karachi, Ahmedabad and Kolhapur were quickly put down, two regiments being disbanded, and the rebellions in Gujarat, among the Bhils, and in the southern Mahratta country were local and isolated. Under Sir Bartle Frere (1862-1867) agricultural prosperity reached its highest point, as a result of the American Civil War and the consequent enormous demand for Indian cotton in Europe. The money thus poured into the country produced an epidemic of speculation known as the “Share Mania” (1864-1865), which ended in a commercial crisis and the failure of the bank of Bombay (1866). But the peasantry gained on the whole more than they lost, and the trade of Bombay was not permanently injured. Sir Bartle Frere encouraged the completion of the great trunk lines of railways, and with the funds obtained by the demolition of the town walls (1862) he began the magnificent series of public buildings that now adorn Bombay.

During recent times the entire history of Bombay has been sadly affected by plague and famine. Bubonic plague, of a fatal and contagious nature, first broke out in Bombay City in September 1896, and, despite all the efforts of the government, quickly spread to the surrounding country. Down to the end of October 1902 over 531,000 deaths had taken place due to plague. In 1903-1904 there were 426,387 cases with 316,523 deaths, and 1904-1905 there were 285,897 cases with 212,948 deaths. The great cities of Bombay, Karachi and Poona suffered most severely. A few districts in Gujarat almost entirely escaped; but the mortality was very heavy in Satara, Thana, Surat, Poona, Kolaba, and in the native states of Cutch, Baroda, Kolhapur and Palanpur. The only sanitary measure that can be said to have been successful was complete migration, which could only be adopted in villages and smaller towns. Inoculation was extensively tried in some cases. Segregation was the one general method of fighting the disease; but, unfortunately, it was misunderstood by the people and led to some deplorable outbreaks. In Poona, during 1897, two European officials were assassinated; the editor of a prominent native paper was sentenced to imprisonment for sedition; and two leaders of the Brahman community were placed in confinement. At Bombay, in March 1898, a riot begun by Mahommedan weavers was not suppressed until several Europeans had been fatally injured. In Nasik district, in January 1898, the native chairman of the plague committee was brutally murdered by a mob. But on the whole the people submitted with characteristic docility to the sanitary regulations of the government. Bombay, like the Central Provinces, suffered from famine twice within three years. The failure of the monsoon of 1896 caused widespread distress throughout the Deccan, over an area of 46,000 sq. m., with a population of 7 millions. The largest number of persons on relief was 301,056 in September 1897; and the total expenditure on famine relief was Rs. 1,28,000,000. The measures adopted were signally successful, both in saving life and in mitigating distress. In 1899 the monsoon again failed in Gujarat, where famine hitherto had been almost unknown; and the winter

rains failed in the Deccan, so that distress gradually spread over almost the entire presidency. The worst feature was a virulent outbreak of cholera in Gujarat, especially in the native states. In April 1900 the total number of persons in receipt of relief was 1,281,159 in British districts, 566,671 in native states, and 71,734 in Baroda. For 1900-1901 the total expenditure on famine relief was nearly 3 crores (say, £2,000,000 sterling); and a continuance of drought necessitated an estimate of 1 crore in the budget of the following year. The Bombay government exhausted its balances in 1897, and was subsequently dependent on grants from the government of India.

See Sir James Campbell, *Gazetteer of Bombay* (26 vols., 1896); S.M. Edwardes, *The Rise of Bombay* (1902); James Douglas, *Bombay and Western India* (1893); and Sir William Lee-Warner, *The Presidency of Bombay* (Society of Arts, 1904); *The Imperial Gazetteer of India* (Oxford, 1908); and for the early history, V.A. Smith, *The Early History of India* (2nd ed., Oxford, 1908).

1 V.A. Smith, *Early History of India*, p. 295.

BOMBAZINE, or Bombasine, a stuff originally made of silk or silk and wool, and now also made of cotton and wool or of wool alone. Good bombazine is made with a silk warp and a worsted weft. It is twilled or corded and used for dress-material. Black bombazine has been used largely for mourning, but the material has gone out of fashion. The word is derived from the obsolete French *bombasin*, applied originally to silk but afterwards to "tree-silk" or cotton. Bombazine is said to have been made in England in Queen Elizabeth's reign, and early in the 19th century it was largely made at Norwich.

BOMBELLES, MARC MARIE, Marquis de (1744-1822), French diplomatist and ecclesiastic, was the son of the comte de Bombelles, tutor and guardian of the duke of Orleans. He was born at Bitsch in Lorraine, and served in the army through the Seven Years' War. In 1765 he entered the diplomatic service, and after several diplomatic missions became ambassador of France to Portugal in 1786, being charged to win over that country to the Family Compact; but the madness of the queen and then the death of the king prevented his success. He was transferred to Vienna early in 1789, but the Revolution cut short his diplomatic career, and he was deprived of his post in September 1790. He remained attached to Louis XVI., and was employed on secret missions to other sovereigns, to gain their aid for Louis. In 1792 he emigrated, and after Valmy lived in retirement in Switzerland. In 1804, after the death of his wife, he withdrew to the monastery of Brünn in Austria, and became bishop of Oberglogau in Prussia. In 1815 he returned to France, and became bishop of Amiens (1819). He died in Paris in 1822.

His son, Louis Philippe, comte de Bombelles (1780-1843), born at Regensburg, passed his life in the diplomatic service of Austria. In 1814 he became Austrian ambassador to Denmark, and in 1816 filled a similar position at Dresden.

(E. Es.)

BOMBERG, DANIEL, a famous Christian printer of Hebrew books. His chief activity was in Venice between 1516 and 1549 (the year of his death). Bomberg introduced a new era in Hebrew typography. Among other great enterprises, he published the *editio princeps* (1516-1517) of the rabbinical Bible (Hebrew text with rabbinical commentaries, &c.). He also produced the first complete edition of the Talmud (1520-1523).

BONA, JOHN (1609-1674), Italian cardinal and author, was born at Mondovi in Piedmont, on the 10th of October 1609. In 1624 he joined the Congregation of Feuillants and was successively elected prior of Asti, abbot of Mondovi and general of his order. He was created cardinal in 1669 by Clement IX., and during the conclave, which followed that pope's death, was regarded as a possible candidate for the papacy. He died on the 27th of October 1674. Bona's writings are mainly concerned with liturgical and devotional subjects. Of the numerous editions of his works, the best are those of Paris (1677), Turin (1747) and Antwerp (1777). Stores of interesting rubrical information, interspersed with verses and prayers, are to be found in the *De Libris Liturgicis* and the *Divina Psalmodia*; recent advances in liturgical studies, however, have somewhat lessened their value. The *De Discretione Spirituum* treats of certain higher phases of mysticism; the *Via Compendii ad Deum* was well translated in 1876 by Henry Collins, O. Cist., under the title of *An Easy Way to God*. Sir Roger L'Estrange's translation (*The Guide to Heaven*, 1680) of the *Manuductio ad Coelum* was reprinted in 1898, and a new edition of the *Principia Vitae Christianae*, ed. by D. O'Connor, appeared in 1906. The devotional treatise *De Sacrificio Missae* is the classical work in its field (new edition by Ildephonsus Cummins, 1903).

The chief source for the life of Bona is the biography by the Cistercian abbot Bertolotti (Asti, 1677); the best

modern study is by A. Ighina (Mondovi, 1874).

BONA (Bône), a seaport of Algeria, in 36° 53′ N., 7° 46′ E., on a bay of the Mediterranean, chief town of an arrondissement in the department of Constantine, 220 m. by rail W. of Tunis, and 136 m. N.E. of Constantine. The town, which is situated at the foot of the wooded heights of Edugh, is surrounded with a modern rampart erected outside the old Arab wall, the compass of which was found too small for its growth. Much of the old town has been demolished, and its general character now is that of a flourishing French city. The streets are wide and well laid out, but some are very steep. Through the centre of the town runs a broad tree-lined promenade, the Cours Jérôme-Bertagna, formerly the Cours National, in which are the principal buildings — theatre, banks, hotels. At its southern end, by the quay, is a bronze statue of Thiers, and at the northern end, the cathedral of St Augustine, a large church built in quasi-Byzantine style. In it is preserved a relic supposed to be the right arm of St Augustine, brought from Pavia in 1842. The Grand Mosque, built out of ruins of the ancient Hippo, occupies one side of the chief square, the Place d'Armes. There are barracks with accommodation for 3000 men, and civil and military hospitals. The Kasbah (citadel) stands on a hill at the north-east of the town. The inner harbour, covering 25 acres, is surrounded by fine quays at which vessels drawing 22 ft. can be moored. Beyond is a spacious outer harbour, built 1857-1868 and enlarged in 1905-1907. 191
Bona is in direct steamship communication with Marseilles, and is the centre of a large commerce, ranking after Algiers and Oran alone in Algeria. It imports general merchandise and manufactures, and exports phosphates, iron, zinc, barley, sheep, wool, cork, esparto, &c. There are manufactories of native garments, tapestry and leather. The marshes at the mouths of the Seybuse and Bujema rivers, which enter the sea to the south of Bona, have been drained by a system of canals, to the improvement of the sanitary condition of the town, which has the further advantage of an abundant water supply obtained from the Edugh hills. There are cork woods and marble quarries in the vicinity, and the valley of the Seybuse and the neighbouring plains are rich in agricultural produce. The population of the town of Bona in 1906 was 36,004, of the commune 42,934, of the arrondissement, which includes La Calle (*q.v.*) and 11 other communes, 77,803.

Bona is identified with the ancient *Aphrodisium*, the seaport of *Hippo Regius* or *Ubbo*, but it derives its name from the latter city, the ruins of which, consisting of large cisterns, now restored, and fragments of walls, are about a mile to the south of the town. In the first three centuries of the Christian era Hippo was one of the richest cities in Roman Africa; but its chief title to fame is derived from its connexion with St Augustine, who lived here as priest and bishop for thirty-five years. Hippo was captured by the Vandals under Genseric in 431, after a siege of fourteen months, during which Augustine died. Only the cathedral, together with Augustine's library and MSS., escaped the general destruction. The town Avas partially restored by Belisarius, and again sacked by the Arabs in the 7th century. On the top of the hill on which Hippo stood, a large basilica, with chancel towards the west, dedicated to St Augustine, was opened in 1900. An altar surmounted by a bronze statue of the saint has also been erected among the ruins. The place was named Hippo Regius (Royal) by the Romans because it was a favourite residence of the Numidian kings. Bona (Arabic *annaba*, "the city of jujube trees"), which has passed through many vicissitudes, was built by the Arabs, and was for centuries a possession of the rulers of Tunis, who built the Kasbah in 1300. From the beginning of the 14th to the middle of the 15th century it was frequented by Italians and Spaniards, and in the 16th it was held for some time by Charles V., who strengthened its citadel. Thereafter it was held in turn by Genoese, Tunisians and Algerines. From the time of Louis XIV. to the Revolution, the French *Compagnie d'Afrique* maintained a very active trade with the port. The town was occupied by the French for a few months in 1830 and reoccupied in 1832, when Captains Armandy and Yusuf with a small force of marines seized the Kasbah and held it for some months until help arrived. From that time the history of Bona is one of industrial development, greatly stimulated since 1883 by the discovery of the phosphate beds at Tebessa.

BONA DEA, the "good goddess," an old Roman deity of fruitfulness, both in the earth and in women. She was identified with Fauna, and by later syncretism also with Ops and Maia—the latter no doubt because the dedication-day of her temple on the Aventine was 1st May (Ovid, *Fasti*, v. 149 foll.). This temple was cared for, and the cult attended, by women only, and the same was the case at a second celebration at the beginning of December in the house of a magistrate with *imperium*, which became famous owing to the profanation of these mysteries by P. Clodius in 62 B.C., and the political consequences of his act. Wine and myrtle were tabooed in the cult of this deity, and myths grew up to explain these features of the cult, of which an account may be read in W.W. Fowler's *Roman Festivals*, pp. 103 foll. Herbs with healing properties were kept in her temple, and also snakes, the usual symbol of the medicinal art. Her victim was a porca, as in the cults of other deities of fertility, and was called *damium*, and we are told that the goddess herself was known as Damia and her priestess as *damiatrix*. These names are almost certainly Greek; Damia is found worshipped at several places in Greece, and also at Tarentum, where there was a festival called *Dameia*. It is thus highly probable that on the cult of the original Roman goddess was engrafted the Greek one of Damia, perhaps after the conquest of Tarentum (272 B.C.). It is no longer possible to distinguish clearly the Greek and Roman elements in this curious cult, though it is itself quite intelligible as that of an Earth-goddess with mysteries attached.

See also Pauly-Wissowa, *Realencyclopadie*.

(W. W. F.*)

BONA FIDE (Lat. “in good faith”), in law, a term implying the absence of all fraud or unfair dealing or acting. It is usually employed in conjunction with a noun, *e.g.* “bona fide purchaser,” one who has purchased property from its legal owner, to whom he has paid the consideration, and from whom he has taken a legal conveyance, without having any notice of any trust affecting the property; “bona fide holder” of a bill of exchange, one who has taken a bill complete and regular on the face of it, before it was overdue, and in good faith and for value, and without notice of any defect in the title of the person who negotiated it to him; “bona fide traveller” under the licensing acts, one whose lodging-place during the preceding night is at least 3 m. distant from the place where he demands to be supplied with liquor, such distance being calculated by the nearest public thoroughfare.

BONALD, LOUIS GABRIEL AMBROISE, Vicomte de (1754-1840), French philosopher and politician, was born at Le Monna, near Millau in Aveyron, on the 2nd of October 1754. Disliking the principles of the Revolution, he emigrated in 1791, joined the army of the prince of Condé, and soon afterwards settled at Heidelberg. There he wrote his first important work, the highly conservative *Théorie du pouvoir politique et religieux* (3 vols., 1796; new ed., Paris, 1854, 2 vols.), which was condemned by the Directory. Returning to France he found himself an object of suspicion, and was obliged to live in retirement. In 1806 he was associated with Chateaubriand and Fiévée in the conduct of the *Mercure de France*, and two years later was appointed councillor of the Imperial University which he had often attacked. After the restoration he was a member of the council of public instruction, and from 1815 to 1822 sat in the chamber as deputy. His speeches were on the extreme conservative side; he even advocated a literary censorship. In 1822 he was made minister of state, and presided over the censorship commission. In the following year he was made a peer, a dignity which he lost through refusing to take the oath in 1830. From 1816 he had been a member of the Academy. He took no part in public affairs after 1830, but retired to his seat at Le Monna, where he died on the 23rd of November 1840.

Bonald was one of the leading writers of the theocratic or traditionalist school, which included de Maistre, Lamennais, Ballanche and d’Eckstein. His writings are mainly on social and political philosophy, and are based ultimately on one great principle, the divine origin of language. In his own words, “L’homme pense sa parole avant de parler sa pensée”; the first language contained the essence of all truth. From this he deduces the existence of God, the divine origin and consequent supreme authority of the Holy Scriptures, and the infallibility of the church. While this thought lies at the root of all his speculations there is a formula of constant application. All relations may be stated as the triad of cause, means and effect, which he sees repeated throughout nature. Thus, in the universe, he finds the first cause as mover, movement as the means, and bodies as the result; in the state, power as the cause, ministers as the means, and subjects as the effects; in the family, the same relation is exemplified by father, mother and children. These three terms bear specific relations to one another; the first is to the second as the second to the third. Thus, in the great triad of the religious world—God, the Mediator, and Man-God is to the God-Man as the God-Man is to Man. On this basis he constructed a system of political absolutism which lacks two things only:—well-grounded premisses instead of baseless hypotheses, and the acquiescence of those who were to be subjected to it.

Bonald’s style is remarkably fine; ornate, but pure and vigorous. Many fruitful thoughts are scattered among his works, but his system scarcely deserves the name of a philosophy. In abstract thought he was a mere dilettante, and his strength lay in the vigour and sincerity of his statements rather than in cogency of reasoning. 192

He had four sons. Of these, Victor de Bonald (1780-1871) followed his father in his exile, was rector of the academy of Montpellier after the restoration, but lost his post during the Hundred Days. Regaining it at the second restoration, he resigned finally in 1830. He wrote *Des vrais principes opposés aux erreurs du XIX^e^ siècle* (1833), *Moïse et les géologues modernes* (1835), and a life of his father. Louis Jacques Maurice (1787-1870), cardinal (1841), was condemned by the council of state for a pastoral letter attacking Dupin the elder’s *Manuel de droit ecclésiastique*. In 1848 he held a memorial service “for those who fell gloriously in defence of civil and religious liberty.” In 1851 he nevertheless advocated in the senate the maintenance of the temporal power of Rome by force of arms. Henri (d. 1846) was a contributor to legitimist journals; and René was interim prefect of Aveyron in 1817.

Besides the *Théorie* above mentioned, the vicomte de Bonald published *Essai analytique sur les lois naturelles de l’ordre social* (1800); *Législation primitive* (1802); *Du divorce considéré au XIXe siècle* (1801); *Recherches philosophiques sur les premiers objets de connaissances morales* (2 vols., 1818); *Mélanges littéraires et politiques, démonstration philosophique du principe constitutif de la société* (1819, 1852). The first collected edition appeared in 12 vols., 1817-1819; the latest is that of the Abbé Migne (3 vols., 1859).

See *Notice sur M. le Vicomte de Bonald* (1841, ed. Avignon, 1853), (by his son Victor); Damiron, *Phil. en France au XIX^e^ siècle*; Windelband, *History of Philosophy* (trans. J.H. Tufts, 1893); E. Faguet in *Rev. des deux mondes* (April 15, 1889).

BONAPARTE, the name of a family made famous by Napoleon I. (*q.v.*), emperor of the French. The French form Bonaparte was not commonly used, even by Napoleon, until after the spring of 1796. The original name was Buonaparte, which was borne in the early middle ages by several distinct families in Italy. One of these, which settled at Florence before the year 1100, divided in the 13th century into the two branches of San Miniato and Sarzana. A member of this latter, Francesco Buonaparte, emigrated in the middle of the 16th century to Corsica, where his descendants continued to occupy themselves with the affairs of law and the magistracy.

Carlo Buonaparte [Charles Marie de Bonaparte] (1746-1785), the father of Napoleon I., took his degree in law at the university of Pisa, and after the conquest of Corsica by the French became assessor to the royal court of Ajaccio and the neighbouring districts. His restless and dissatisfied nature led him to press or intrigue for other posts, and to embark in risky business enterprises which compromised the fortune of his family for many years to come. In 1764 he married Letizia Ramolino, a beautiful and high-spirited girl, aged fourteen, descended from a well-connected family domiciled in Corsica since the middle of the 15th century. The first two children, born in 1765 and 1767, died in infancy; Joseph (see below), the first son who survived, was born in 1768, and Napoleon in 1769. The latter was born in the midst of the troubles consequent on the French conquest, Letizia having recently accompanied her husband in several journeys and escapes. Her firm and courageous disposition showed itself at that trying time and throughout the whole of her singularly varied career. Simple and frugal in her tastes, and devout in thought and manner of life, she helped to bind her children to the life of Corsica, while her husband, a schemer by nature and a Voltairian by conviction, pointed the way to careers in France, the opening up of which moulded the fortunes of the family and the destinies of Europe. He died of cancer in the stomach at Montpellier in 1785.

Napoleon's father and mother.

Letizia lived to witness the glory and the downfall of her great son, surviving Napoleon I. by sixteen years. She never accommodated herself to the part she was called on to play during the Empire, and, though endowed with immense wealth and distinguished by the title of *Madame Mère*, lived mainly in retirement, and in the exercise of a strict domestic economy which her early privations had made a second nature to her, but which rendered her very unpopular in France and was displeasing to Napoleon. After the events of 1814 she joined the emperor in the island of Elba and was privy to his plans of escape, returning to Paris during the Hundred Days. After the final downfall of Waterloo, she took up her residence at Rome, where Pope Pius VII. treated her with great kindness and consideration, and protected her from the suspicious attentions of the powers of the Grand Alliance. In 1818 she addressed a pathetic letter to the powers assembled at the congress of Aix, petitioning for Napoleon's release, on the ground that his mortal illness had removed any possibility of his ever again becoming a menace to the world's peace. The letter remained unanswered, the powers having reason to believe that it was a mere political move, and that its terms had been previously concerted with Napoleon. Henceforth, saddened by the death of Napoleon, of her daughters Pauline and Elisa, and of several grandchildren, she lived a life of mournful seclusion. In 1829 she was crippled by a serious fall, and was all but blind before her death in 1836.

For the Bonaparte family in general, and Carlo and Letizia, see *Storia genealogica della famiglia Bonaparte, della sua origine fina all' estinzione del ramo già esisente nella città di S. Miniato, scritta da un Samminiatese* (D. Morali) (Florence, 1846); F. de Stefani, *Le antichità dei Bonaparte; precede per una introduzione* (L. Beretta) (Venice, 1857); L. Ambrosini and A. Huard, *La Famille impériale. Hist. de la famille Bonaparte depuis son origine jusqu'en 1860* (Paris, 1860); C. Leynadier, *Histoire de la famille Bonaparte de l'an 1050 à l'an 1848* (*continuée jusqu'en 1866 par de la Brugère*) (Paris, 1866); A. Kleinschmidt, *Die Eltern und Geschwister Napoleons I.* (Berlin, 1876); D.A. Bingham, *The Marriages of the Bonapartes* (2 vols., London, 1881); F. Masson, *Napoléon et sa famille* (4 vols., Paris, 1897-1900); A. Chuquet, *La Jeunesse de Napoléon* (3 vols., Paris, 1897-1899); T. Nasica, *Mémoires sur l'enfance et la jeunesse de Napoléon jusqu'à la âge vingt-trois ans; précédes d'une notice historique sur son père*; Baron H. Larrey, *Madame Mère* (2 vols., Paris, 1892); Clara Tschudi, *Napoleons Mutter: aus dem Norwegischen übersetzt von H. von Lenk* (Leipzig, 1901).

The brothers and sisters of Napoleon I., taken in order of age, are the following:—

I. Joseph (1768-1844), was born at Corte in Corsica, on the 7th of January 1768. He was educated at the college at Autun in France, returned to Corsica in 1784, shortly after the death of his father, and thereafter studied law at the university of Pisa. He became a barrister at Bastia in June 1788, and was soon elected a councillor of the municipality of Ajaccio. Like his brothers, Napoleon and Lucien, he embraced the French or democratic side, and on the victory of the Paolist party fled with his family from Corsica and sought refuge in France. After spending a short time in Paris, where he was disgusted with the excesses of the Jacobins, he settled at Marseilles and married Mlle Julie Clary, daughter of a merchant of that town. The Bonapartes moved from place to place, mainly with the view of concerting measures for the recovery of Corsica. Joseph took part in these efforts and went on a mission to Genoa in 1795. In 1796 he accompanied his brother Napoleon in the early part of the Italian campaign, and had some part in the negotiations with Sardinia which led to the armistice of Cherasco (April 28), the news of which he bore to the French government. Later he proceeded to Leghorn, took part in the French expedition for the recovery of Corsica, and, along with the commissioner of the French Republic, Miot de Melito, helped in the reorganization of that island. In March 1797 he was appointed by the Directory, minister to the court of Parma, and early in the summer he proceeded to Rome in the same capacity. Discords arose between the Vatican and the French Republic, and it is clear that Napoleon and the French Directory ordered Joseph to encourage revolutionary movements in Rome. On the 28th of December 1797 a disturbance took place opposite the French embassy, which led to the death of the French general, Léonard Duphot. Joseph at once left Rome, which soon became a republic. Repairing to Paris, he entered on parliamentary life, becoming one of the members for Corsica in the Council of Five Hundred. He made no mark in the chamber and retired in 1799.

Napoleon's brothers and sisters: 1. Joseph Bonaparte.

Before the *coup d'état* of Brumaire he helped Napoleon in making overtures to Sieyès and Moreau, but otherwise did little. Thereafter he refused to enter the ministry, but became a member of the council of state and of the *Corps Législatif*, where his advice on the state of public opinion was frequently useful. He had a hand in the negotiations for the Concordat, but, according to Lucien Bonaparte, looked on that measure as "ill-advised and retrograde." His services in the diplomatic sphere were more important. At Mortfontaine, his country-house, he concluded with the envoy of the United States a convention which bears that name (1800). He also presided over the negotiations which led to the treaty of Lunéville with Austria (February 9, 1801); and he and Maret represented France in the lengthy discussions with the British envoy, Lord Cornwallis, which resulted in the signature of the treaty of Amiens (March 25, 1802). This diplomatic triumph in its turn led to the consolidation of Napoleon's power as First Consul for life (August 1, 1802) with the chief voice in the selection of his successor. On this question the brothers disagreed. As neither Joseph nor Napoleon had a male heir, the eldest brother, whose ideas of primogeniture were very strict, claimed to be recognized as heir, while Napoleon wished to recognize the son of Louis Bonaparte. On the proclamation of the French empire (May 1804) the

friction became acute. Napoleon offered to make Joseph king of Lombardy if he would waive all claim of succession to the French throne, but met with a firm refusal.

Meanwhile Joseph had striven earnestly, but in vain, to avert a rupture with England, which came about in May 1803. In 1805 he acted as chief of the French government while Napoleon was campaigning in Germany. Early in 1806 he proceeded to Naples with a French force in order to expel the Bourbon dynasty from southern Italy, Napoleon adding the promise that the Neapolitan crown would be for Joseph if he chose to accept it. The conquest of the mainland was speedily effected, though Gaëta, Reggio and the rock of Scylla held out for some months. The Bourbon court retired to Sicily, where it had the protection of a British force. By the decree of the 30th of March 1806 Napoleon proclaimed Joseph king of Naples, but allowed him to keep intact his claims to the throne of France. In several letters he enjoined his brother to greater firmness in his administration: “These peoples in Italy, and in general all nations, if they do not find their masters, are disposed to rebellion and mutiny.” The memoirs of Count Miot de Melito, whom Joseph appointed minister of war, show how great were the difficulties with which the new monarch had to contend—an almost bankrupt treasury, a fickle and degraded populace, Bourbon intrigues and plots, and frequent attacks by the British from Sicily. General Stuart’s victory at Maida (July 3) shook Joseph’s throne to its base; but the surrender of Gaëta soon enabled Massena to march southwards and subdue Calabria. During his brief reign at Naples, Joseph effected many improvements; he abolished the relics of feudalism, reformed the monastic orders, reorganized the judicial, financial and educational systems, and initiated several public works. In everything he showed his desire to carry out the aims which he expressed to his consort in April 1806: “Justice demands that I should make this people as happy as the scourge of war will permit.”

From these well-meant, but not always successful, efforts he was suddenly called away by Napoleon to take the crown of Spain (May 1808). There his difficulties were far greater. Despite the benevolent intentions announced to the Spaniards in his proclamation dated Bayonne, 23rd of June 1808, all reconciliation between them and the French was impossible after Napoleon’s treatment of their *de facto* king, Ferdinand VII. For the varying fortunes of King Joseph in Spain and in the eventful years of the Peninsular War, see Spain and Peninsular War. His sovereignty was little more than titular. Compelled to leave Madrid hastily in August 1808, owing to the Spanish success at Baylen, he was reinstated by Napoleon at the close of the year; and he was thereafter kept in a subordinate position which led him on four occasions to offer to abdicate. The emperor took no notice of these offers, and ordered him to govern with more energy. Between February and May 1810 the emperor placed the northern and north-eastern provinces under the command of French generals as military districts, virtually independent of Joseph’s authority. Again the king protested, but in vain. As his trusted adviser, Miot de Melito, observed in his memoirs, Joseph tried to be constitutional king of Spain, whereas after the experience of the years 1808-1809 he could only succeed in the Peninsula by becoming “the mere instrument of a military power.” “Bearing a title which was only an oppressive burden, the king had in reality ceased to exist as a monarch, and barely retained some semblance of authority over a small part of the French army as a general. Reduced by the exhausted state of his treasury to the last extremity he at length seriously thought of departure.” Joseph took this step in April 1811, and proceeded to Paris in order to extort better terms, or offer his abdication; but he had to return with a monthly subsidy of 500,000 francs and the promise that the army of the centre (the smallest of the five French armies) should be under his control. Late in that year Napoleon united Catalonia to France. Wellington’s victory at Salamanca (July 22, 1812) compelled Joseph to leave his capital; and despite the retirement of the British in the autumn of that year, Joseph’s authority never fully recovered from that blow. The end of his nominal rule came in the next year, when Wellington utterly overthrew the chief French army, commanded by King Joseph and Marshal Jourdan, at Vittoria (June 21, 1813). The king fled from Spain, was disgraced by Napoleon, and received the order to retire incognito to Mortfontaine. The emperor wrote to the minister of war (July 11, 1813):—“His [Joseph’s] behaviour has never ceased bringing misfortune upon my army; it is time to make an end of it.”

Napoleon was equally dissatisfied with his brother’s conduct as lieutenant-general of France, while he himself was conducting the campaign of 1814 in the east of France. On the 30th of March, Joseph empowered Marmont to make a truce with the assailants of Paris if they should be in overpowering strength. On the surrender of the capital Joseph at once retired. The part which he played during the Hundred Days (1815) was also insignificant. It is strange that, four days after Waterloo, Napoleon should have urged him to inspirit the Chamber of Deputies with a view to a national resistance (*Lettres nouvelles de Napoléon*). In point of fact Joseph did little beyond seeking to further the emperor’s plans of escape to America. After the surrender of his brother to the captain of H.M.S. “Bellerophon” at Rochefort, Joseph went to the United States. Settling in Bordentown, New Jersey, he adopted the title of comte de Survilliers, and sought to promote plans for the rescue of his brother from St Helena. In 1830 he pleaded, but unsuccessfully, for the recognition of the claims of the duke of Reichstadt (king of Rome) to the French throne. He afterwards visited England, and for a time resided at Genoa and Florence. In the latter city, the cradle of his race, he died on the 28th of July 1844. In person he somewhat resembled Napoleon, but utterly lacked his strength and energy. He was fitted for an embassy or judgeship, but was too mild, supine and luxurious for the tasks thrust upon him by his brother. Yet his correspondence and memoirs prove that he retained for Napoleon warm feelings of affection.

Of the many works dealing with Joseph Bonaparte we may cite Baron A. du Casse, *Mémoires et correspondance politique et militaire du roi Joseph* (10 vols., Paris, 1854), and *Les Rois frères de Napoléon* (1883); J.S.C. Abbott, *History of Joseph Bonaparte* (New York, 1869); G. Bertin, *Joseph Bonaparte in America*; *Joseph Bonaparte jugé par ses contemporains* (anon.); the *Memoirs of Count Miot de Melito* (translation, edited by General Fleischmann, 2 vols., 1881); R.M. Johnston, *The Napoleonic Empire in Southern Italy* (2 vols., with an excellent bibliography, London, 1904); *Correspondence of Napoleon with Joseph Bonaparte* (2 vols., New York, 1856); Baron A. du Casse, *Histoire des ... traités de Mortfontaine, de Lunéville et d’Amiens*, &c. (1855-1857); F. Masson, *Napoléon et sa famille* (4 vols., Paris, 1889-1900).

2. Lucien Bonaparte

II. Lucien (1775-1840), prince of Canino, was born at Ajaccio on the 21st of May 1775. He followed his elder brothers to the schools of Autun and Brienne. At that time he wished to enter the French army, but, being debarred by defective sight, was destined for the church, and with this aim in view went to the seminary at Aix in Provence (1786). His excitable and volatile disposition agreed ill with the discipline of the place, and on the outbreak of the Revolution in 1789 he eagerly espoused the democratic and anti-clerical movement then sweeping over France. On returning to Corsica he

became the leading speaker in the Jacobin club at Ajaccio. Pushing even Napoleon to more decided action, Lucien urged his brothers to break with Paoli, the leader of the more conservative party, which sought to ally itself with England as against the regicide republic of France. He headed a Corsican deputation which went to France in order to denounce Paoli and to solicit aid for the democrats; but, on the Paolists gaining the upper hand, the Bonapartes left the island and joined Lucien at Toulon. In the south of France he worked hard for the Jacobinical cause, and figured as "Brutus" in the Jacobin club of the small town of St Maximin (then renamed Marathon). There on the 4th of May 1794 he married Mlle Catherine Boyer, though he was a minor and had not the consent of his family—an act which brought him into a state almost approaching disgrace and penury. The *coup d'état* of Thermidor (July 28, 1794) compelled the young disciple of Robespierre hurriedly to leave St Maximin, and to accept a small post at St Chamans. There he was arrested and imprisoned for a time until Napoleon's influence procured his release, and further gained for him a post as commissioner in the French army campaigning in Germany. Lucien soon conceived a dislike for a duty which opened up no vista for his powers of oratory and political intrigue, and repaired to Corsica. In the hope of being elected a deputy of the island, he refused an appointment offered by Napoleon in the army of Egypt in 1798. His hopes were fulfilled, and in 1798 he entered the Council of Five Hundred at Paris. There his vivacious eloquence brought him into prominence, and he was president of that body on the eventful day of the 19th of Brumaire (November 10) 1799, when Napoleon overthrew the national councils of France at the palace of St Cloud. The refusal of Lucien to put the vote of outlawry, for which the majority of the council clamoured, his opportune closing of the sitting, and his appeal to the soldiers outside to disperse *les représentants du poignard*, turned the scale in favour of his brother.

By a strange irony this event, the chief event of Lucien's life, was fatal to the cause of democracy of which he had been the most eager exponent. In one of his earlier letters to his brother Joseph, Lucien stated that he had detected in Napoleon "an ambition not altogether egotistic but which surpassed his love for the general weal; ... in case of a counter-revolution he would try to ride on the crest of events." Napoleon having by his help triumphed over parliamentary institutions in France, Lucien's suspicion of his brother became a dominant feeling; and the relations between them became strained during the period of the consulate (1799-1804). He accepted office as minister of the interior, but was soon deprived of it owing to political and personal differences with the First Consul. In order to soften the blow, Napoleon appointed him ambassador to the court of Madrid (November 1800). There again Lucien displeased his brother. France and Spain were then about to partition Portugal, and the Spanish forces were beginning to invade that land, when the court of Lisbon succeeded, owing (it is said) to the free use of bribes, in inducing Godoy, the Spanish minister, and Lucien Bonaparte to sign the preliminaries of peace on the 6th of June 1801 at Badajoz. The First Consul, finding his plans of seizing Lisbon frustrated, remonstrated with his brother, who thereupon resigned his post, and returned to Paris, there taking part in the opposition which the Tribunate offered to some of Napoleon's schemes. Lucien's next proceeding completed the breach between the two brothers. His wife had died in 1800; he became enamoured of a Mme Jouberthou in the early summer of 1802, made her his mistress, and finally, despite the express prohibition of the First Consul, secretly married her at his residence of Plessis (on October 23, 1803). At that time Napoleon was pressing Lucien for important reasons of state to marry the widow of the king of Etruria, and on hearing of his brother's action he ordered him to leave French territory. Lucien departed for Italy with his wife and infant son, after annoying Napoleon by bestowing on her publicly the name of Bonaparte. He also charged Joseph never to try to reconcile Napoleon to him.

For some years he lived in Italy, chiefly at Rome, showing marked hostility to the emperor. In December 1807 the latter sought to come to an arrangement by which Lucien would take his place as a French prince, provided that he would annul his marriage. This step Lucien refused to take; and after residing for some time at his estate of Canino, from which he took the papal title of prince of Canino, he left for America. Captured by a British ship, he was taken to Malta and thence to England, where he resided under some measure of surveillance up to the peace of 1814. Returning to Rome, he offered Napoleon his help during the Hundred Days (1815), stood by his side at the "Champ de Mai" at Paris, and was the last to defend his prerogatives at the time of his second abdication. He spent the rest of his life in Italy, and died at Rome on the 29th of June 1840. His family comprised four sons and six daughters. He wrote an epic, *Charlemagne, ou l'Église délivreé* (2 vols., 1814), also *La Vérité sur les Cent Jours* and *Memoirs*, which were not completed.

For sources see T. Jung, *Lucien Bonaparte et ses mémoires* (3 vols., Paris, 1882-1883); an anonymous work, *Le Prince Lucien Bonaparte et sa famille* (Paris, 1888); F. Masson, *Napoléon et sa famille* (4 vols., Paris, 1897-1900), and H. Houssaye, *"1815"* (3 vols., Paris, 1899-1905).

3. Elisa.

III. Marianne Elisa (1777-1820) was born at Ajaccio on the 3rd of January 1777. Owing to the efforts of her brothers she entered the establishment of St Cyr near Paris as a "king's scholar." On its disruption by the revolutionists in 1792 Napoleon took charge of her and brought her back to Ajaccio. She shared the fortunes of the family in the south of France, and on the 5th of May 1797 married Felix Bacciochi, a well-connected Corsican. In 1805, after the foundation of the French empire, Napoleon bestowed upon her the principality of Piombino and shortly afterwards Lucca; in 1808 her importunities gained for her the grand duchy of Tuscany. Bacciochi being almost a nullity, her pride and ability had a great influence on the administration and on Italian affairs in general. Her relations with Napoleon were frequently strained; and in 1813-1814 she abetted Murat in his enterprises (see Murat). After her brother's fall she retired, with the title of countess of Compignano, first to Bologna and afterwards to Santo Andrea near Trieste, where she died on the 6th of August 1820.

See J. Turquan, *Les Sœurs de Napoléon* (Paris, 1896); P. Marmothan, *Élisa Bonaparte* (Paris, 1898); E. Rodocanachi, *Élisa Bonaparte en Italie* (Paris, 1900); F. Masson, *Napoléon et sa famille* (4 vols., Paris, 1897-1900).

4. Louis Bonaparte.

IV. Louis (1778-1846) was born at Ajaccio on the 2nd of September 1778. His elder brother Napoleon supervised his education with much care, gaining for him scholarships to the royal military schools of France, and during the time when the elder brother was a lieutenant in garrison at Auxonne Louis shared his scanty fare. In 1795 Napoleon procured for him admission to the military school at Châlons, and wrote thus of the boy:—"I am very pleased with Louis; he fulfils my hopes; intelligence, warmth, good health, talent, good address, kindness—he possesses all these qualities." Louis went through the Italian campaign of 1796-97 with Napoleon and acted as his aide-de-camp in

Egypt in 1798-99. In 1802 the First Consul married him to Hortense Beauharnais, a forced union which led to most deplorable results. In 1804 Louis was raised to the rank of general, and entered the council of state in order to perfect his knowledge of administrative affairs. In the next year he became governor of Paris and undertook various military and administrative duties.

After the victory of Austerlitz (December 2, 1805) Napoleon began to plan the formation of a ring of states surrounding, and in close alliance with, the French empire. He destined Louis for the throne of Holland, and proclaimed him king of that country on the 6th of June 1806. From the first the emperor reproached him with being too easy with his subjects and with courting popularity too much. The increasing rigour of the continental system brought the two brothers to an open rupture. Their relations were embittered by a violent jealousy which Louis conceived against his wife. In 1808 the emperor offered Louis the throne of Spain then vacant; but on Louis refusing to accept it the honour went to Joseph. The dispute between Louis and the emperor continued. In the latter part of 1809 Napoleon virtually resolved to annex Holland, in order to stop the trade which the Dutch secretly carried on with England. At the close of the year Louis went to Paris, partly in order to procure a divorce from Hortense and partly to gain better terms for Holland. He failed in both respects. In January 1810 Napoleon annexed the island of Walcheren, alleging that Louis had not done his share in defending the interests of France at the time of the British Walcheren expedition (1809). The French troops also occupied Breda and Bergen-op-Zoom. Louis gave way on all the points in dispute; but his acquiescence only postponed the crisis. After the collapse of negotiations with Great Britain in the spring of 1810, the emperor again pressed Louis hard, and finally sent French troops against the Dutch capital. Thereupon Louis, despairing of offering resistance, fled from his kingdom and finally settled at Töplitz in Bohemia. On the 9th of July 1810 Napoleon annexed Holland to the French empire. Louis spent the rest of his life separated from his wife, and in 1815 gained the custody of his elder son. He lived chiefly at Rome, concerning himself with literary and philosophic studies and with the fortunes of his sons. Their devotion to the national and democratic cause in Italy in 1830-1831 gave him much pleasure, which was overclouded by the death of the elder, Napoleon Louis, in the spring campaign of 1831 in the Romagna. The failure of his other son, Charles Louis Napoleon (afterwards Napoleon III.), to wrest the French crown from Louis Philippe by the attempts at Strassburg and Boulogne also caused him much disappointment. He died on the 25th of July 1846 and was buried at St Leu. Under more favourable conditions Louis would have gained a name for kindness and philanthropy, proofs of which did indeed appear during his reign in Holland and gained him the esteem of his subjects; but his morbid sensitiveness served to embitter his relations both of a domestic and of a political nature and to sour his own disposition. His literary works are unimportant. His sons were Napoleon Charles (1802-1807), Napoleon Louis (1804-1831), and Charles Louis Napoleon (1808-1873), afterwards emperor of the French as Napoleon III. (*q.v.*).

The chief works on the life and reign of Louis are le comte de Saint-Leu, *Documents historiques et reflexions sur le gouvernement de Hollande* 3 vols., 2nd ed., Paris, 1820); F. Rocquain, *Napoleon I^er^ et le Roi Louis, d'après les documents conservés aux archives nationales* (Paris, 1875); Baron A. du Casse, *Les Rois frères de Napoléon* (Paris, 1883); A Garnier, *La Cour de Hollande sous le règne de Louis Bonaparte, par un auditeur* (Paris and Amsterdam, 1823); T. Jorissen, *Napoléon 1'er et le roi de Hollande (1806-1813) d'après des documents authentiques et inedits* (Paris and The Hague, 1868); V. Loosjes, *Louis Bonaparte, Koning van Holland* (Amsterdam, 1888); L. Wichers, *De Regeering van Koning Lodewijk Napoleon* (1806-1810) (Utrecht, 1892); F. Masson, *Napoléon et sa famille* (4 vols., Paris, 1897-1900).

5. Pauline.

V. Marie Pauline (1780-1825), the gayest and most beautiful member of the family, was born at Ajaccio on the 20th October 1780. At seventeen years of age she married General Leclerc, a staff officer of Napoleon, and accompanied him to St Domingo, where he died of yellow fever in 1802. Returning to Paris she espoused Prince Camillo Borghese (August 23, 1803) and went to reside with him in Rome. She soon tired of him, returned to Paris and gratified her whims in ways that caused some scandal. In 1806 she received the title of duchess of Guastalla. Her offhand treatment of the new empress, Marie Louise, in 1810 led to her removal from court. Nevertheless in 1814 she repaired with "Madame Mère" to Elba, and is said to have expressed a wish to share Napoleon's exile in St Helena. She died in 1825 of cancer. Canova's statue of her as Venus reclining on a couch is well known.

See J. Turquan, *Les Sœurs de Napoléon: les princesses Élisa, Pauline et Caroline* (Paris, 1896); F. Masson, *Napoléon et sa famille* (4 vols., Paris, 1897-1900).

6. Caroline Murat.

VI. Maria Annunciata Caroline (1782-1839) was born at Ajaccio on the 25th of March 1782. Early in 1800 she married Joachim Murat, whose interests she afterwards advanced with all the power of her ambitious and intriguing nature. He became governor of Paris, marshal of France (1804), grand duke of Berg and of Cleves (1806), lieutenant of the emperor in Spain (1808), and early in the summer of that year king of Naples. The distance of this capital from Paris displeased Caroline; her relations with Napoleon became strained, and she associated herself with the equivocal movements of her husband in 1814-1815. Before his tragic end at Pizzo on the 13th of October 1815, she had retired to Austrian territory and was placed under some measure of restraint. Finally she lived at Trieste with her sister Elisa. She died on the 18th of May 1839.

See J. Turquan, *Caroline Murat, reine de Naples* (Paris, 1899); F. Masson, *Napoléon et sa famille* (4 vols., Paris, 1897-1900). See also under Murat, Joachim.

7. Jerome Bonaparte.

VII. Jerome (1784-1860) was born at Ajaccio on the 15th of November 1784; he shared the fortunes of the family in the early years of the French Revolution, was then educated at Juilly and was called to the side of his brother, then First Consul of France, in 1800. Many stories are told illustrating his impetuous but affectionate nature. While in the Consular Guard he fought a duel with the younger brother of General Davout and was wounded. Soon afterwards he was transferred to the navy and cruised in the West Indies, until, when blockaded by a British cruiser, he left his ship and travelled through the United States. At Baltimore he fell in love with Miss Elizabeth Patterson, and, though a minor, married her. This disregard of discipline and of the laws of France greatly annoyed Napoleon; and when in 1805 Jerome brought his wife to Europe, the emperor ordered her to be excluded from his states. Jerome vainly sought to bend his brother's will in an interview at Alexandria. In May 1805 he received command of a small squadron in the Mediterranean, while his wife proceeded to Camberwell, where she gave birth to a son. In November Jerome sailed in a squadron commanded by Admiral Willaumez, which was to ravage the West Indies; but it was scattered by a storm. After damaging British commerce in the North Atlantic, Jerome reached

France with his ship in safety in August 1806. Napoleon made him a prince of France, and gave him command of a division of South Germans in the campaign of 1806. After Jena, Jerome received the surrender of several Prussian towns. An imperial decree having annulled the Patterson marriage, the emperor united Jerome to the princess Catherine of Württemberg; and in pursuance of the terms of the treaty of Tilsit (July 7, 1807) raised him to the throne of the new kingdom of Westphalia. There Jerome, though frequently rebuked by the emperor, displayed his fondness for luxury, indulged in numerous *amours* and ran deeply into debt. In some respects his kingdom benefited by the connexion with France. Feudalism was abolished; the *Code Napoléon* was introduced; the Jews were freed from repressive laws; and education received some impulse in its higher departments. But the unpopularity of Jerome's rule was shown by the part taken by the peasants in the abortive rising headed by Baron Wilhelm von Dörnberg and other Westphalian officers in April 1809. Despite heavy taxation, the state debt increased greatly; and the sending of a contingent to Russia in 1812 brought the state to the verge of bankruptcy. In the early part of that campaign Jerome was entrusted with an important movement which might have brought the southern Russian army into grave danger; on his failure (which was probably due to his lack of energy) the emperor promptly subjected him to the control of Marshal Davout, and Jerome returned to Cassel. In 1813, on the fall of the Napoleonic régime in Germany, Jerome retired to France, and in 1814 spent some time in Switzerland and at Trieste. Returning to France in 1815, he commanded a division on the French left wing at Waterloo and attacked Hougomont with great pertinacity. On Napoleon's second abdication Jerome proceeded to Württemberg, was threatened with arrest unless he gave up his wife and child, and was kept under surveillance at Goppingen; finally he was allowed to proceed to Augsburg, and thereafter resided at Trieste, or in Italy or Switzerland. His consort died in 1835. He returned to France in 1847, and after the rise of Louis Napoleon to power, became successively governor of the Invalides, marshal of France and president of the senate. He died on the 24th of June 1860. His children were Jerome Napoleon (see XIV.), Mathilde (see XII.) and Napoleon Joseph Charles Paul (born in 1822); the last was afterwards known as Prince Napoleon (see XI. below) and finally became the heir to the fortunes of the Napoleonic dynasty.

The chief works relating to Jerome Bonaparte are: Baron Albert du Casse, *Mémoires et correspondance du roi Jérôme et de la reine Cathérine* (7 vols., Paris, 1861-1866) and *Les Rois frères de Napoléon* (1883); M.M. Kaisenberg, *Konig Jerome Napoleon*; W.T.R. Saffell, *The Bonaparte-Patterson Marriage*; August von Schlossberger, *Briefwechsel der Konigin Katharina und des Konigs Jerome von Westfalen mit Konig Friedrich von Württemberg* (Stuttgart, 1886-1887), supplemented by du Casse in *Corresp. inédite de la reine Cathérine de Westphalie* (Paris, 1888-1893); A. Martinet, *Jérôme Napoléon, roi de Westfalie* (Paris, 1902); P.W. Sergeant, *The Burlesque Napoleon* (1905); F. Masson, *Napoléon et sa famille* (4 vols., Paris, 1897-1900).

(J. Hl. R.)

The fortunes of the Bonaparte family may be further followed under the later biographies of its leading members, mainly descendants of Lucien (II. above) and Jerome (VII. above).

Descendants of Lucien: 8. Charles.

VIII. Charles Lucien Jules Laurent (1803-1857), prince of Canino, son of Lucien Bonaparte, was a scientist rather than a politician. He married his cousin, Zénaïde Bonaparte, daughter of Joseph, in 1822. At the age of twenty-two he began the publication of an *American Ornithology* (4 vols., Philadelphia, 1825-1833), which established his scientific reputation. A series of other works in zoology followed: *Iconographia della fauna Italica* (3 vols., Rome, 1832-1841), *Catalogo metodico degli uccelli europei* (1 vol., Bologna, 1842), *Catalogo metodico dei pesci europei* (1 vol., Naples, 1845, 4to), *Catalogo metodico dei mammiferi europei* (1 vol., Milan, 1845), *Telachorum tabula analytica* (Neufchatel, 1838). He was elected honorary member of the academy of Upsala in 1833, of that of Berlin in 1843, and correspondent of the Institute of France in 1844. Towards 1847 he took part in the political agitation in Italy, and presided over scientific congresses, notably at Venice, where he declared himself in favour of the independence of Italy and the expulsion of the Austrians. He entered the Junto of Rome in 1848 and was elected deputy by Viterbo to the national assembly. The failure of the revolution forced him to leave Italy in July 1849. He gained Holland, then France, where he turned again to science. His principal works were, *Conspectus systematis ornithologiae, mastozologiae, erpetologiae et amphibologiae, Ichthyologiae* (Leiden, 1850), *Tableau des oiseaux-mouches* (Paris, 1854), *Ornithologie fossile* (Paris, 1858). Eight children survived him: Joseph Lucien Charles Napoleon, prince of Canino (1824-1865), who died without heirs; Lucien Louis Joseph Napoleon, born in 1828, who took holy orders in 1853 and became a cardinal in 1868; Julie Charlotte Zénaïde Pauline Laetitia Désirée Bartholomée, who married the marquis of Roccagiovine; Charlotte Honorine Josephine, who married Count Primoli; Marie Désirée Eugénie Josephine Philomène, who married the count Campello; Auguste Amélie Maximilienne Jacqueline, who married Count Gabrielli; Napoleon Charles Grégoire Jacques Philippe, born in 1839, who married the princess Ruspoli, by whom he had two daughters; and Bathilde Aloyse Léonie, who married the comte de Cambacérès. The branch is now extinct.

9. Louis Lucien.

IX. Louis Lucien (1813-1891), son of Lucien Bonaparte, was born at Thorngrove, Worcestershire, England, on the 4th of January 1813. He passed his youth in England, not going to France until 1848, when, after the revolution, he was elected deputy for Corsica on the 28th of November 1848; his election having been invalidated, he was returned as deputy for the Seine in June 1849. He sat in the right of the Legislative Assembly, but had no direct part in the *coup d'état* of his cousin on the 2nd of December 1851. Napoleon III. named him senator and prince, but he took hardly any part in politics during the Second Empire, and after the proclamation of the Third Republic in 1870 he withdrew to England. There he busied himself with philology, and published notably some works on the Basque language: *Grammaire basque, Remarques sur plusieurs assertions concernant la langue basque* (1876), *Observations sur le basque Fontarabie* (1878). He died on the 3rd of November 1891, leaving no children.

10. Pierre.

X. Pierre Napoleon (1815-1881), son of Lucien Bonaparte, was born at Rome on the 12th of September 1815. He began his life of adventure at the age of fifteen, joining the insurrectionary bands in the Romagna (1830-1831); was then in the United States, where he went to join his uncle Joseph, and in Colombia with General Santander (1832). Returning to Rome he was taken prisoner by order of the pope (1835-1836). He finally took refuge in England. At the revolution of 1848 he returned to France and was elected deputy for Corsica to the Constituent Assembly. He declared himself an out-and-out republican and voted even with the socialists. He pronounced himself in favour of the national workshops and against the *loi Falloux*. His attitude contributed greatly to give popular confidence to his cousin Louis Napoleon (Napoleon III.), of whose *coup d'état* on the 2nd of December 1851 he disapproved; but he was soon reconciled to the emperor, and accepted the title of prince. The republicans at once abandoned him. From that time on he led a

debauched life, and lost all political importance. He turned to literature and published some mediocre poems. In January 1870 a violent incident brought him again into prominence. As the result of a controversy with Paschal Grousset, the latter sent him two journalists to provoke him to a duel. Pierre Bonaparte took them personally to account, and during a violent discussion he drew his revolver and killed one of them, Victor Noir. This crime greatly excited the republican press, which demanded his trial. The High Court acquitted him, and criticism then fell upon the government. Pierre Bonaparte died in obscurity at Versailles on the 7th of April 1881. He had married the daughter of a Paris working-man, Justine Eleanore Ruffin, by whom he had, before his marriage, two children: (1) Roland Napoleon, born on the 19th of May 1858, who entered the army, was excluded from it in 1886, and then devoted himself to geography and scientific explorations; (2) Jeanne, wife of the marquis de Vence.

Descendants of Jerome: 11. Prince Napoleon (Plon-Plon).

XI. Napoleon Joseph Charles Paul, commonly known as Prince Napoleon, or by the sobriquet of "Plon-Plon,"[1] (1822-1891), was the second son of Jerome Bonaparte, king of Westphalia, by his wife Catherine, princess of Württemberg, and was born at Trieste on the 9th of September 1822. He soon rendered himself popular by his advanced democratic ideas, which he expressed on all possible occasions. After the French revolution of 1848 he was elected to the National Assembly as a representative of Corsica, and (his elder brother, Jerome Napoleon Charles, dying in 1847) assumed the name of Jerome. Notwithstanding his ostensible opposition to the *coup d'état* of 1851, he was designated, upon the establishment of the Empire, as successor to the throne if Napoleon III. should die childless, and received a liberal dotation, but was allowed no share in public affairs. Privately he professed himself the representative of the Napoleonic tradition in its democratic aspect, and associated mainly with men of advanced political opinions. At court he represented the Liberal party against the empress Eugénie. In 1854 he took part in the Crimean campaign as general of division. His conduct at the battle of the Alma occasioned imputations upon his personal courage, but they seem to have been entirely groundless. Returning to France he undertook the chief direction of the National Exhibition of 1855, in which he manifested great capacity. In 1858 he was appointed minister for the Colonies and Algeria, and his administration aroused great hopes, but his activity was diverted into a different channel by his sudden marriage in January 1859 with the princess Marie Clotilde of Savoy, daughter of Victor Emmanuel, a prelude to the war for the liberation of Italy. In this war Prince Napoleon commanded the French corps that occupied Tuscany, and it was expected that he would become ruler of the principality, but he refused to exert any pressure upon the inhabitants, who preferred union with the Italian kingdom. The next few years were chiefly distinguished by remarkable speeches which displayed the prince in the unexpected character of a great orator. Unfortunately his indiscretion equalled his eloquence: one speech (1861) sent him to America to avoid a duel with the duke d'Aumale; another (1865), in which he justly but intemperately protested against the Mexican expedition, cost him all his official dignities. Nevertheless he was influential in effecting the reform by which in 1869 it was sought to reconcile the Empire with Liberal principles. The fatal war of 1870 was resolved upon during his absence in Norway, and was strongly condemned by him. After the first disasters he undertook an ineffectual mission to Italy to implore the aid of his father-in-law; and after the fall of the Empire lived in comparative retirement until in 1879 the death of Napoleon III.'s son, the Prince Imperial (see XIII. below), made him direct heir to the Napoleonic succession. His part as imperial pretender was unfortunate and inglorious: his democratic opinions were unacceptable to the imperial party, and before his death he was virtually deposed in favour of his son Prince Napoleon Victor, who, supported by Paul de Cassagnac and others, openly declared himself a candidate for the throne in 1884. He died at Rome on the 17th of March 1891. In the character of his intellect, as in personal appearance, he bore an extraordinary resemblance to the first Napoleon, possessing the same marvellous lucidity of insight, and the same gift of infallibly distinguishing the essential from the non-essential. He was a warm friend of literature and art, and in a private station would have achieved high distinction as a man of letters.

His eldest son, Prince Napoleon Victor Jérome Frédéric (b. 1862), became at his death the recognized head of the French Bonapartist party. The second son, Prince Louis Napoleon, an officer in the Russian army, showed a steadier disposition, and was more favoured in some monarchist quarters; in 1906 he was made governor of the Caucasus.

12. Mathilde.

XII. Mathilde Letitia Wilhelmine (1820-1904), daughter of Jerome, and sister of Prince Napoleon (XI.), was born at Trieste on the 20th of May 1820; after being almost betrothed to her cousin Louis Napoleon, in 1840 she was married to Prince Anatole Demidov. His conduct, however, led to a separation within five years, and the tsar Nicholas compelled him to make Princess Mathilde a handsome allowance. After the election of Louis Napoleon to the presidency of the republic she took up her residence in Paris, and did the honours of the Élysée till his marriage. She continued to live in Paris, having great influence as a friend and patron of men of art and letters, till her death on the 2nd of January 1904.

13. Prince Imperial: son of Napoleon III.

XIII. Napoleon Eugene Louis Jean Joseph (1856-1879), Prince Imperial, only son of the emperor Napoleon III. and the empress Eugénie, was born at Paris on the 16th of March 1856. He was a delicate boy, but when the war of 1870 broke out his mother sent him to the army, to win popularity for him, and the government journals vaunted his bravery. After the first defeats he had to flee from France with the empress, and settled in England at Chislehurst, completing his military education at Woolwich. On the death of his father on the 9th of January 1873 the Imperialists proclaimed him Napoleon IV., and he became the official Pretender. He was naturally inactive, but he was influenced by his mother on the one hand, and by the Bonapartist leaders in France on the other. They thought that he should win his crown by military prestige, and he was persuaded to attach himself as a volunteer to the English expedition to Zululand in February 1879. It was a blunder to have allowed him to go, and the blunder ended in a tragedy, for while out on a reconnaissance with a few troopers they were surprised by Zulus, and the Prince Imperial was killed (June 1, 1879). His body was brought back to England, and buried at Chislehurst.

XIV. The Bonapartes of Baltimore are a branch of the family settled in America, descended from Jerome Bonaparte (VII.) by his union with Elizabeth (b. 1785), daughter of William Patterson, a Baltimore merchant, probably descended from the Robert Paterson who was the original of Sir Walter Scott's "Old Mortality." The marriage took place at Baltimore on the 24th of December 1803, but it was greatly disliked by Napoleon, who refused to recognize its legality. However, it was valid according to American law, and Pope Pius VII. refused to

declare it void. Nevertheless Jerome was forced by his brother to separate himself from his wife, whom he had brought to Europe, and after a stay in England Madame Patterson, or Madame Bonaparte, as she was usually called, returned to Baltimore. She died in 1879. Jerome's only child by this marriage was Jerome Napoleon Bonaparte (1805-1870), who was born in England, but resided chiefly in Baltimore, and is said to have shown a marked resemblance to his uncle, the great emperor. He was on good terms with Jerome, who for some time made him a large allowance, and father and son occasionally met. His elder son, also called Jerome Napoleon Bonaparte (1832-1893), entered the French army, with which he served in the Crimea and in Italy.

Charles Joseph Bonaparte (b. 1851), younger son of the first Jerome Napoleon Bonaparte, and a grandson of Jerome, king of Westphalia, attained a distinguished place in American politics. Born at Baltimore on the 9th of June 1851 and educated at Harvard University, he became a lawyer in 1874 and has been president of the National Municipal League and has filled other public positions. He was secretary of the navy in President Roosevelt's cabinet from July 1905 to December 1906, and then attorney-general of the United States until March 1909.

1 Derived, it is supposed, from the nickname "Plomb-plomb," or "Craint-plomb" (fear-lead), given him by his soldiers in the Crimea.

BONAR, HORATIUS (1808-1889), Scottish Presbyterian divine, was born in Edinburgh on the 19th of December 1808, and educated at the high school and university of his native city. After a term of mission work at Leith, he was appointed parish minister of Kelso in 1837, and at the Disruption of 1843 became minister of the newly formed Free Church, where he remained till 1866, when he went to the Chalmers memorial church, Edinburgh. He had in 1853 received the D.D. degree from Aberdeen University, and in 1883 he was moderator of the general assembly of his church. He died on the 31st of July 1889. Bonar was a prolific writer of religious literature, and edited several journals, including the *Christian Treasury*, the *Presbyterian Review* and the *Quarterly Journal of Prophecy*; but his best work was done in hymnology, and he published three series of *Hymns of Faith and Hope* between 1857 and 1866 (new ed., 1886). Nearly every modern hymnal contains perhaps a score of his hymns, including "Go, labour on," "I heard the voice of Jesus say," "Here, O my Lord, I see Thee face to face," "When the weary, seeking rest."

See *Horatius Bonar, D.D., a Memorial* (1889).

BONAVENTURA, SAINT (John of Fidanza), Franciscan theologian, was born in 1221 at Bagnarea in Tuscany. He was destined by his mother for the church, and is said to have received his cognomen of Bonaventura from St Francis of Assisi, who performed on him a miraculous cure. He entered the Franciscan order in 1243, and studied at Paris possibly under Alexander of Hales, and certainly under Alexander's successor, John of Rochelle, to whose chair he succeeded in 1253. Three years earlier his fame had gained for him permission to read upon the *Sentences*, and in 1255 he received the degree of doctor. So high was his reputation that in the following year he was elected general of his order. It was by his orders that Roger Bacon was interdicted from lecturing at Oxford, and compelled to put himself under the surveillance of the order at Paris. He was instrumental in procuring the election of Gregory X., who rewarded him with the titles of cardinal and bishop of Albano, and insisted on his presence at the great council of Lyons in the year 1274. At this meeting he died.

Bonaventura's character seems not unworthy of the eulogistic title, "Doctor Seraphicus," bestowed on him by his contemporaries, and of the place assigned to him by Dante in his *Paradiso*. He was formally canonized in 198
1482 by Sixtus IV., and ranked as sixth among the great doctors of the church by Sixtus V. in 1587. His works, as arranged in the Lyons edition (7 vols., folio), consist of expositions and sermons, filling the first three volumes; of a commentary on the *Sentences* of Lombardus, in two volumes, celebrated among medieval theologians as incomparably the best exposition of the third part; and of minor treatises filling the remaining two volumes, and including a life of St Francis. The smaller works are the most important, and of them the best are the famous *Itinerarium Mentis ad Deum, Breviloquium, De Reductione Artium ad Theologiam, Soliloquium*, and *De septem itineribus aeternitatis*, in which most of what is individual in his teaching is contained.

In philosophy Bonaventura presents a marked contrast to his great contemporaries, Thomas Aquinas and Roger Bacon. While these may be taken as representing respectively physical science yet in its infancy, and Aristotelian scholasticism in its most perfect form, he brings before us the mystical and Platonizing mode of speculation which had already to some extent found expression in Hugo and Richard of St Victor, and in Bernard of Clairvaux. To him the purely intellectual element, though never absent, is of inferior interest when compared with the living power of the affections or the heart. He rejects the authority of Aristotle, to whose influence he ascribes much of the heretical tendency of the age, and some of whose cardinal doctrines—such as the eternity of the world—he combats vigorously. But the Platonism he received was Plato as understood by St Augustine, and as he had been handed down by the Alexandrian school and the author of the mystical works passing under the name of Dionysius the Areopagite. Bonaventura accepts as Platonic the theory that ideas do not exist *in rerum natura*, but as thoughts of the divine mind, according to which actual things were formed; and this conception has no slight influence upon his philosophy. Like all the great scholastic doctors he starts with the discussion of the relations between reason and faith. All the sciences are but the handmaids of theology; reason can discover some of the moral truths which form the groundwork of the Christian system, but others it can only receive and apprehend through divine illumination. In order to obtain this illumination the soul must employ the proper means, which are prayer, the exercise of the virtues, whereby it is rendered fit to

accept the divine light, and meditation which may rise even to ecstatic union with God. The supreme end of life is such union, union in contemplation or intellect and in intense absorbing love; but it cannot be entirely reached in this life, and remains as a hope for futurity. The mind in contemplating God has three distinct aspects, stages or grades—the senses, giving empirical knowledge of what is without and discerning the traces (*vestigia*) of the divine in the world; the reason, which examines the soul itself, the image of the divine Being; and lastly, pure intellect (*intelligentia*), which, in a transcendent act, grasps the Being of the divine cause. To these three correspond the three kinds of theology—*theologia symbolica, theologia propria* and *theologia mystica*. Each stage is subdivided, for in contemplating the outer world we may use the senses or the imagination; we may rise to a knowledge of God *per vestigia* or *in vestigiis*. In the first case the three great properties of physical bodies—weight, number, measure,—in the second the division of created things into the classes of those that have merely physical existence, those that have life, and those that have thought, irresistibly lead us to conclude the power, wisdom and goodness of the Triune God. So in the second stage we may ascend to the knowledge of God, *per imaginem*, by reason, or *in imagine*, by the pure understanding (*intellectus*); in the one case the triple division—memory, understanding and will,—in the other the Christian virtues—faith, hope and charity,—leading again to the conception of a Trinity of divine qualities—eternity, truth and goodness. In the last stage we have first *intelligentia*, pure intellect, contemplating the essential being of God, and finding itself compelled by necessity of thought to hold absolute being as the first notion, for non-being cannot be conceived apart from being, of which it is but the privation. To this notion of absolute being, which is perfect and the greatest of all, objective existence must be ascribed. In its last and highest form of activity the mind rests in the contemplation of the infinite goodness of God, which is apprehended by means of the highest faculty, the *apex mentis* or *synderesis*. This spark of the divine illumination is common to all forms of mysticism, but Bonaventura adds to it peculiarly Christian elements. The complete yielding up of mind and heart to God is unattainable without divine grace, and nothing renders us so fit to receive this gift as the meditative and ascetic life of the cloister. The monastic life is the best means of grace.

Bonaventura, however, is not merely a meditative thinker, whose works may form good manuals of devotion; he is a dogmatic theologian of high rank, and on all the disputed questions of scholastic thought, such as universals, matter, the principle of individualism, or the *intellectus agens*, he gives weighty and well-reasoned decisions. He agrees with Albertus Magnus in regarding theology as a practical science; its truths, according to his view, are peculiarly adapted to influence the affections. He discusses very carefully the nature and meaning of the divine attributes; considers universals to be the ideal forms pre-existing in the divine mind according to which things were shaped; holds matter to be pure potentiality which receives individual being and determinateness from the formative power of God, acting according to the ideas; and finally maintains that the *intellectus agens* has no separate existence. On these and on many other points of scholastic philosophy the Seraphic Doctor exhibits a combination of subtilty and moderation which makes his works peculiarly valuable.

Editions.—7 vols., Rome, 1588-1596; 7 vols., Lyons, 1668; 13 vols., Venice, 1751 ff.; by A.C. Peltier, 15 vols., Paris, 1863 ff.; 10 vols., Rome, 1882-1892. K.J. Hefele edited the *Breviloquium* and the *Itin. Mentis* (3rd ed., Tübingen, 1862); two volumes of selections were issued by Alix in 1853-1856.

Literature.—W.A. Hollenberg, *Studien zu Bonaventura* (1862); F. Nitzsch, art. in Herzog-Hauck, *Realencyk. für prot. Theol.*, where a list of monographs is given, to which add one by De Chévancé (1899).

(R. Ad.; X.)

BONCHAMPS, CHARLES MELCHIOR ARTUS, Marquis de (*c.* 1760-1793), Vendéan leader, was born at Jouverteil, Anjou. He gained his first military experience in the American War of Independence, and on his return to France was made a captain of grenadiers in the French army. He was a staunch upholder of the monarchy, and at the outbreak of the French Revolution resigned his command and retired to his château at St Florent. In the spring of 1793 he was chosen leader by the insurgents of the Vendée, and to his counsels may be attributed in great measure the success of the peasants' arms. He was present at the taking of Bressuire, Thouars and Fontenay, at which last place he was wounded; but dissensions among their leaders weakened the insurgents, and at the bloody battle of Cholet (October 1793) the Vendéans sustained a severe defeat and Bonchamps was mortally wounded. He died the next day. It is said that his last act was the pardoning of five thousand republican prisoners, whom his troops had sworn to kill in revenge for his death. A statue of him by David d'Angers stands in the church of St Florent.

BOND, SIR EDWARD AUGUSTUS (1815-1898), English librarian, was born at Hanwell on the 31st of December 1815, the son of a schoolmaster. He was educated at Merchant Taylors' school, and in 1832 obtained a post in the public record office. In 1838 he became an assistant in the manuscript department of the British Museum, where he attracted the notice of his chief, Sir Frederick Madden, the most eminent palaeographer of his day, and in 1852 he was made Egerton librarian. In 1856 he became assistant keeper of MSS., and in 1867 was promoted to the post of keeper. His work in reorganizing the manuscript department was of lasting value, and to him is due the classified catalogue of MSS., and the improved efficiency and punctuality of publication of the department. In 1878 he was appointed principal librarian. Under his supervision were erected the new buildings of the "White Wing," which provide accommodation for prints, drawings, manuscripts and newspapers, and the purchase of the Stowe MSS. was concluded while he remained in office. He founded, in conjunction with Sir E. Maunde Thompson, the Palaeographical Society, and first made classical palaeography an exact science. He was made LL.D. of Cambridge in 1879, created C.B. in 1885, and K.C.B. the day before his death on the 2nd of January 1898. He was the editor of four volumes of facsimiles of Anglo-Saxon charters from 679 to the Conquest, *The Speeches in the Trial of Warren Hastings* (1859-1861), and a number of other

interesting historic documents.

BOND,[1] in English law, an obligation by deed. Its design is to secure that the obligor, *i.e.* the person giving the bond, will either pay a sum of money, or do or refrain from doing some act; and for this purpose the obligor binds himself in a penalty to the obligee, with a condition added that, if the obligor pays the sum secured—which is usually half the penalty—or does or refrains from doing the specified act, the bond shall be void: otherwise it shall remain in full force. This condition is known as the defeasance because it defeats or undoes the bond. The form of a common money bond runs as follows:—

> Know All Men by these presents that I, A.B. (name, address and description of obligor), am bound to C.D. (name, address and description of obligee) in the sum of £[2000] to be paid to the said (obligee), his executors, administrators or assigns or to his or their attorney or attorneys, for which payment I bind myself by these presents. Sealed with my seal. Dated this day of 19 .
>
> The condition of the above-written bond is such that if the above A.B., his heirs, executors or administrators, shall on the day of pay to the above-named C.D., his heirs, executors, administrators or assigns the sum of £[1000], with interest for the same from the date of the above-written bond at the rate of per cent per annum without any deduction, then the above-written bond shall be void: otherwise the bond shall remain in full force.
>
> Signed, sealed and delivered
> by the above-named A.B.
> in the presence of (witness)

Recitals are frequently added to explain the circumstances under which the bond is given.

If the condition is not performed, *i.e.* if the obligor does not pay the money by the day stipulated, or do or refrain from doing the act provided for, the bond becomes forfeit or absolute at law, and charges the obligor and his estate (see Conveyancing Act 1881, s. 59). In old days, when a bond was forfeit, the whole penalty was recoverable at law and payment *post diem* could not be pleaded to an action on it, but the court of chancery early interposed to prevent oppression. It held the penalty of a bond to be the form, not the substance of it, a pledge merely to secure repayment of the sum bona fide advanced, and would not permit a man to take more than in conscience he ought, *i.e.* in case of a common money bond, his principal, interest and expenses. This equitable relief received statutory recognition by an act of 1705, which provided that, in case of a common money bond, payment of the lesser sum with interest and costs shall be taken in full satisfaction of the bond. An obligee of a common money bond can, since the date of the Judicature Act, obtain summary judgment under O. xiv. (R.S.C. 1883) by specially endorsing his writ under O. iii. R. 6.

Bonds were, however, and still are given to secure performance of a variety of matters other than the payment of a sum of money at a fixed date. They may be given and are given, for instance, to guarantee the fidelity of a clerk, of a rent collector, or of a person in an office of public trust, or to secure that an intended husband will settle a sum on his wife in the event of her surviving him, or that a building contract shall be carried out, or that a rival business shall not be carried on by the obligor except within certain limits of time and space. The same object can often be attained—and more conveniently attained—by a covenant than by bond, and covenants have in the practice of conveyancers largely superseded bonds, but there are cases where security by bond is still preferable to security by covenant. Thus under a bond to secure an annuity, if the obligor makes default, judgment may be entered for the penalty and stand as security for the future payments without the necessity of bringing a fresh action for each payment. In cases of bonds with special conditions, such as those instanced above, the remedy of the obligee for breach of the condition is prescribed by an act of 1696, the procedure under which is preserved by the Judicature Act (O. xxii. R. 1, O. xiii. R. 14). The obligee assigns the particular breaches of which he complains, damages in respect of such breaches are assessed, and, on payment into court by the obligor of the amount of such damages, the court enters a stay of execution. A difficulty which has much exercised and still exercises the courts is to determine, in these cases of special conditions, whether the sum for which the bond is given is a true penalty or only liquidated damages. There is nothing to prevent the parties to a bond from agreeing the damages for a breach, and if they have done so, the court will not interfere, as it will in the case of a penalty. The leading case on the subject is *Kemble* v. *Farren* (1829; 6 Bing. 148).

Bonds given to secure the doing of anything which is contrary to the policy of the law are void. Such, for instance, is a bond given to a woman for future cohabitation (as distinguished from past cohabitation), or a marriage brocage bond, that is, a bond given to procure a marriage between parties. (See the matrimonial agency case, *Hermann* v. *Charlesworth*, 1905, 2 K.B. 123). It was not without design that Shakespeare laid the scene of Shylock’s suit on Antonio’s bond in a Venetian court; the bond would have had short shrift in an English court.

> *Post Obit Bonds.*—A post obit bond is one given by an expectant heir or legatee, payable on or after the death of the person from whom the obligor has expectations. Such a bond, if the obligee has exacted unconscionable terms, may be set aside.
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> *Bottomry Bonds.*—A bottomry bond is a contract of hypothecation by which the owner of a ship, or the master as his agent, borrows money for the use of the ship to meet some emergency, *e.g.* necessary repairs, and pledges the ship (or keel or bottom of the ship, *partem pro toto*) as security for repayment. If the ship safely accomplishes her voyage, the obligee gets his money back with the agreed interest: if the ship is totally lost, he loses it altogether.
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> *Lloyd’s Bonds.*—Lloyd’s bonds are instruments under the seal of a railway company, admitting the indebtedness of the company to the obligee to a specified amount for work done or goods supplied, with a covenant to pay him such amount with interest on a future day. They are a device by which railway companies were enabled to increase their indebtedness without technically violating their charter. The name is derived

from the counsel who settled the form of the bond.

Debenture Bonds.—Debenture bonds are bonds secured only by the covenant of the company without any floating or fixed charge on the assets. (See Debentures and Debenture Stock.)

Recognizance.—A recognizance differs from a bond in being entered into before a court of record and thereby becoming an obligation of record.

Heritable bond is a Scots law term, meaning a bond for money, joined with a conveyance of land, and held by a creditor as security for his debt.

For goods "in bond" see Bonded Warehouse.

(E. Ma.)

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1 This word, meaning "that which binds," is a phonetic variant of "band," and is derived from the Teutonic root seen in *bindan*, to bind; it must be distinguished from the obsolete "bond," meaning originally a householder. In the laws of Canute this word is used as equal to the Old English *ceorl* (see Churl), and thus, as the churl's position became less free after the Norman Conquest, the "bond" approximated to the "villein," and still later to the "serf." The word is in Old English *bonda*, and appears in "husband" (*q.v.*), and is derived from the root of the verb *búa*, to dwell, to have a house, the Latin *colere*, and thus in origin is cognate with German *Bauer* and English "boor." The transition in meaning to the idea of serfdom, and hence to slavery, is due to an early confusion with "bond," from "bind." The same wrong connexion appears in the transition of meaning in "bondage," properly "tenure in villeinage," but now used as synonymous with "slavery." A trace of the early meaning still survives in "bondager" (*q.v.*).

BONDAGER, a word meaning generally a servant, but specially used in the south of Scotland and Northumberland as the term for a female outworker whom a married farm-labourer, living in a cottage attached to the farm, undertakes as a condition of his tenancy to supply for field-labour, sometimes also to board and lodge. The origin of the system was a dearth of field-labour.

BONDE, GUSTAF, Count (1620-1667), Swedish statesman. He is remarkable for being the persistent advocate of a pacific policy at a time when war on the slightest provocation was the watchword of every Swedish politician. Even the popular Polish adventure of Charles X. was strenuously opposed by Bonde, though 200
when once it was decided upon he materially assisted the king to find the means for carrying it on. He was also in favour of strict economy coupled with the recovery of the royal domains which had fallen into the hands of the nobles, though his natural partiality for his fellow-peers came out clearly enough when in 1655 he was appointed a member of Charles X.'s land-recovery commission. In 1659 he succeeded Herman Fleming as lord high treasurer, and was one of the council of regency appointed to govern Sweden during the minority of Charles XI. In 1661 he presented to the senate a plan which aimed at rendering Sweden altogether independent of foreign subsidies, by a policy of peace, economy and trade-development, and by further recovery of alienated estates. His budget in the following year, framed on the same principles, subsequently served as an invaluable guide to Charles XI. Bonde's extraordinary tenacity of purpose enabled him for some years to carry out his programme, despite the opposition of the majority of the senate and his co-regents, who preferred the more adventurous methods of the chancellor Magnus de la Gardie, ultimately so ruinous to Sweden. But the ambition of the oligarchs, and the fear and jealousy of innumerable monopolists who rose in arms against his policy of economy, proved at last too strong for Bonde, while the costly and useless expedition against Bremen in 1665, undertaken contrary to his advice, completed the ruin of the finances. In his later years Bonde's powers of resistance were weakened by sickness and mortification at the triumph of reckless extravagance, and he practically retired from the government some time before his death.

See Martin Veibull, *Sveriges Storhetstid* (Stockholm, 1881).

BONDED WAREHOUSE, a warehouse established by the state, or by private enterprise, in which goods liable to duty are lodged until the duty upon them has been paid. Previous to the establishment of bonded warehouses in England the payment of duties on imported goods had to be made at the time of importation, or a bond with security for future payment given to the revenue authorities. The inconveniences of this system were many; it was not always possible for the importer to find sureties, and he had often to make an immediate sale of the goods, in order to raise the duty, frequently selling when the market was depressed and prices low; the duty, having to be paid in a lump sum, raised the price of the goods by the amount of the interest on the capital required to pay the duty; competition was stifled from the fact that large capital was required for the importation of the more heavily taxed articles; there was also the difficulty of granting an exact equivalent drawback to the exporter, on goods which had already paid duty. To obviate these difficulties and to put a check upon frauds on the revenue, Sir Robert Walpole proposed in his "excise scheme" of 1733, the system of warehousing, so far as concerned tobacco and wine. The proposal, however, was very unpopular, and it was not till 1803 that the system was actually adopted. By an act of that year imported goods were to be placed in warehouses approved by the customs authorities, and importers were to give "bonds" for payment of duties when the goods were removed. It was from this that the warehouses received the name of "bonded" or

"bonding." The Customs Consolidation Act 1853 dispensed with the giving of bonds, and laid down various provisions for securing the payment of customs duties on goods warehoused. These provisions are contained in the Customs Consolidation Act 1876, and the amending statutes, the Customs and Inland Revenue Act 1880, and the Revenue Act 1883. The warehouses are known as "king's warehouses," and by s. 284 of the act of 1876 are defined as "any place provided by the crown or approved by the commissioners of customs, for the deposit of goods for security thereof, and the duties due thereon." By s. 12 of the same act the treasury may appoint warehousing ports or places, and the commissioners of customs may from time to time approve and appoint warehouses in such ports or places where goods may be warehoused or kept, and fix the amount of rent payable in respect of the goods. The proprietor or occupier of every warehouse so approved (except existing warehouses of special security in respect of which security by bond has hitherto been dispensed with), or some one on his behalf, must, before any goods be warehoused therein, give security by bond, or such other security as the commissioners may approve of, for the payment of the full duties chargeable on any goods warehoused therein, or for the due exportation thereof (s. 13). All goods deposited in a warehouse, without payment of duty on the first importation, upon being entered for home consumption, are chargeable with existing duties on like goods under any customs acts in force at the time of passing such entry (s. 19). The act also prescribes various rules for the unshipping, landing, examination, warehousing and custody of goods, and the penalties on breach. The system of warehousing has proved of great advantage both to importers and purchasers, as the payment of duty is deferred until the goods are required, while the title-deeds, or warrants, are transferable by endorsement.

While the goods are in the warehouse ("in bond") the owner may subject them to various processes necessary to fit them for the market, such as the repacking and mixing of tea, the racking, vatting, mixing and bottling of wines and spirits, the roasting of coffee, the manufacture of certain kinds of tobacco, &c., and certain specific allowances are made in respect of waste arising from such processes or from leakage, evaporation and the like.

BONDU, a French protectorate in West Africa, dependent on the colony of Senegal. Bondu lies between the Faleme river and the upper course of the Gambia, that is between 13° and 15° N., and 12° and 13° W. The country is an elevated plateau, with hills in the southern and central parts. These are generally unproductive, and covered with stunted wood; but the lower country is fertile, and finely clothed with the baobab, the tamarind and various valuable fruit-trees. Bondu is traversed by torrents, which flow rapidly during the rains but are empty in the dry season, such streams being known in this part of West Africa as *marigots*. The inhabitants are mostly Fula, though the trade is largely in the hands of Mandingos. The religion and laws of the country are Mahommedan, though the precepts of that faith are not very rigorously observed. Mungo Park, the first European traveller to visit the country, passed through Bondu in 1795, and had to submit to many exactions from the reigning prince. The royal residence was then at Fatteconda; but when Major W. Gray, a British officer who attempted to solve the Niger problem, visited Bondu in 1818 it had been removed to Bulibani, a small town, with about 3000 population, surrounded by a strong clay wall. In August 1845 the king of Bondu signed a treaty recognizing French sovereignty over his country. The treaty was disregarded by the natives, but in 1858 Bondu came definitely under French control. The country has since enjoyed considerable prosperity (see Senegal).

See A. Rançon, *Le Bondou: étude de géographie et d'histoire soudaniennes de 1681 à nos jours* (Bordeaux, 1894).

BONE, HENRY (1755-1834), English enamel painter, was born at Truro. He was much employed by London jewellers for small designs in enamel, before his merits as an artist were well known to the public. In 1800 the beauty of his pieces attracted the notice of the Royal Academy, of which he was then admitted as an associate; in 1811 he was made an academician. Up to 1831 he executed many beautiful miniature pieces of much larger size than had been attempted before in England; among these his eighty-five portraits of the time of Queen Elizabeth, of different sizes, from 5 by 4 to 13 by 8 in. are most admired. They were disposed of by public sale after his death. His Bacchus and Ariadne, after Titian, painted on a plate, brought the great price of 2200 guineas.

BONE (a word common in various forms to Teutonic languages, in many of which it is confined to the shank of the leg, as in the German *Bein*), the hard tissue constituting the framework of the animal skeleton. For anatomy see Skeleton and Connective Tissues.

Bone Diseases and Injuries.—The more specific diseases affecting the bones of the human body are treated under separate headings; in this article *inflammation of bone* and *fractures* are dealt with.

Ostitis (ὀστέον, bone), or inflammation of bone, may be acute or chronic. *Acute ostitis* is one of the most serious diseases which can be met with in young people. It is due to the cultivation of virulent germs in the delicate growing tissue of the bone and in the marrow. Another name for it is *septic osteomyelitis*, which has the advantage of expressing the cause as well as the exact seat

Ostitis.

(μυελός, marrow) of the inflammation. The name of the micro-organism causing the inflammation is *Staphylococcus pyogenes aureus*, which means that the germs collect in clusters like grapes, that they are of the virulent pus-producing kind, and that they have a yellow tinge. As a rule, the germs find their way to the bone by the blood-stream, which they have entered through the membrane lining the mouth or gullet, or some other part of the alimentary canal. In the pre-antiseptic days they often entered the sawn bone during the amputation of a limb, and were not infrequently the cause of blood-poisoning and death. When the individual is well and strong, and there has been no hurt, strain or accident to lower the power of resistance of the bone, the staphylococci may circulate harmlessly in the blood, until they are gradually eaten up by the white corpuscles; but if a bone has been injured it offers a likely and attractive focus to the wandering germs.

The disease is infective. That is to say, the micro-organisms having begun to germinate in the damaged bone find their way by the blood-stream into other tissues, and developing after their kind, are apt to cause blood-poisoning. Should a surgeon prick his finger whilst operating on a case of septic osteomyelitis his blood also might be poisoned, and he would run the risk of losing his finger, his hand, or even his life. The starting-point of the disease is the delicate growing tissue recently deposited between the main part of the shaft of the bone (diaphysis) and the cartilaginous end. And it often happens that the earliest complaint of pain is just above or below the knee; just above the ankle, the elbow or the wrist. If the surgeon is prompt in operating he may find the disease limited to that spot. In the case of infants, the germs are very apt to make their way into the neighbouring joint, giving rise to the very serious disease known as *acute arthritis of infants*.

Probably the first sign of there being anything amiss with the limb will be a complaint of aches or pains near a joint; and these pains are apt to be miscalled rheumatic. Perhaps they occur during convalescence from scarlet or typhoid fever, or after exposure to injury, or to wet or cold, or after unusual fatigue. The part becomes swollen, hot, red and excessively tender; the tenderness, however, is not in the skin but in the bone, and in the engorged membrane around it, the periosteum. The temperature may run up to 104°, and may be associated with convulsions or shiverings. The patient's nights are disturbed, and very likely he has violent delirium. If the case is allowed to drift on, abscess forms, and death may ensue from septic pneumonia, or pericarditis, or from some other form of blood-poisoning.

As soon as the disease is recognized an incision should be made down to the bone, and the affected area should be scraped out, and disinfected with a solution of corrosive sublimate. A considerable area of the bone may be found stripped bare by sub-periosteal abscess, and necrosis is likely to ensue. Perhaps the shaft of the bone will have to be opened up in the chief part of its length in order that it may be cleared of germs and pus. The surgeon is more apt to err on the side of doing too little in these serious cases than too much. It may be that the whole of that piece of bone (diaphysis) which lies between the joint-ends is found loose in a large abscess cavity, and in some cases immediate amputation of the limb may be found necessary in order to save life; in other cases, amputation may be called for later because of long-continued suppuration and grave constitutional disturbance. Several bones may be affected at the same time, and large pieces of them may be killed outright (*multiple necrosis*) by inflammatory engorgement and devastating abscess.

Septic ostitis may be confounded with erysipelas and rheumatism, but the central thickening and tenderness should suffice to distinguish it.

Chronic ostitis and *periostitis* denote long-continued and increased vascular supply. This may be due to injury, syphilis or rheumatism. The disease is found chiefly in the shafts of the bones. There is a dull pain in the bone, which is worse at night, and the inflamed piece of bone is thickened and tender. The lump thus formed is called a *hard node*, and its outline shows clearly by X-rays. The affected limb should be rested and kept elevated. Leeches and fomentations may ease the pain, and iodide of potassium is the most useful medicine.

Chronic inflammation of tuberculous origin affects the soft, cancellated tissue of such bones as the vertebrae, and the bones of the hands and feet, as well as the spongy ends of the long bones. In tuberculous ostitis the presence of the bacilli in the spongy tissue causes an escape of colourless corpuscles from the blood, which, collecting around the bacilli, form a small greyish white heap, a *tubercle*. These tubercles may be present in large numbers at the expense of the living tissue, and a *rarefying ostitis* is thus produced. Later the tubercles break down and form tuberculous abscesses, which slowly, and almost painlessly, find escape upon the surface. They should not be allowed to open spontaneously, however, as the wounds are then likely to become infected with pus-producing germs, and fuel being added to the fire, as it were, destruction advances with increased rapidity. The treatment for these tuberculous foci is to place the limb or the part at absolute rest upon a splint, to give plenty of fresh air to the patient, and to prescribe cod-liver oil and iron. And when it is seen that in spite of the adoption of these measures the tuberculous abscess is advancing towards the surface, the surgeon should cut down upon the part, scrape out the foci, and disinfect with some strong antiseptic lotion. Consideration should also be given to the treatment by injection of tuberculin.

Caries (rottenness, decay) is the name given to tuberculous disease of bone when the tubercles are running together and are breaking down the cancellous tissue. In short, caries generally means tuberculous ostitis, though syphilitic ulceration of bone has also received the same name.

Fractures.—A bone may be broken at the part where it is struck (fracture from direct violence), or it may break in consequence of a strain applied to it (fracture from indirect violence), or the fracture may be due to muscular action as when a violent cough causes a rib to break. In the first case the fracture is generally transverse and in the second more or less oblique. The fully developed bone is broken fairly across; the soft bones of young people may simply be bent—*green stick* or *willow fracture*. Fractures are either *simple* or *compound*. A simple fracture is analogous to the subcutaneous laceration in the soft parts, and a compound one to an open wound in the soft parts. The wound of the soft parts in the compound fracture may be due either to the force which caused the fracture, as in the case of a cart-wheel going over a limb, first wounding the soft parts and then fracturing the bone, or to the sharp point of the fractured bone coming out through the skin. In either case there is a communication between the external air and injured bone, and the probability arises of the germs of suppuration finding their way to the seat of fracture. This greatly increases the risks of the case, for septic inflammation and suppuration may lead to delayed union, to death of large pieces of the bone (necrosis), and to osteomyelitis and to blood-poisoning. In the treatment of a fracture, every care should be taken to prevent any sharp fragment coming near the skin.

Fracture.

Careless handling has often been the means of a simple fracture being converted into a compound one.

In most cases of fracture *crepitus* can be made out; this is the feeling elicited when two rough osseous surfaces are rubbed together. When a bone is merely bent there is, of course, no crepitus. It is also absent in fractures in which the broken extremities are driven into one another (impacted fracture). In order to get firm bony union it is necessary to secure accurate apposition of the fragments. Putting the broken ends together is termed “setting the fracture,” and the needful amount of rest is obtained by the use of splints. As a rule, it is also advisable to fix with the splint the joint above or below the fracture. In cases in which a splintering of the bone into a joint has taken place, more especially in those cases in which tendons have been injured, there may be a good deal of effusion into the joint and the tendon sheaths, and this may be organized into fibrous tissue leading to permanent stiffness. This is particularly apt to occur in old people. Care must be taken in such instances by gentle exercises, and by passive movement during the process of cure, to keep the joint and tendons free. To take a common example,—in fracture close to the wrist joint, it is necessary to arrange the splint so that the patient can move his fingers and thumb, and the splint must be taken off every day, in order that the wrist and fingers may be gently bent, straightened and exercised.

The treatment of fractures has undergone considerable improvement of late years. Simple fractures are not kept so long at rest in splints, but are constantly “taken down” in order that massage and movements of the limb may be resorted to. This, of course, is done with the utmost gentleness, and with the result that swelling, pain and other evidences of the serious injury quickly disappear, whilst a more rapid and complete recovery is ensured. Stiff hands and feet after fracture are much less frequently met with. By the aid of the X-rays it is now easy for the surgeon to assure himself that fractured surfaces have been well adjusted and are in close apposition. But if they are not in a satisfactory position, and it be found impracticable to assure their close adjustment by ordinary methods, the surgeon now, without undue loss of time, cuts down upon the broken ends and fixes them together by a strong wire suture, which remains permanently in the tissues. If the fracture be associated with an open wound of the part (compound fracture), and the broken ends are found incapable of easy adjustment, immediate wiring together of the fragments is now considered to be a necessary part of the primary treatment. The French surgeon, Just Lucas-Championnière, has done more than any one else to show the advantage of discreet movements, of massage and of exercises in the treatment of fractures.

Special Fracture in Young People.—The long bones of children and growing persons consist of a shaft with cartilaginous ends in which bone is developed. As the result of injury, the end of the bone may become detached, a variety of fracture known as *diastasis*. Such a fracture—however well treated—may be followed by arrest of growth of the bone or by stiffness of the neighbouring joint.

Delayed union means that consolidation is taking place very slowly, if at all. This may be due to local or constitutional causes, but provided the bones are in good position, nothing further than patience, with massage, and with due attention to general health-measures, is necessary.

An *ununited fracture* is one in which after many weeks or months no attempt has been made by nature to consolidate the parts. This may be due to the ends not having been brought close enough together; to the seat of fracture having been constantly disturbed; to muscle or tendon being interposed between the broken ends, or to the existence of some constitutional defect in the patient. Except in the last-named condition, the treatment consists in cutting down to the broken ends; freshening them up by sawing off a thin slice, and by adjusting and fixing them by a wire or screw. Ununited fracture of the leg-bones in children is a most unsatisfactory and rebellious condition to deal with.

There is still a difference of opinion as to the best way of treating a recent *fracture of the patella* (knee-cap). Many surgeons are still content to follow the old plan of fixing the limb on a back-splint, or in plaster of Paris splints, and awaiting the result. It is beyond question that a large percentage of these cases recover with a perfectly useful limb—especially if the fibrous bond of union between the pieces of the broken knee-cap is adequately protected against being stretched by bending the leg at too early a date. But in some cases the fragments have been eventually found wide apart, the patient being left with an enfeebled limb. Still, at any rate, this line of treatment was unassociated with risk. But after Lister showed (1883) that with due care and cleanliness the knee-joint could be opened, and the fragments of the broken patella secured in close apposition by a stout wire suture, the treatment of the injury underwent a remarkable change. The great advantage of Lister’s treatment was that the fragments, being fixed close together by the wire stitch, became solidly united by bone, and the joint became as sound as it was before. Some surgeons, however, objected to the operation—in spite of the excellence of the results obtainable by it—because of the undoubted risk which it entailed of the joint becoming invaded by septic micro-organisms. As a sort of compromise, Professor A.E.J. Barker introduced the method, which he deemed to be less hazardous, of holding the fragments close together by means of a strong silver wire passed round them vertically by a large needle without actually laying open the joint. But experience has shown that in the hands of careful and skilful surgeons Lister’s operation of openly wiring the fragments gives a perfect result with a comparatively small risk. Other surgeons secure the fragments in close contact for bony union by passing a silk or metal suture around them circumferentially. Many years ago Lister remarked that the careful selection of one’s patients is an antiseptic measure—by which he meant that if a surgeon intended to get the most perfect results for his operative work, he must carefully consider whether any individual patient is physically adapted for the performance upon him of any particular operation. This aphorism implies that not every patient with a broken knee-cap is suited for the opening of his knee-joint, or even for the subcutaneous adjustment of the broken fragments. An operative procedure which is admirably suited for one patient might result in disaster when adopted for another, and it is an important part of the surgeon’s business to know what to advise in each individual case.

(E. O.*)

Industrial Applications of Bones.—By the increasing inventiveness of man, the industrial utilization of animal bone has been so developed that not one of the constituents fails to reappear in commerce. Composed of mineral matter—phosphates, &c.—fat and gelatinous substances, the phosphates are used as artificial manures, the fat is worked up by the soap-maker and chandler, and the gelatinous matter forms the basis of the gelatin and glue of commerce; while by the dry distillation of bones from which the gelatin has been but partially removed, there are obtained a carbonaceous residue—animal charcoal—and a tarry distillate, from which “bone oil” and bone pitch are obtained. To these by-products there must be added the direct uses of bone—for making buttons, knife-handles, &c.—when an estimate is desired of the commercial importance of these components of

the animal frame.

While most of the world's supply of bones goes to the glue and gelatin works, the leg and thigh bones, termed "marrows" and "knuckles," are used for the manufacture of bone articles. The treatment which they receive is very different from that practised in the glue-works. The ends are removed by a saw, and the bones are steeped in a 1% brine solution for three to four days, in order to separate the fibrous matter. The bones are now heated with water, and allowed to simmer for about six hours. This removes a part of the fat and gelatinous matter; the former rises as a scum, the latter passes into solution, and the bones remain sufficiently firm to be worked up by the lathe, &c. The fat is skimmed off, and, after bleaching, reappears as a component of fine soaps, or, if unbleached, the oil is expressed and is used as an adulterant of other oils, while the stearine or solid matter goes to the candle-maker; the gelatinous water is used (after filtration) for making size for cardboard boxes; while the bones are scrubbed, dried, and then transferred to the bone-worker.

The glue-worker first removes the fat, which is supplied to the soap and candle trades; the bones are now treated for glue (*q.v.*); and the residue is worked up for manures, &c. These residues are ground to a fine or coarse meal, and supplied either directly as a fertilizer or treated with sulphuric acid to form the more soluble superphosphates, which are more readily assimilated by growing plants. In some places, especially South America, the residues are burned in a retort to a white ash, the "bone-ash" of commerce, which contains some 70-80% of tricalcium phosphate, and is much used as a manure, and in the manufacture of high-grade superphosphates. In the gelatin industry (see GELATIN) the mineral matter has to be recovered from its solution in hydrochloric acid. To effect this, the liquors are freed from suspended matter by filtration, and then run into vats where they are mixed with milk of lime, or some similar neutralizer. The slightly soluble bicalcium phosphate, $CaHPO_4$, is first precipitated, which, with more lime, gives ordinary tricalcium phosphate, $Ca_3(PO_4)_2$. The contents of the vats are filter-pressed, and the cakes dried on plates supported on racks in heated chambers. This product is a very valuable manure, and is also used in the manufacture of phosphorus. 203

Instead of extracting all the gelatinous matter from degreased bones, the practice of extracting about one half and carbonizing the residue is frequently adopted. The bones are heated in horizontal cast-iron retorts, holding about 5 cwt., and the operation occupies about twelve to thirteen hours. The residue in the retorts is removed while still red-hot to air-tight vessels in which it is allowed to cool. It is then passed through grinding mills, and is subsequently riddled by revolving cylindrical sieves. The yield is from 55 to 60% of the bones carbonized, and the product contains about 10% of carbon and about 75% of calcium phosphate, the remainder being various inorganic salts and moisture (6-7%). Animal charcoal has a deep black colour, and is much used as a filtering and clarifying material. The vapours evolved during carbonization are condensed in vertical air condensers. The liquid separates into two layers: the upper tarry layer is floated off and redistilled; the distillate is termed "bone oil,"[1] and mainly consists of many fatty amines and pyridine derivatives, characterized by a most disgusting odour; the residue is "bone pitch," and finds application in the manufacture of black varnishes and like compositions. The lower layer is ammoniacal liquor; it is transferred to stills, distilled with steam, and the ammonia received in sulphuric acid; the ammonium sulphate, which separates, is removed, drained and dried, and is principally used as a manure. Both during the carbonization of the bones and the distillation of the tar inflammable gases are evolved; these are generally used, after purification, for motive or illuminating purposes.

(C. E.*)

1 Bone oil, also known as Dippel's oil, was originally produced by the distillation of stags' horns; it is of interest in the history of chemistry, since from it were isolated in 1846 by T. Anderson pyridine and some of its homologues.

BONE BED, a term loosely used by geologists when speaking generally of any stratum or deposit which contains bones of whatever kind. It is also applied to those brecciated and stalagmitic deposits on the floor of caves, which frequently contain osseous remains. In a more restricted sense it is used to connote certain thin layers of bony fragments, which occur upon well-defined geological horizons. One of the best-known of these is the Ludlow Bone Bed, which is found at the base of the Downton Sandstone in the Upper Ludlow series. At Ludlow itself, two such beds are actually known, separated by about 14 ft. of strata. Although quite thin, the Ludlow Bone Bed can be followed from that town into Gloucestershire for a distance of 45 m. It is almost made up of fragments of spines, teeth and scales of ganoid fish. Another well-known bed, formerly known as the "Bristol" or "Lias" Bone Bed, exists in the form of several thin layers of micaceous sandstone, with the remains of fish and saurians, which occur in the Rhaetic Black Paper Shales that lie above the Keuper marls in the south-west of England. It is noteworthy that a similar bone bed has been traced on the same geological horizon in Brunswick, Hanover and Franconia. A bone bed has also been observed at the base of the Carboniferous limestone series in certain parts of the south-west of England.

BONE-LACE, a kind of lace made upon a cushion from linen thread; the pattern is marked out with pins, round which are twisted the different threads, each wound on its own bobbin. The lace was so called from the fact that bobbins were formerly made of bone.

BONER (or BONERIUS), **ULRICH** (fl. 14th century), German-Swiss writer of fables, was born in Bern. He was descended of an old Bernese family, and, as far as can be ascertained, took clerical orders and became a monk;

yet as it appears that he subsequently married, it is certain that he received the “tonsure” only, and was thus entitled to the benefit of the *clerici uxoriati*, who, on divesting themselves of the clerical garb, could return to secular life. He is mentioned in records between 1324 and 1349, but neither before nor after these dates. He wrote, in Middle High German, a collection of fables entitled *Der Edelstein* (*c*. 1349), one hundred in number, which were based principally on those of Avianus (4th century) and the *Anonymus* (edited by I. Nevelet, 1610). This work he dedicated to the Bernese patrician and poet, Johann von Rinkenberg, advocatus (*Vogt*) of Brienz (d. *c*. 1350). It was printed in 1461 at Bamberg; and it is claimed for it that it was the first book printed in the German language. Boner treats his sources with considerable freedom and originality; he writes a clear and simple style, and the necessarily didactic tone of the collection is relieved by touches of humour.

Der Edelstein has been edited by G.F. Benecke (Berlin, 1816) and Franz Pfeiffer (Leipzig, 1844); a translation into modern German by K. Pannier will be found, in Reclam’s *Universal-Bibliothek* (Leipzig, 1895). See also G.E. Lessing in *Zur Geschichte und Literatur* (*Werke*, ix.); C. Waas, *Die Quellen der Beispiele Boners* (Giessen, 1897).

BO’NESS, or Borrowstounness, a municipal and police burgh and seaport of Linlithgowshire, Scotland. Pop. (1891) 6295; (1901) 9306. It lies on the southern shore of the Firth of Forth, 17 m. W. by N. of Edinburgh, and 24 m. by rail, being the terminus of the North British railway’s branch line from Manuel. In the 18th century it ranked next to Leith as a port, but the growth of Grangemouth, higher up the firth, seriously affected its shipping trade, which is, however, yet considerable, coal and pig-iron forming the principal exports, and pit props from the Baltic the leading import. It has an extensive harbour (the area of the dock being 7¾ acres). The great industries are coal-mining—some of the pits extending for a long distance beneath the firth—iron-founding (with several blast furnaces) and engineering, but it has also important manufactures of salt, soap, vitriol and other chemicals. Shipbuilding and whaling are extinct. Traces of the wall of Antoninus which ran through the parish may still be made out, especially near Inveravon. Blackness, on the coast farther east, was the seaport of Linlithgow till the rise of Bo’ness, but its small export trade now mainly consists of coal, bricks, tiles and lime. Its castle, standing on a promontory, is of unknown age. James III. of Scotland is stated to have consigned certain of the insurgent nobles to its cells; and later it was used as a prison in which many of the Covenanters were immured. It was one of the four castles that had to be maintained by the Articles of Union, but when its uselessness for defensive purposes became apparent, it was converted into an ammunition depot. Kinneil House, 1 m. south of Bo’ness, a seat of the duke of Hamilton, formerly a keep, was fortified by the regent Arran, plundered by the rebels in Queen Mary’s reign, and reconstructed in the time of Charles II. Dr John Roebuck (1718-1794), founder of the Carron Iron Works, occupied it for several years from 1764. It was here that, on his invitation, James Watt constructed a model of his steam-engine, which was tested in a now disused colliery. Though Roebuck lost all his money in the coal-mines and salt works which he established at Bo’ness, the development of the mineral resources of the district may be regarded as due to him.

BONFIGLI, BENEDETTO, 15th century Italian painter, was born at Perugia. Until near the middle of the 15th century the Umbrian school was far behind those of Florence and the North, but in the person of Perugino and some of his followers it suddenly advanced into the very first rank. Among the latter none holds a more distinguished place than Benedetto Bonfigli. The most important of his extant works are a series, in fresco, of the life of St Louis of Toulouse, in the communal palace of Perugia.

BONFIRE (in Early English “bone-fire,” Scottish “bane-fire”), originally a fire of bones, now any large fire lit in the open air on an occasion of rejoicing. Though the spelling “bonfire” was used in the 16th century, the earlier “bone-fire” was common till 1760. The earliest known instance of the derivation of the word occurred as *ban fyre ignis ossium* in the *Catholicon Anglicum*, A.D. 1483. Other derivations, now rejected, have been sought for the word. Thus some have thought it *Baal-fire*, passing through *Bael*, *Baen* to *Bane*. Others have declared it to be *boon*-fire by analogy with *boen-harow*, *i.e.* “harrowing by gift,” the suggestion being that these fires were “contribution” fires, every one in the neighbourhood contributing a portion of the material, just as in Northumberland the “contributed Ploughing Days” are known as *Bone-daags*.

Whatever the origin of the word, it has long had several meanings-(*a*) a fire of bones, (*b*) a fire for corpses, a funeral pile, (*c*) a fire for immolation, such as that in which heretics and proscribed books were burnt, (*d*) a large fire lit in the open air, on occasions of national rejoicing, or as a signal of alarm such as the bonfires which warned England of the approach of the Armada. Throughout Europe the peasants from time immemorial have lighted bonfires on certain days of the year, and danced around or leapt over them. This custom can be traced back to the middle ages, and certain usages in antiquity so nearly resemble it as to suggest that the bonfire has its origin in the early days of heathen Europe. Indeed the earliest proof of the observance of these bonfire ceremonies in Europe is afforded by the attempts made by Christian synods in the 7th and 8th centuries to suppress them as pagan. Thus the third council of Constantinople (A.D. 680), by its 65th canon, orders: “Those fires that are kindled by certaine people on new moones before their shops and houses, over which also they use ridiculously and foolishly to leape, by a certaine antient custome, we command them from henceforth to cease.” And the Synodus Francica under Pope Zachary, A.D. 742, forbids “those sacrilegious fires which they

call *Nedfri* (or bonefires), and all other observations of the Pagans whatsoever." Leaping over the fires is mentioned among the superstitious rites used at the Palilia (the feast of Pales, the shepherds' goddess) in Ovid's *Fasti*, when the shepherds lit heaps of straw and jumped over them as they burned. The lighting of the bonfires in Christian festivals was significant of the compromise made with the heathen by the early Church. In Cornwall bonfires are lighted on the eve of St John the Baptist and St Peter's day, and midsummer is thence called in Cornish *Goluan*, which means both "light" and "festivity." Sometimes effigies are burned in these fires, or a pretence is made of burning a living person in them, and there are grounds for believing that anciently human sacrifices were actually made in the bonfires. Spring and midsummer are the usual times at which these bonfires are lighted, but in some countries they are made at Hallowe'en (October 31) and at Christmas. In spring the 1st Sunday in Lent, Easter eve and the 1st of May are the commonest dates.

See J.G. Frazer, *Golden Bough*, vol. iii., for a very full account of the bonfire customs of Europe, &c.

BONGARS, JACQUES (1554-1612), French scholar and diplomatist, was born at Orleans, and was brought up in the reformed faith. He obtained his early education at Marburg and Jena, and returning to France continued his studies at Orleans and Bourges. After spending some time in Rome he visited eastern Europe, and subsequently made the acquaintance of Ségur Pardaillan, a representative of Henry, king of Navarre, afterwards Henry IV. of France. He entered the service of Pardaillan, and in 1587 was sent on a mission to many of the princes of northern Europe, after which he visited England to obtain help from Queen Elizabeth for Henry of Navarre. He continued to serve Henry as a diplomatist, and in 1593 became the representative of the French king at the courts of the imperial princes. Vigorously seconding the efforts of Henry to curtail the power of the house of Habsburg, he spent health and money ungrudgingly in this service, and continued his labours until the king's murder in 1610. He then returned to France, and died at Paris on the 29th of July 1612. Bongars wrote an abridgment of Justin's abridgment of the history of Trogus Pompeius under the title *Justinus, Trogi Pompeii Historiarum Philippicarum epitoma de manuscriptis codicibus emendatior et prologis auctior* (Paris, 1581). He collected the works of several French writers who as contemporaries described the crusades, and published them under the title *Gesta Dei per Francos* (Hanover, 1611). Another collection made by Bongars is the *Rerum Hungaricarum scriptores varii* (Frankfort, 1600). His *Epistolae* were published at Leiden in 1647, and a French translation at Paris in 1668-1670. Many of his papers are preserved in the library at Bern, to which they were presented in 1632, and a list of them was made in 1634. Other papers and copies of instructions are now in several libraries in Paris; and copies of other instructions are in the British Museum.

See H. Hagen, *Jacobus Bongarsius* (Bern, 1874); L. Anquez, *Henri IV et l'Allemagne* (Paris, 1887).

BONGHI, RUGGERO (1828-1895), Italian scholar, writer and politician, was born at Naples on the 20th of March 1828. Exiled from Naples in consequence of the movement of 1848, he took refuge in Tuscany, whence he was compelled to flee to Turin on account of a pungent article against the Bourbons. At Turin he resumed his philosophic studies and his translation of Plato, but in 1858 refused a professorship of Greek at Pavia, under the Austrian government, only to accept it in 1859 from the Italian government after the liberation of Lombardy. In 1860, with the Cavour party, he opposed the work of Garibaldi, Crispi and Bertani at Naples, and became secretary of Luigi Carlo Farini during the latter's lieutenancy, but in 1865 assumed contemporaneously the editorship of the *Perseveranza* of Milan and the chair of Latin literature at Florence. Elected deputy in 1860 he became celebrated by the biting wit of his speeches, while, as journalist, the acrimony of his polemical writings made him a redoubtable adversary. Though an ardent supporter of the historic Right, and, as such, entrusted by the Lanza cabinet with the defence of the law of guarantees in 1870, he was no respecter of persons, his caustic tongue sparing neither friend nor foe. Appointed minister for public instruction in 1873, he, with feverish activity, reformed the Italian educational system, suppressed the privileges of the university of Naples, founded the Vittorio Emanuele library in Rome, and prevented the establishment of a Catholic university in the capital. Upon the fall of the Right from power in 1876 he joined the opposition, and, with characteristic vivacity, protracted during two months the debate on Baccelli's University Reform Bill, securing, single-handed, its rejection. A bitter critic of King Humbert, both in the *Perseveranza* and in the *Nuova Antologia*, he was, in 1893, excluded from court, only securing readmission shortly before his death on the 22nd of October 1895. In foreign policy a Francophil, he combated the Triple Alliance, and took considerable part in the organization of the inter-parliamentary peace conference.

(H. W. S.)

BONGO (Dor or Deran), a tribe of Nilotic negroes, probably related to the Zandeh tribes of the Welle district, inhabiting the south-west portion of the Bahr-el-Ghazal province, Anglo-Egyptian Sudan. G.A. Schweinfurth, who lived two years among them, declares that before the advent of the slave-raiders, *c.* 1850, they numbered at least 300,000. Slave-raiders, and later the dervishes, greatly reduced their numbers, and it was not until the establishment of effective control by the Sudan government (1904-1906) that recuperation was possible. The Bongo formerly lived in countless little independent and peaceful communities, and under the Sudan government they again manage their own affairs. Their huts are well built, and sometimes 24 ft. high. The Bongo are a race of medium height, inclined to be thick-set, with a red-brown complexion—"like the soil upon

which they reside”—and black hair. Schweinfurth declares their heads to be nearly round, no other African race, to his knowledge, possessing a higher cephalic index. The women incline to steatopygia in later life, and this deposit of fat, together with the tail of bast which they wore, gave them, as they walked, Schweinfurth says, the appearance of “dancing baboons.” The Bongo men formerly wore only a loin-cloth, and many dozen iron rings on the arms (arranged to form a sort of armour), while the women had simply a girdle, to which was attached a tuft of grass. Both sexes now largely use cotton cloths as dresses. The tribal ornaments consist of nails or plugs which are passed through the lower lip. The women often wear a disk several inches in diameter in this fashion, together with a ring or a bit of straw in the upper lip, straws in the *alae* of the nostrils, and a ring in the *septum*. The Bongo, unlike other of the upper Nile Negroes, are not great cattle-breeders, but employ their time in agriculture. The crops mostly cultivated are sorghum, tobacco, sesame and durra. The Bongo eat the fruits, tubers and fungi in which the country is rich. They also eat almost every creature—bird, beast, insect and reptile, with the exception of the dog. They despise no flesh, fresh or putrid. They drive the vulture from carrion, and eat with relish the intestinal worms of the ox. Earth-eating, too, is common among 205
them. They are particularly skilled in the smelting and working of iron. Iron forms the currency of the country, and is extensively employed for all kinds of useful and ornamental purposes. Bongo spears, knives, rings, and other articles are frequently fashioned with great artistic elaboration. They have a variety of musical instruments—drums, stringed instruments, and horns—in the practice of which they take great delight; and they indulge in a vocal recitative which seems intended to imitate a succession of natural sounds. Schweinfurth says that Bongo music is like the raging of the elements. Marriage is by purchase; and a man is allowed to acquire three wives, but not more. Tattooing is partially practised. As regards burial, the corpse is bound in a crouching position with the knees drawn up to the chin; men are placed in the grave with the face to the north, and women with the face to the south. The form of the grave is peculiar, consisting of a niche in a vertical shaft, recalling the mastaba graves of the ancient Egyptians. The tombs are frequently ornamented with rough wooden figures intended to represent the deceased. Of the immortality of the soul they have no defined notion; and their only approach to a knowledge of a beneficent deity consists in a vague idea of luck. They have, however, a most intense belief in a great variety of petty goblins and witches, which are essentially malignant. Arrows, spears and clubs form their weapons, the first two distinguished by a multiplicity of barbs. Euphorbia juice is used as a poison for the arrows. Shields are rare. Their language is musical, and abounds in the vowels *o* and *a*; its vocabulary of concrete terms is very rich, but the same word has often a great variety of meanings. The grammatical structure is simple. As a race the Bongo are gentle and industrious, and exhibit strong family affection.

See G.A. Schweinfurth, *The Heart of Africa* (London, 1873); W. Junker, *Travels in Africa* (Eng. edit., London, 1890-1892).

BONGO (*Boöcercus eurycerus*), a West African bushbuck, the largest of the group. The male is deep chestnut, marked on the body with narrow white stripes, on the chest with a white crescent, and on the face by two white spots below the eye. In the East African bongo (*B. e. Isaaei*) the body hue is stronger and richer. There is, as yet, no evidence as to whether the females of the true bongo bear horns, though it is probable they do; but as the horns are present in both sexes of the East African form, Mr Oldfield Thomas has made that the type of the genus.[1]

1 *Annals and Mag. Nat. Hist.* vol. x. (seventh series), p. 309.

BONHAM, a town and the county-seat of Fannin county, Texas, U.S.A., about 14 m. S. of the Red river, in the north-east part of the state, and 70 m. N. of Dallas. Pop. (1890) 3361; (1900) 5042 (1223 being negroes); (1910), 4844. It is served by the Missouri, Kansas & Texas, and the Texas & Pacific railways. Bonham is the seat of Carlton College (Christian), a woman’s college founded in 1867; and its high school is one of the best in the state. It is a trading and shipping centre of an extensive farming territory devoted to the raising of live-stock and to the growing of cotton, Indian corn, fruit, &c. It has large cotton gins and compresses, a large cotton mill, flour mills, canning and ice factories, railway repair shops, planing mills and carriage works. The town was named in honour of J.B. Bonham, a native of South Carolina, who was killed in the Alamo. The first settlement here was made in 1836. The town was incorporated in 1850, and was re-incorporated in 1886.

BONHEUR [Marie Rosalie], **ROSA** (1822-1899), French painter, was born at Bordeaux on the 22nd of March 1822. She was of Jewish origin. Jacques Wiener, the Belgian medallist, a native of Venloo, says that he and Raymond Bonheur, Rosa’s father, used to attend synagogue in that town; while another authority asserts that Rosa used to be known in common parlance by the name of Rosa Mazeltov (a Hebrew term for “good luck,” *Gallicé* Bonheur). She was the eldest of four children, all of whom were artists—Auguste (1824-1884) painted animals and landscape; Juliette (1830-1891) was “honourably mentioned” at the exhibition of 1855; Isidore, born in 1827, was a sculptor of animals. Rosa at an early age was taught to draw by her father (who died in 1849), and he, perceiving her very remarkable talent, permitted her to abandon the business of dressmaking, to which, much against her will, she had been put, in order to devote herself wholly to art. From 1840 to 1845 she

exhibited at the salon, and five times received a prize; in 1848 a medal was awarded to her. Her fame dates more especially from the exhibition of 1855; from that time Rosa Bonheur's works were much sought after in England, where collectors and public galleries competed eagerly for them. What is chiefly remarkable and admirable in her work is that, like her contemporary, Jacques Raymond Brascassat (1804-1867), she represents animals as they really are, as she saw them in the country. Her gift of accurate observation was, however, allied to a certain dryness of style in painting; she often failed to give a perfect sense of atmosphere. On the other hand, the anatomy of her animals is always faultlessly true. There is nothing feminine in her handling; her treatment is always manly and firm. Of her many works we may note the following:—"Ploughing in the Nivernais" (1848), in the Luxembourg gallery; "The Horse Fair" (1853), one of the two replicas of which is in the National Gallery, London, the original being in the United States; and "Hay Harvest in Auvergne" (1835). She was decorated with the Legion of Honour by the empress Eugénie, and was subsequently promoted to the rank of "officer" of the order. After 1867 Rosa Bonheur exhibited but once in the salon, in 1899, a few weeks before her death. She lived quietly at her country house at By, near Fontainebleau, where for some years she had held gratuitous classes for drawing. She left at her death a considerable number of pictures, studies, drawings and etchings, which were sold by auction in Paris in the spring of 1900.

(H. Fr.)

BONHEUR DU JOUR, the name for a lady's writing-desk, so called because, when it was introduced in France about 1760, it speedily became intensely fashionable. The bonheur du jour is always very light and graceful; its special characteristic is a raised back, which may form a little cabinet or a nest of drawers, or may simply be fitted with a mirror. The top, often surrounded with a chased and gilded bronze gallery, serves for placing small ornaments. Beneath the writing surface there is usually a single drawer. The details vary greatly, but the general characteristics are always traceable. The bonheur du jour has never been so delicate, so charming, so coquettish as in the quarter of a century which followed its introduction. The choicer examples of the time are inlaid with marqueterie, edged with exotic woods, set in gilded bronze, or enriched with panels of Oriental lacquer.

BONI (*Boné*), a vassal state of the government of Celebes, Dutch East Indies, in the south-west peninsula of Celebes, on the Gulf of Boni. Area, 2600 sq. m. It produces rice, tobacco, coffee, cotton and sugar-cane, none of them important as exports. The breeds of buffaloes and horses in this state are highly esteemed. The chief town, Boni, lies 80 m. N.E. of Macassar, and 2½ m. from the east coast of the peninsula. The native race of Bugis (*q.v.*), whose number within this area is about 70,000, is one of the most interesting in the whole archipelago.

Boni was once the most powerful state of Celebes, all the other princes being regarded as vassals of its ruler, but its history is not known in detail. In 1666 the rajah Palakkah, whose father and grandfather had been murdered by the family of Hassan, the tyrant of Sumatra, made common cause with the Dutch against that despot. From that date till the beginning of the 19th century Dutch influence in the state remained undisputed. In 1814, however, Boni fell into the hands of the British, who retained it for two years; but by the European treaties concluded on the downfall of Napoleon it reverted to its original colonizers. Their influence, however, was resisted more than once by the natives. An expedition in 1825, under General van Geen, was not fully successful in enforcing it; and in 1858 and the following year two expeditions were necessary to oppose an attempt by the princess regent towards independence. In 1860 a new prince, owning allegiance to the Dutch, was set up. As in other native states in Celebes, succession to the throne in the female line has precedence over the male line.

For the wars in Boni, see Perelaer, *De Bonische expeditiën, 1859-1860* (Leiden, 1872); and Meyers, in the *Militaire Spectator* (1880).

BONIFACE, SAINT (680-754), the apostle of Germany, whose real name was Wynfrith, was born of a good Saxon family at Crediton or Kirton in Devonshire. While still young he became a monk, and studied grammar and theology first at Exeter, then at Nutcell near Winchester, under the abbot Winberht. He soon distinguished himself both as scholar and preacher, and had every inducement to remain in his monastery, but in 716 he followed the example of other Saxon monks and set out as missionary to Frisia. He was soon obliged to return, however, probably owing to the hostility of Radbod, king of the Frisians, then at war with Charles Martel. At the end of 717 he went to Rome, where in 719 Pope Gregory II. commissioned him to evangelize Germany and to counteract the influence of the Irish monks there. Crossing the Alps, Boniface visited Bavaria and Thuringia, but upon hearing of the death of Radbod he hurried again to Frisia, where, under the direction of his countryman Willibrord (d. 738), the first bishop of Utrecht, he preached successfully for three years. About 722 he visited Hesse and Thuringia, won over some chieftains, and converted and baptized great numbers of the heathen. Having sent special word to Gregory of his success, he was summoned to Rome and consecrated bishop on the 30th of November 722, after taking an oath of obedience to the pope. Then his mission was enlarged. He returned with letters of recommendation to Charles Martel, charged not only to convert the heathen but to suppress heresy as well.

Charles's protection, as he himself confessed, made possible his great career. Armed with it he passed safely into heathen Germany and began a systematic crusade, baptizing, overturning idols, founding churches and monasteries, and calling from England a band of missionary helpers, monks and nuns, some of whom have become famous: St Lull, his successor in the see at Mainz; St Burchard, bishop of Würzburg; St Gregory, abbot at Utrecht; Willibald, his biographer; St Lioba, St Walburge, St Thecla. In 732 Boniface was created archbishop. In 738 for the third time he went to Rome. On his return he organized the church in Bavaria into the four bishoprics of Regensburg, Freising, Salzburg and Passau. Then his power was extended still further. In 741 Pope Zacharias made him legate, and charged him with the reformation of the whole Frankish church. With the support of Carloman and Pippin, who had just succeeded Charles Martel as mayors of the palace, Boniface set to work. As he had done in Bavaria, he organized the east Frankish church into four bishoprics, Erfurt, Würzburg, Buraburg and Eichstädt, and set over them his own monks. In 742 he presided at what is generally counted as the first German council. At the same period he founded the abbey of Fulda, as a centre for German monastic culture, placing it under the Bavarian Sturm, whose biography gives us so many picturesque glimpses of the time, and making its rule stricter than the Benedictine. Then came a theological and disciplinary controversy with Virgil, the Irish bishop of Salzburg, who held, among other heresies, that there were other worlds than ours. Virgil must have been a most remarkable man; in spite of his leanings toward science he held his own against Boniface, and was canonized after his death. Boniface was more successful in France. There a certain Adalbert or Aldebert, a Frankish bishop of Neustria, had caused great disturbance. He had been performing miracles, and claimed to have received his relics, not from Rome like those of Boniface, but directly from the angels. Planting crosses in the open fields he drew the people to desert the churches, and had won a great following throughout all Neustria. Opinions are divided as to whether he was a Culdee, a representative of a national Frankish movement, or simply the charlatan that Boniface paints him. At the instance of Pippin, Boniface secured Adalbert's condemnation at the synod of Soissons in 744; but he, and Clement, a Scottish missionary and a heretic on predestination, continued to find followers in spite of legate, council and pope, for three or four years more.

Between 746 and 748 Boniface was made bishop of Mainz, and became metropolitan over the Rhine bishoprics and Utrecht, as well as over those he had established in Germany—thus founding the pre-eminence of the see of Mainz. In 747 a synod of the Frankish bishops sent to Rome a formal statement of their submission to the papal authority. The significance of this act can only be realized when one recalls the tendencies toward the formation of national churches, which had been so powerful under the Merovingians. Boniface does not seem to have taken part in the anointing of Pippin as king of the Franks in 752. In 754 he resigned his archbishopric in favour of Lull, and took up again his earliest plan of a mission to Frisia; but on the 5th of June 754 he and his companions were massacred by the heathen near Dockum. His remains were afterwards taken to Fulda.

St Boniface has well been called the proconsul of the papacy. His organizing genius, even more than his missionary zeal, left its mark upon the German church throughout all the middle ages. The missionary movement which until his day had been almost independent of control, largely carried on by schismatic Irish monks, was brought under the direction of Rome. But in so welding together the scattered centres and binding them to the papacy, Boniface seems to have been actuated by simple zeal for unity of the faith, and not by a conscious political motive.

Though pre-eminently a man of action, Boniface has left several literary remains. We have above all his Letters (*Epistolae*), difficult to date, but extremely important from the standpoint of history, dogma, or literature; see Dümmler's edition in the *Monumenta Germaniae historica*, 1892. Besides these there are a grammar (*De octo partibus orationibus*, ed. Mai, in *Classici Auctores*, t. vii.), some sermons of contested authenticity, some poems (*Aenigmata*, ed. Dümmler, *Poetae latini aevi Carolini*, i. 1881), a penitential, and some *Dicta Bonifacii* (ed. Nürnberger in *Theologische Quartalschrift*, Tübingen, vol. 70, 1888), the authenticity of which it is hard to prove or to refute. Migne in his *Patrologia Latina* (vol. 89) has reproduced the edition of Boniface's works by Giles (London, 1844).

There are very many monographs on Boniface and on different phases of his life (see Potthast, *Bibliotheca medii aevi*, and Ulysse Chevalier's *Bibliographie*, 2nd ed. for indications), but none that is completely satisfactory. Among recent studies are those of B. Kuhlmann, *Der heilige Bonifatius, Apostel der Deutschen* (Paderborn, 1895), and of G. Kurth, *Saint Boniface* (2nd ed., 1902). W. Levison has edited the *Vitae sancti Bonifatii* (Hanover, 1905).

(J. T. S.*)

BONIFACE (*Bonifacius*), the name of nine of the popes.

Boniface I., bishop of Rome from 418 to 422. At the death of Pope Zosimus, the Roman clergy were divided into two factions, one of which elected the deacon Eulalius, and the other the priest Boniface. The imperial government, in the interests of public order, commanded the two competitors to leave the town, reserving the decision of the case to a council. Eulalius having broken his ban, the emperor Honorius decided to recognize Boniface, and the council was countermanded. But the faction of Eulalius long continued to foment disorders, and the secular authority was compelled to intervene.

Boniface II., pope from 530 to 532, was by birth a Goth, and owed his election to the nomination of his predecessor, Felix IV., and to the influence of the Gothic king. The Roman electors had opposed to him a priest of Alexandria called Dioscorus, who died a month after his election, and thus left the position open for him. Boniface endeavoured to nominate his own successor, thus transforming into law, or at least into custom, the proceeding by which he had benefited; but the clergy and the senate of Rome forced him to cancel this arrangement.

Boniface III. was pope from the 15th of February to the 12th of November 606. He obtained from Phocas

recognition of the “headship of the church at Rome,” which signifies, no doubt, that Phocas compelled the patriarch of Constantinople to abandon (momentarily) his claim to the title of oecumenical patriarch.

Boniface IV. was pope from 608 to 615. He received from the emperor Phocas the Pantheon at Rome, which was converted into a Christian church.

Boniface V., pope from 619 to 625, did much for the christianizing of England. Bede mentions (*Hist. Eccl.*) that he wrote encouraging letters to Mellitus, archbishop of Canterbury, and Justus, bishop of Rochester, and quotes three letters—to Justus, to Eadwin, king of Northumbria, and to his wife Æthelberga. William of Malmesbury gives a letter to Justus of the year 625, in which Canterbury is constituted the metropolitan see of Britain for ever.

Boniface VI. was elected pope in April 896, and died fifteen days afterwards.

Boniface VII. was pope from August 984 to July 985. His family name was Franco. In 974 he was substituted by Crescentius and the Roman barons for Benedict VI., who had been assassinated. He was ejected by Count Sicco, the representative of the emperor Otto II., and fled to Constantinople. On the death of Otto (983) he returned, seized Pope John XIV., threw him into prison, and installed himself in his place.

(L. D.*)

Boniface VIII. (Benedetto Gaetano), pope from 1294 to 1303, was born of noble family at Anagni, studied canon and civil law in Italy and possibly at Paris. After being appointed to canonicates at Todi (June 1260) and in France, he became an advocate and then a notary at the papal court. With Cardinal Ottoboni, who was to aid the English king, Henry III., against the bishops of the baronial party, he was besieged in the Tower of London by the rebellious earl of Gloucester, but was rescued by the future Edward I., on the 27th of April 1267. Created cardinal deacon in 1281, and in 1291 cardinal priest (SS. Sylvestri et Martini), he was entrusted with many diplomatic missions and became very influential in the Sacred College. He helped the ineffective Celestine V. to abdicate, and was himself chosen pope at Naples on the 24th of December 1294. Contrary to custom, the election was not made unanimous, probably because of the hostility of certain French cardinals. Celestine attempted to rule in extreme monastic poverty and humility; not so Boniface, who ardently asserted the lordship of the papacy over all the kingdoms of the world. He was crowned at Rome in January 1295 with great pomp. He planned to pacify the West and then recover the Holy Land from the infidel; but during his nine years’ reign, so far from being a peacemaker, he involved the papacy itself in a series of controversies with leading European powers. Avarice, lofty claims and frequent exhibitions of arrogance made him many foes. The policy of supporting the interests of the house of Anjou in Sicily proved a grand failure. The attempt to build up great estates for his family made most of the Colonna his enemies. Until 1303 he refused to recognize Albert of Austria as the rightful German king. Assuming that he was overlord of Hungary, he declared that its crown should fall to the house of Anjou. He humbled Eric VI. of Denmark, but was unsuccessful in the attempt to try Edward I., the conqueror of Scotland, on the charge of interfering with a papal fief; for parliament declared in 1301 that Scotland had never been a fief of Rome. The most noted conflict of Boniface was that with Philip IV. of France. In 1296, by the bull *Clericis laicos*, the pope forbade the levying of taxes, however disguised, on the clergy without his consent. Forced to recede from this position, Boniface canonized Louis IX. (1297). The hostilities were later renewed; in 1302 Boniface himself drafted and published the indubitably genuine bull *Unam sanctam*, one of the strongest official statements of the papal prerogative ever made. The weight of opinion now tends to deny that any part of this much-discussed document save the last sentence bears the marks of an infallible utterance. The French vice-chancellor Guillaume de Nogaret was sent to arrest the pope, against whom grave charges had been brought, and bring him to France to be deposed by an oecumenical council. The accusation of heresy has usually been dismissed as a slander; but recent investigations make it probable, though not quite certain, that Boniface privately held certain Averroistic tenets, such as the denial of the immortality of the soul. With Sciarra Colonna, Nogaret surprised Boniface at Anagni, on the 7th of September 1303, as the latter was about to pronounce the sentence of excommunication against the king. After a nine-hours’ truce the palace was stormed, and Boniface was found lying in his bed, a cross clasped to his breast; that he was sitting in full regalia on the papal throne is a legend. Nogaret claimed that he saved the pope’s life from the vengeful Colonna. Threatened, but not maltreated, the pope had remained three days under arrest when the citizens of Anagni freed him. He was conducted to Rome, only to be confined in the Vatican by the Orsini. He died on the 11th or 12th of October 1303, not eighty-six years old, as has commonly been believed, but perhaps under seventy, at all events not over seventy-five. “He shall come in like a fox, reign like a lion, die like a dog,” is a gibe wrongly held to be a prophecy of his unfortunate predecessor. Dante, who had become embittered against Boniface while on a political mission in Rome, calls him the “Prince of the new Pharisees” (*Inferno*, 27, 85), but laments that “in his Vicar Christ was made a captive,” and was “mocked a second time” (*Purgatory*, 20, 87 f.).

Authorities.—Digard, Faucon and Thomas, *Les Registres de Boniface VIII* (Paris, 1884 ff.); Wetzer and Welte, *Kirchenlexikon*, vol. ii. (2nd ed., Freiburg, 1883), 1037-1062; Herzog-Hauck, *Realencyklopadie*, vol. iii. (3rd ed., Leipzig, 1897), 291-300, contains an elaborate bibliography; J. Loserth, *Geschichte des spateren Mittelalters* (Munich, 1903), 206-232; H. Finke, *Aus den Tagen Bonifaz VIII.* (Münster, 1902) is dreary but epoch-making; *Göttingische gelehrte Anzeigen*, Jahrgang 166, 857-869 (Berlin, 1904); R. Scholz, *Die Publizistik zur Zeit Philipps des Schönen und Bonifaz VIII.* (Stuttgart, 1903); K. Wenck, “War Bonifaz VIII. ein Ketzer?” in von Sybel’s *Historische Zeitschrift*, vol. xciv. (Munich, 1905), 1-66. Special literature on *Unam Sanctum*: C. Mirbt, *Quellen zur Geschichte des Papsttums* (2nd ed., Tübingen, 1901), 148 f.; *Kirchenlexikon*, xii. (1901), 229-240, an exhaustive discussion; H. Finke, 146-190; J.H. Robinson, *Readings in European History*, vol. i. (Boston, 1904), 346 ff. On *Clericis laicos*: Gee and Hardy, *Documents Illustrative of English Church History* (London, 1896), 87 ff.

(W. W. R.*)

Boniface IX. (Piero Tomacelli), pope from 1389 to 1404, was born at Naples of a poor but ancient family. Created cardinal by Urban VI., he was elected successor to the latter on the 2nd of November 1389. In 1391 he canonized Birgitta of Sweden. He was able to restore Roman authority in the major part of the papal states, and in 1398 put an end to the republican liberties of the city itself. Boniface won Naples, which had owed spiritual allegiance to the antipopes Clement VII. and Benedict XIII. of Avignon, to the Roman obedience. In 1403 he ventured at last to confirm the deposition of the emperor Wenceslaus and the election of Rupert. Negotiations for the healing of the Great Schism were without result. In spite of his inferior education, the contemporaries of

Boniface trusted his prudence and moral character; yet when in financial straits he sold offices, and in 1399 transformed the annates into a permanent tax. In 1390 he celebrated the regular jubilee, but a rather informal one held in 1400 proved more profitable. Though probably not personally avaricious, he was justly accused of nepotism. He died on the 1st of October 1404, being still under sixty years of age.

(W. W. R.*)

BONIFACE OF SAVOY (d. 1270), archbishop of Canterbury, became primate in 1243, through the favour of Henry III., of whose queen, Eleanor of Provence, he was an uncle. Boniface, though a man of violent temper and too often absent from his see, showed some sympathy with the reforming party in the English church. Though in 1250 he provoked the English bishops by claiming the right of visitation in their dioceses, he took the lead at the council of Merton (1258) in vindicating the privileges of his order. In the barons' war he took the royalist side, but did not distinguish himself by great activity.

See Matthew Paris, *Chronica Majora*; François Mugnier, *Les Savoyards en Angleterre* (Chambéry, 1890).

BONIFACIO, a maritime town at the southern extremity of Corsica, in the arrondissement of Sartène, 87 m. S.S.E. of Ajaccio by road. Pop. (1906) 2940. Bonifacio, which overlooks the straits of that name separating Corsica from Sardinia, occupies a remarkable situation on the summit of a peninsula of white calcareous rock, extending parallel to the coast and enclosing a narrow and secure harbour. Below the town and in the cliffs facing it the rock is hollowed into caverns accessible only by boat. St Dominic, a church built in the 13th century by the Templars, and the cathedral of Santa Maria Maggiore which belongs mainly to the 12th century, are the chief buildings. The fortifications and citadel date from the 16th and 17th centuries. A massive medieval tower serves as a powder-magazine. The trade of Bonifacio, which is carried on chiefly with Sardinia, is in cereals, wine, cork and olive-oil of fine quality. Cork-cutting, tobacco-manufacture and coral-fishing are carried on. The olive is largely cultivated in the neighbourhood and there are oil-works in the town.

Bonifacio was founded about 828 by the Tuscan marquis whose name it bears, as a defence against the Saracen pirates. At the end of the 11th century it became subject to Pisa, and at the end of the 12th was taken and colonized by the Genoese, whose influence may be traced in the character of the population. In 1420 it heroically withstood a protracted siege by Alphonso V. of Aragon. In 1554 it fell into the hands of the Franco-Turkish army.

BONIFACIUS (d. 432), the Roman governor of the province of Africa who is generally believed to have invited the Vandals into that province in revenge for the hostile action of Placidia, ruling in behalf of her son the emperor Valentinian III. (428-429). That action is by Procopius attributed to his rival Aëtius, but the earliest authorities speak of a certain Felix, chief minister of Placidia, as the calumniator of Bonifacius. Whether he really invited the Vandals or not, there is no doubt that he soon turned against them and bravely defended the city of Hippo from their attacks. In 432 he returned to Italy, was received into favour by Placidia, and appointed master of the soldiery. Aëtius, however, resented his promotion, the two rivals met, perhaps in single combat, and Bonifacius, though victorious, received a wound from the effects of which he died three months later.

The authorities for the extremely obscure and difficult history of these transactions are well discussed by E.A. Freeman in an article in the *English Historical Review*, July 1887, to which the reader is referred. But compare also Gibbon, *Decline and Fall of the Roman Empire*, vol. iii. pp. 505-506, edited by J.B. Bury (London, 1897).

BONIN ISLANDS, called by the Japanese Ogasawara-Jima, a chain of small islands belonging to Japan, stretching nearly due north and south, a little east of 142 E., and from 26° 35′ to 27° 45′ N., about 500 m. from the mainland of Japan. They number twenty, according to Japanese investigations, and have a coast-line of 174.65 m. and a superficies of 28.82 sq. m. Only ten of them have any appreciable size, and these are named—commencing from the north—Muko-shima (Bridegroom Island), Nakadachi-shima (Go-between Island[1]), Yome-shima (Bride Island), Ototo-jima (Younger-brother Island), Ani-shima (Elder-brother Island), Chichi-jima (Father Island), Haha-jima (Mother Island), Mei-jima (Niece Island), Ani-jima (Elder-sister Island) and Imoto-jima (Younger-sister Island). European geographers have been accustomed to divide the islands into three groups for purposes of nomenclature, calling the northern group the Parry Islands, the central the Beechey Islands and the southern the Coffin or Bailey Islands. The second largest of all, Chichi-jima, in Japanese cartography was called Peel Island in 1827 by Captain Beechey, and the same officer gave the name of Stapleton Island to the Ototo-jima of the Japanese, and that of Buckland Island to their Ani-jima. To complete this account of Captain Beechey's nomenclature, it may be added that he called a large bay on the south of Peel Island Fitton Bay, and a bay on the south-west of Buckland Island Walker Bay.[2] Port Lloyd, the chief anchorage (situated on Peel

Island), is considered by Commodore Perry—who visited the islands in 1853 and strongly urged the establishment of a United States coaling station there—to have been formerly the crater of a volcano from which the surrounding hills were thrown up, the entrance to the harbour being a fissure through which lava used to pour into the sea. The islands are, indeed, plainly volcanic in their nature.

History.—The diversity of nomenclature indicated above suggests that the ownership of the islands was for some time doubtful. According to Japanese annals they were discovered towards the close of the 16th century, and added to the fief of a Daimyo, Ogasawa Sadayori, whence the name Ogasawara-jima. They were also called *Bunin-jima* (corrupted by foreigners into Bonin) because of their being without (*bu*) inhabitants (*nin*). Effective occupation did not take place, however, and communications with the islands ceased altogether in 1635, as was a natural consequence of the Japanese government's veto against the construction of sea-going vessels. In 1728 fitful communication was restored by the then representative of the Ogasawara family, only to be again interrupted until 1861, when an unsuccessful attempt was made to establish a Japanese colony at Port Lloyd. Meanwhile, Captain Beechey visited the islands in the "Blossom," assigned names to some of them, and published a description of their features. Next a small party consisting of two British subjects, two American citizens, and a Dane, sailed from the Sandwich Islands for Port Lloyd in 1830, taking with them some Hawaiian natives. These colonists hoisted the British flag on Peel Island (Chichi-jima), and settled there. When Commodore Perry arrived in 1853, there were on Peel Island thirty-one inhabitants, four being English, four American, one Portuguese and the rest natives of the Sandwich Islands, the Ladrones, &c.; and when Mr Russell Robertson visited the place in 1875, the colony had grown to sixty-nine, of whom only five were pure whites. Mr Robertson found them without education, without religion, without laws and without any system of government, but living comfortably on clearings of cultivated land. English was the language of the settlers, and they regarded themselves as a British colony. But in 1861 the British government renounced all claim to the islands in recognition of Japan's right of possession. There is now regular steam communication; the affairs of the islands are duly administered, and the population has grown to about 4500. There are no mountains of any considerable height in the Ogasawara Islands, but the scenery is hilly with occasional bold crags. The vegetation is almost tropically luxuriant—palms, wild pineapples, and ferns growing profusely, and the valleys being filled with wild beans and patches of taro. Mr Robertson catalogues a number of valuable timbers that are obtained there, among them being Tremana, cedar, rose-wood, iron-wood (red and white), box-wood, sandal and white oak. The kekop tree, the orange, the laurel, the juniper, the wild cactus, the curry plant, wild sage and celery flourish. No minerals have been discovered. The shores are covered with coral; earthquakes and tidal waves are frequent, the latter not taking the form of bores, but of a sudden steady rise and equally sudden fall in the level of the sea; the climate is rather tropical than temperate, but sickness is almost unknown among the residents.

(F. By.)

1 Referring to the Japanese custom of employing a go-between to arrange a marriage.

2 These details are taken from *The Bonin Islands* by Russell Robertson, formerly H.B.M. consul in Yokohama, who visited the islands in 1875.

BONITZ, HERMANN (1814-1888), German scholar, was born at Langensalza in Saxony on the 29th of July 1814. Having studied at Leipzig under G. Hermann and at Berlin under Böckh and Lachmann, he became successively teacher at the Blochmann institute in Dresden (1836), Oberlehrer at the Friedrich-Wilhelms gymnasium (1838) and the Graues Kloster (1840) in Berlin, professor at the gymnasium at Stettin (1842), professor at the university of Vienna (1849), member of the imperial academy (1854), member of the council of education (1864), and director of the Graues Kloster gymnasium (1867). He retired in 1888, and died on the 25th of July in that year at Berlin. He took great interest in higher education, and was chiefly responsible for the system of teaching and examination in use in the high schools of Prussia after 1882. But it is as a commentator on Plato and Aristotle that he is best known outside Germany. His most important works in this connexion are: *Disputationes Platonicae Duae* (1837); *Platonische Studien* (3rd ed., 1886); *Observations Criticae in Aristotelis Libros Metaphysicos* (1842); *Observationes Criticae in Aristotelis quae feruntur Magna Moralia et Ethica Eudemia* (1844); *Alexandri Aphrodisiensis Commentarius in Libras Metaphysicos Aristotelis* (1847); *Aristotelis Metaphysica* (1848-1849); *Über die Kategorien des A.* (1853); *Aristotelische Studien* (1862-1867); *Index Aristotelicus* (1870). Other works: *Über den Ursprung der homerischen Gedichte* (5th ed., 1881); *Beiträge zur Erklärung des Thukydides* (1854), *des Sophokles* (1856-1857). He also wrote largely on classical and educational subjects, mainly for the *Zeitschrift für die österreichischen Gymnasien*.

A full list of his writings is given in the obituary notice by T. Gompertz in the *Biographisches Jahrbuch für Altertumskunde* (1890).

BONIVARD, FRANÇOIS (1493-1570), the hero of Byron's poem, *The Prisoner of Chillon*, was born at Seyssel of an old Savoyard family. Bonivard has been described as "a man of the Renaissance who had strayed into the age of the Reformation." His real character and history are, however, widely different from the legendary account which was popularized by Byron. In 1510 he succeeded his uncle, who had educated him, as prior of the Cluniac priory of St Victor, close to Geneva. He naturally, therefore, opposed the attempts of the duke of Savoy, aided by his relative, the bishop of the city, to maintain his rights as lord of Geneva. He was imprisoned by the duke at Gex from 1519 to 1521, lost his priory, and became more and more anti-Savoyard. In 1530 he was again seized by the duke and imprisoned for four years underground, in the castle of Chillon, till he was

released in 1536 by the Bernese, who then wrested Vaud from the duke. He had been imprisoned for political reasons, for he did not become a Protestant till after his release, and then found that his priory had been destroyed in 1534. He obtained a pension from Geneva, and was four times married, but owing to his extravagances was always in debt. He was officially entrusted in 1542 with the task of compiling a history of Geneva from the earliest times. In 1551 his MS. of the *Chroniques de Genève* (ending in 1530) was submitted to Calvin for correction, but it was not published till 1831. The best edition is that of 1867. The work is uncritical and partial, but is his best title to fame.

BONN, a town of Germany, in the Prussian Rhine province, on the left bank of the Rhine, 15 m. S. by E. from Cologne, on the main line of railway to Mainz, and at the junction of the lines to the Eifel and (by ferry) to the right bank of the Rhine. Pop. (1885) 35,989; (1905) 81,997. The river is here crossed by a fine bridge (1896-1898), 1417 ft. in length, flanked by an embankment 2 m. long, above and parallel with which is the Coblenzer-strasse, with beautiful villas and pretty gardens reaching down to the Rhine. The central part of the town is composed of narrow streets, but the outskirts contain numerous fine buildings, and the appearance of the town from the river is attractive. There are six Roman Catholic and two Protestant churches, the most important of which is the Münster (minster), an imposing edifice of grey stone, in the Romanesque and Transition styles, surmounted by five towers, of which the central, rising to a height of 315 ft., is a landmark in the Rhine valley. The church dates from the 11th, 12th and 13th centuries, was restored in 1875 and following years and in 1890-1894 was adorned with paintings. Among other churches are the Stiftskirche (monasterial church), rebuilt 1879-1884; the Jesuitenkirche (1693); the Minoritenkirche (1278-1318), the Herz Jesu-kirche (1862) and the Marienkirche (1892). There is also a synagogue, and the university chapel serves as an English church. The town also possesses a town hall situate on the market square and dating from 1737, a fine block of law-court buildings, several high-grade schools and a theatre.

By far the finest of the buildings, however, is the famous university, which occupies the larger part of the southern frontage of the town. The present establishment only dates from 1818, and owes its existence to King Frederick William III. of Prussia; but as early as 1786 the academy which had been founded about nine years before was raised by Archbishop Maximilian Frederick of Cologne to the rank of a university, and continued to exercise its functions till 1794, when it was dissolved by the last elector. The building now occupied by the university was originally the electoral palace, constructed about 1717 out of the materials of the old fortifications. It was remodelled after the town came into Prussian possession. There are five faculties in the university—a legal, a medical, and a philosophic, and one of Roman Catholic and another Protestant theology. The library numbers upwards of 230,000 volumes; and the antiquarian museum contains a valuable collection of Roman relics discovered in the neighbourhood. Connected with the university are also physiological, pathological and chemical institutes, five clinical departments and a laboratory. An academy of agriculture, with a natural history museum and botanic garden attached, is established in the palace of Clemensruhe at Poppelsdorf, which is reached by a fine avenue about a mile long, bordered on both sides by a double row of chestnut trees. A splendid observatory, long under the charge of Friedrich Wilhelm Argelander, stands on the south side of the road. The Roman Catholic archiepiscopal theological college, beautifully situated on an eminence overlooking the Rhine, dates from 1892.

Beethoven was born in Bonn, and a statue was erected to him in the Münster-platz in 1845. B.G. Niebuhr is buried in the cemetery outside of the Sterntor, where a monument was placed to his memory by Frederick William IV. Here are also the tombs of A.W. von Schlegel, the diplomatist Christian Karl von Bunsen, Robert Schumann, Karl Simrock, E.M. Arndt and Schiller’s wife. The town is adorned with a marble monument commemorating the war of 1870-71, a handsome fountain, and a statue of the Old Catholic bishop Reinkens. In 1889 a museum of Beethoven relics was opened in the house in which the composer was born. There are further a municipal museum, arranged in a private house since 1882, an academic art museum (1884), with some classic originals, a creation of F.G. Welcker, and the provincial museum, standing near the railway station, which contains a collection of medieval stone monuments and works of art, besides a small picture gallery.

One of the most conspicuous features of Bonn, viewed from the river, is the pilgrimage (monastic) church of Kreuzberg (1627), behind and above Poppelsdorf; it has a flight of 28 steps, which pilgrims used to ascend on their knees. “Der alte Zoll,” commanding a magnificent view of the Siebengebirge, is the only remaining bulwark of the old fortifications, the Sterntor having been removed in order to open up better communication with the rapidly increasing western suburbs and the terminus of the light railway to Cologne.

But for its university Bonn would be a place of comparatively little importance, its trade and commerce being of moderate dimensions. Its principal industries are jute spinning and weaving, and the manufacture of porcelain, flags, machinery and beer, and it has some trade in wine. There are considerable numbers of foreign residents, notably English, attracted by the natural beauty of the place and by the educational facilities it affords.

Bonn (*Bonna* or *Castra Bonnensia*), originally a town of the Ubii, became at an early period the site of a Roman military settlement, and as such is frequently mentioned by Tacitus. It was the scene, in A.D. 70, of a battle in which the Romans were defeated by Claudius Civilis, the valiant leader of the Batavians. Greatly reduced by successive barbarian inroads, it was restored about 359 by the emperor Julian. In the centuries that followed the break-up of the Roman empire it again suffered much from barbarian attacks, and was finally devastated in 889 by bands of Norse raiders who had sailed up the Rhine. It was again fortified by Konrad von Hochstaden, archbishop of Cologne (1238-1261), whose successor, Engelbert von Falkenburg (d. 1274), driven out of his cathedral city by the townspeople, established himself here (1265); from which time until 1794 it remained the residence of the electors of Cologne. During the various wars that devastated Germany in the 16th, 17th and 18th centuries, the town was frequently besieged and occupied by the several belligerents, but continued to belong to the electors till 1794, when the French took possession of it. At the peace of Lunéville

they were formally recognized in their occupation; but in 1815 the town was made over by the congress of Vienna to Prussia. The fortifications had been dismantled in 1717.

See F. Ritter, *Entstehung der drei ältesten Städte am Rhein: Köln, Bonn und Mainz* (Bonn, 1851); H. von Sybel, *Die Gründung der Universität Bonn* (1868); and *Führer von Hesse* (10th ed., 1901).

BONNAT, LÉON JOSEPH FLORENTIN (1833-), French painter, was born at Bayonne on the 20th of June 1833. He was educated in Spain, under Madrazo at Madrid, and his long series of portraits shows the influence of Velasquez and the Spanish realists. In 1869 he won a medal of honour at Paris, where he became one of the leading artists of his day, and in 1888 he became professor of painting at the École des Beaux Arts. In May 1905 he succeeded Paul Dubois as director. His vivid portrait-painting is his most characteristic work, but his subject pictures, such as the “Martyrdom of St Denis” in the Panthéon, are also famous.

BONNE-CARRÈRE, GUILLAUME DE (1754-1825), French diplomatist, was born at Muret in Languedoc on the 13th of February 1754. He began his career in the army, but soon entered the diplomatic service under Vergennes. A friend of Mirabeau and of Dumouriez, he became very active at the Revolution, and Dumouriez re-established for him the title of director-general of the department of foreign affairs (March 1792). He remained at the ministry, preserving the habits of the diplomacy of the old régime, until December 1792, when he was sent to Belgium as agent of the republic, but he was involved in the treason of Dumouriez and was arrested on the 2nd of April 1793. To justify himself, he published an account of his conduct from the beginning of the Revolution. He was freed from prison in July 1794. Napoleon did not trust him, and gave him only some unimportant missions. After 1815 Bonne-Carrère retired into private life, directing a profitable business in public carriages between Paris and Versailles.

BONNER, EDMUND (1500?-1569), bishop of London, was perhaps the natural son of George Savage, rector of Davenham, Cheshire, by Elizabeth Frodsham, who was afterwards married to Edmund Bonner, a sawyer of Hanley in Worcestershire. This account, which was printed with many circumstantial details by Strype (*Eccles. Mem.* III. i. 172-173), was disputed by Strype’s contemporary, Sir Edmund Lechmere, who asserted on not very satisfactory evidence (*ib. Annals*, I. ii. 300)that Bonner was of legitimate birth. He was educated at Broadgates Hall, now Pembroke College, Oxford, graduating bachelor of civil and canon law in June 1519. He was ordained about the same time, and admitted D.C.L. in 1525. In 1529 he was Wolsey’s chaplain, and he was with the cardinal at Cawood at the time of his arrest. Subsequently he was transferred, perhaps through Cromwell’s influence, to the service of the king, and in January 1532 he was sent to Rome to obstruct the judicial proceedings against Henry in the papal curia. In October 1533 he was entrusted with the unmannerly task of intimating to Clement VII., while he was the guest of Francis I. at Marseilles, Henry’s appeal from the pope to a general council; but there seems to be no good authority for Burnet’s story that Clement threatened to have him burnt alive. For these and other services Bonner had been rewarded by the grant of several livings, and in 1535 he was made archdeacon of Leicester.

Towards the end of that year he was sent to further what he called “the cause of the Gospel” (*Letters and Papers*, 1536, No. 469) in North Germany; and in 1536 he wrote a preface to Gardiner’s *De vera Obedientia*, which asserted the royal, denied the papal, supremacy, and was received with delight by the Lutherans. After a brief embassy to the emperor in the spring of 1538, Bonner superseded Gardiner at Paris, and began his mission by sending Cromwell a long list of accusations against his predecessor (*ib*. 1538, ii. 144). He was almost as bitter against Wyatt and Mason, whom he denounced as a “papist,” and the violence of his conduct led Francis I. to threaten him with a hundred strokes of the halberd. He seems, however, to have pleased his patron, Cromwell, and perhaps Henry, by his energy in seeing the king’s “Great” Bible in English through the press in Paris. He was already king’s chaplain; his appointment at Paris had been accompanied by promotion to the see of Hereford, and before he returned to take possession he was translated to the bishopric of London (October 1539).

Hitherto Bonner had been known as a somewhat coarse and unscrupulous tool of Cromwell, a sort of ecclesiastical Wriothesley, He is not known to have protested against any of the changes effected by his masters; he professed to be no theologian, and was wont, when asked theological questions, to refer his interrogators to the divines. He had graduated in law, and not in theology. There was nothing in the Reformation to appeal to him, except the repudiation of papal control; and he was one of those numerous Englishmen whose views were faithfully reflected in the Six Articles. He became a staunch Conservative, and, apart from his embassy to the emperor in 1524-1543, was mainly occupied during the last years of Henry’s reign in brandishing the “whip with six strings.”

The accession of Edward VI opened a fresh and more creditable chapter in Bonner’s career. Like Gardiner, he could hardly repudiate that royal supremacy, in the establishment of which he had been so active an agent; but he began to doubt that supremacy when he saw to what uses it could be put by a Protestant council, and either he or Gardiner evolved the theory that the royal supremacy was in abeyance during a royal minority. The

ground was skilfully chosen, but it was not legally nor constitutionally tenable. Both he and Gardiner had in fact sought fresh licences to exercise their ecclesiastical jurisdiction from the young king; and, if he was supreme enough to confer jurisdiction, he was supreme enough to issue the injunctions and order the visitation to which Bonner objected. Moreover, if a minority involved an abeyance of the royal supremacy in the ecclesiastical sphere, it must do the same in the temporal sphere, and there could be nothing but anarchy. It was on this question that Bonner came into conflict with Edward's government. He resisted the visitation of August 1547, and was committed to the Fleet; but he withdrew his opposition, and was released in time to take an active part against the government in the parliament of November 1547. In the next session, November 1548-March 1549, he was a leading opponent of the first Act of Uniformity and Book of Common Prayer. When these became law, he neglected to enforce them, and on the 1st of September 1549 he was required by the council to maintain at St Paul's Cross that the royal authority was as great as if the king were forty years of age. He failed to comply, and after a seven days' trial he was deprived of his bishopric by an ecclesiastical court over which Cranmer presided, and was sent to the Marshalsea. The fall of Somerset in the following month raised Bonner's hopes, and he appealed from Cranmer to the council. After a struggle the Protestant faction gained the upper hand, and on the 7th of February 1550 Bonner's deprivation was confirmed by the council sitting in the Star Chamber, and he was further condemned to perpetual imprisonment.

He was released by Mary's accession, and was at once restored to his see, his deprivation being regarded as invalid and Ridley as an intruder. He vigorously restored Roman Catholicism in his diocese, made no difficulty about submitting to the papal jurisdiction which he had forsworn, and in 1555 began the persecution to which he owes his fame. His apologists explain that his action was merely "official," but Bonner was one of those who brought it to pass that the condemnation of heretics to the fire should be part of his ordinary official duties. The enforcement of the first Book of Common Prayer had also been part of his official duties; and the fact that Bonner made no such protest against the burning of heretics as he had done in the former case shows that he found it the more congenial duty. Tunstal was as good a Catholic as Bonner; he left a different repute behind him, a clear enough indication of a difference in their deeds.

On the other hand, Bonner did not go out of his way to persecute; many of his victims were forced upon him by the council, which sometimes thought that he had not been severe enough (see *Acts of the P.C. 1554-1556*, pp. 115, 139; *1556-1558*, pp. 18, 19, 216, 276). So completely had the state dominated the church that religious persecutions had become state persecutions, and Bonner was acting as an ecclesiastical sheriff in the most refractory district of the realm. Even Foxe records instances in which Bonner failed to persecute. But he had no mercy for a fallen foe; and he is seen at his worst in his brutal jeers at Cranmer, when he was entrusted with the duty of degrading his former chief. It is a more remarkable fact that, in spite of his prominence, neither Henry VIII. nor Mary should ever have admitted him to the privy council. He seems to have been regarded by his own party as a useful instrument, especially in disagreeable work, rather than as a desirable colleague.

On her accession Elizabeth refused to allow him to kiss her hand; but he sat and voted in the parliament and convocation of 1559. In May he refused to take the oath of supremacy, acquiring like his colleagues consistency with old age. He was sent to the Marshalsea, and a few years later was indicted on a charge of praemunire on refusing the oath when tendered him by his diocesan, Bishop Horne of Winchester. He challenged the legality of Horne's consecration, and a special act of parliament was passed to meet the point, while the charge against Bonner was withdrawn. He died in the Marshalsea on the 5th of September 1569, and was buried in St George's, Southwark, at midnight to avoid the risk of a hostile demonstration.

See *Letters and Papers of Henry VIII.* vols. iv.-xx.; *Acts of the Privy Council* (1542-1569); *Lords' Journals*, vol. i.; Wilkins' *Concilia*; Foxe's *Acts and Monuments*, ed. Townsend; Burnet, ed. Pocock; Strype's Works; Gough's *Index to Parker Soc. Publ.*; S.R. Maitland's *Essays on the Ref.*; Froude's and R.W. Dixon's *Histories*; Pollard's *Cranmer* and *England under Somerset*; other authorities cited in *Dict. Nat. Biogr.*

(A. F. P.)

BONNET, CHARLES (1720-1793), Swiss naturalist and philosophical writer, was born at Geneva on the 13th of March 1720, of a French family driven into Switzerland by the religious persecution in the 16th century. He made law his profession, but his favourite pursuit was the study of natural science. The account of the ant-lion in N.A. Pluche's *Spectacle de la nature*, which he read in his sixteenth year, turned his attention to insect life. He procured R.A.F. de Réaumur's work on insects, and with the help of live specimens succeeded in adding many observations to those of Réaumur and Pluche. In 1740 Bonnet communicated to the academy of sciences a paper containing a series of experiments establishing what is now termed parthenogenesis in *aphides* or tree-lice, which obtained for him the honour of being admitted a corresponding member of the academy. In 1741 he began to study reproduction by fusion and the regeneration of lost parts in the freshwater hydra and other animals; and in the following year he discovered that the respiration of caterpillars and butterflies is performed by pores, to which the name of *stigmata* has since been given. In 1743 he was admitted a fellow of the Royal Society; and in the same year he became a doctor of laws—his last act in connexion with a profession which had ever been distasteful to him.

His first published work appeared in 1745, entitled *Traité d'insectologie*, in which were collected his various discoveries regarding insects, along with a preface on the development of germs and the scale of organized beings. Botany, particularly the leaves of plants, next attracted his attention; and after several years of diligent study, rendered irksome by the increasing weakness of his eyesight, he published in 1754 one of the most original and interesting of his works, *Recherches sur l'usage des feuilles dans les plantes*; in which among other things he advances many considerations tending to show (as has quite recently been done by Francis Darwin) that plants are endowed with powers of sensation and discernment. But Bonnet's eyesight, which threatened to fail altogether, caused him to turn to philosophy. In 1754 his *Essai de psychologie* was published anonymously in London. This was followed by the *Essai analytique sur les facultés de l'âme* (Copenhagen, 1760), in which he develops his views regarding the physiological conditions of mental activity. He returned to physical science, but to the speculative side of it, in his *Considérations sur les corps organisés* (Amsterdam, 1762), designed to

refute the theory of epigenesis, and to explain and defend the doctrine of pre-existent germs. In his *Contemplation de la nature* (Amsterdam, 1764-1765; translated into Italian, German, English and Dutch), one of his most popular and delightful works, he sets forth, in eloquent language, the theory that all the beings in nature form a gradual scale rising from lowest to highest, without any break in its continuity. His last important work was the *Palingénésie philosophique* (Geneva, 1769-1770); in it he treats of the past and future of living beings, and supports the idea of the survival of all animals, and the perfecting of their faculties in a future state.

Bonnet's life was uneventful. He seems never to have left Switzerland, nor does he appear to have taken any part in public affairs except for the period between 1752 and 1768, during which he was a member of the council of the republic. The last twenty five years of his life he spent quietly in the country, at Genthod, near Geneva, where he died after a long and painful illness on the 20th of May 1793. His wife was a lady of the family of De la Rive.

They had no children, but Madame Bonnet's nephew, the celebrated H.B. de Saussure, was brought up as their son.

Bonnet's philosophical system may be outlined as follows. Man is a compound of two distinct substances, mind and body, the one immaterial and the other material. All knowledge originates in sensations; sensations follow (whether as physical effects or merely as sequents Bonnet will not say) vibrations in the nerves appropriate to each; and lastly, the nerves are made to vibrate by external physical stimulus. A nerve once set in motion by a particular object tends to reproduce that motion; so that when it a second time receives an impression from the same object it vibrates with less resistance. The sensation accompanying this increased flexibility in the nerve is, according to Bonnet, the condition of memory. When reflection—that is, the active element in mind—is applied to the acquisition and combination of sensations, those abstract ideas are formed which, though generally distinguished from, are thus merely sensations in combination only. That which puts the mind into activity is pleasure or pain; happiness is the end of human existence. Bonnet's metaphysical theory is based on two principles borrowed from Leibnitz—first, that there are not successive acts of creation, but that the universe is completed by the single original act of the divine will, and thereafter moves on by its own inherent force; and secondly, that there is no break in the continuity of existence. The divine Being originally created a multitude of germs in a graduated scale, each with an inherent power of self-development. At every successive step in the progress of the universe, these germs, as progressively modified, advance nearer to perfection; if some advanced and others did not there would be a gap in the continuity of the chain. Thus not man only but all other forms of existence are immortal. Nor is man's mind alone immortal; his body also will pass into the higher stage, not, indeed, the body he now possesses, but a finer one of which the germ at present exists within him. It is impossible, however, to reach absolute perfection, because the distance is infinite. In this final proposition Bonnet violates his own principle of continuity, by postulating an interval between the highest created being and the Divine. It is also difficult to understand whether the constant advance to perfection is performed by each individual, or only by each race of beings as a whole. There seems, in fact, to be an oscillation between two distinct but analogous doctrines—that of the constantly increasing advancement of the individual in future stages of existence, and that of the constantly increasing advancement of the race as a whole according to the successive evolutions of the globe.

Bonnet's complete works appeared at Neuchâtel in 1779-1783, partly revised by himself. An English translation of certain portions of the *Palingénésie philosophique* was published in 1787, under the title, *Philosophical and Critical Inquiries concerning Christianity*. See also A. Lemoine, *Charles Bonnet* (Paris, 1850); the duc de Caraman, *Charles Bonnet, philosophe et naturaliste* (Paris, 1859); Max Offner, *Die Psychologie C. B.* (Leipzig, 1893); Joh. Speck, in *Arch. f. Gesch. d. Philos.* x. (1897), xi. (1897), pp. 58 foll., xi. (1898) pp. 1-211; J. Trembley, *Vie privée et littéraire de C. B.* (Bern, 1794).

BONNET (from Lat. *bonetum*, a kind of stuff, then the cap made of this stuff), originally a soft cap or covering for the head, the common term in English till the end of the 17th century; this sense survives in Scotland, especially as applied to the cap known as a "glengarry." The "bonnet" of a ship's sail now means an additional piece laced on to the bottom, but it seems to have formerly meant a piece laced to the top, the term "to vail the bonnet" being found at the beginning of the 16th century to mean "strike sail" (from the Fr. *avaler*), to let down. In modern times "bonnet" has come to be used of a type of head-covering for women, differentiated from "hat" by fitting closely to the head and often having no brim, but varying considerably in shape according to the period and fashion. The term, by a natural extension, is also applied to certain protective devices, as in a steam-engine or safety-lamp, or in slang use to a gambler's accomplice, a decoy.

BONNEVAL, CLAUDE ALÉXANDRE, Comte de (1675-1747), French adventurer, known also as Ahmed Pasha, was the descendant of an old family of Limousin. He was born on the 14th of July 1675, and at the age of thirteen joined the Royal Marine Corps. After three years he entered the army, in which he rose to the command of a regiment. He served in the Italian campaigns under Catinat, Villeroi and Vendôme, and in the Netherlands under Luxemburg, giving proofs of indomitable courage and great military ability. His insolent bearing towards the minister of war was made matter for a court-martial (1704). He was condemned to death, but saved himself by flight to Germany. Through the influence of Prince Eugene he obtained a general's command in the Austrian army, and fought with great bravery and distinction against France, and afterwards against Turkey. He was present at Malplaquet, and was severely wounded at Peterwardein. The proceedings against him in France were then allowed to drop, and he visited Paris, and married a daughter of Marshal de Biron. He returned, however, after a short time to the Austrian army, and fought with distinction at Belgrade.

He might now have risen to the highest rank, had he not made himself disagreeable to Prince Eugene, who sent him as master of the ordnance to the Low Countries. There his ungovernable temper led him into a quarrel with the marquis de Prié, Eugene's deputy governor in the Netherlands, who answered his challenge by placing him in confinement. A court-martial was again held upon him, and he was condemned to death; but the emperor commuted the sentence to one year's imprisonment and banishment. Bonneval, soon after his release, offered his services to the Turkish government, professed the Mahommedan faith, and took the name of Ahmed. He was made a pasha, and appointed to organize and command the artillery. He rendered valuable services to the sultan in his war with Russia, and with the famous Nadir Shah. As a reward he received the governorship of Chios, but he soon fell under the suspicion of the Porte, and was banished for a time to the shores of the Black Sea. He was meditating a return to Europe and Christianity when he died at Constantinople on the 23rd of March 1747.

The *Memoirs* published under his name are spurious. See Prince de Ligne, *Mémoire sur le comte de Bonneval* (Paris, 1817); and A. Vandal, *Le Pacha Bonneval* (Paris, 1885).

BONNEVILLE, BENJAMIN L. E. (1795-1878), American military engineer and explorer, was born in France about 1795. He emigrated to the United States in early youth, and graduated at the United States Military Academy at West Point in 1815. He was engaged in the construction of military roads in the south-west, and became a captain of infantry in 1825. In 1831-1836, having obtained leave of absence from the army, he conducted, largely on his own responsibility, an exploring expedition to the Rocky Mountains, proceeding up the Platte river through parts of the later states of Colorado and Wyoming into the Great Salt Lake basin and thence into California. After being absolutely cut off from civilization for several years, and having his name struck from the army list, he returned with an interesting and valuable account of his adventures, which was edited and amplified by Washington Irving and published under the title *The Rocky Mountains: or Scenes, Incidents, and Adventures in the Far West; from the Journal of Captain Benjamin L.E. Bonneville of the Army of the United States* (2 vols., 1837), subsequent editions bearing the title *The Adventures of Captain Bonneville, U.S.A., in the Rocky Mountains and the Far West.* Bonneville became a major in 1845, and was breveted lieutenant-colonel for gallantry in the battles of Contreras and Churubusco during the Mexican War. He became a colonel in 1855, commanded the Gila river expedition against the Apaches in 1857, and from 1858 to 1861 commanded the department of New Mexico. He was retired in 1861, but served during the Civil War as recruiting officer and commandant of barracks at St Louis, Missouri, receiving the brevet rank of brigadier-general in 1865. He died at Fort Smith, Arkansas, on the 12th of June 1878. The extinct glacial lake which once covered what is now north-western Utah has been named in his honour.

BONNEY, THOMAS GEORGE (1833-), English geologist, eldest son of the Rev. Thomas Bonney, master of the grammar school at Rugeley, was born in that town on the 27th of July 1833. Educated at Uppingham and St John's College, Cambridge, he graduated as 12th wrangler in 1856, and was ordained in the following year. From 1856 to 1861 he was mathematical master at Westminster school, and geology was pursued by him only as a recreation, mainly in Alpine regions. In 1868 he was appointed tutor at St John's College and lecturer in geology. His attention was specially directed to the study of the igneous and metamorphic rocks in Alpine regions and in various parts of England, in the Lizard, at Salcombe, in Charnwood Forest, in Wales and the Scottish Highlands. In 1877 he was chosen professor of geology in University College, London. He became secretary and afterwards president of the Geological Society (1884-1886), secretary of the British Association (1881-1885), president of the Mineralogical Society and of the Alpine Club. He was also in 1887 appointed honorary canon of Manchester. His purely scientific works are: *Cambridgeshire Geology* (1875); *The Story of our Planet* (1893); *Charles Lyell and Modern Geology* (1895); *Ice Work, Past and Present* (1896); *Volcanoes* (1899). In addition to many papers published in the *Quarterly Journal of the Geological Society* and *Geological Magazine*, he wrote several popular works on Alpine Regions, on English and Welsh scenery, as well as on theological subjects.

See *Geological Magazine* for September 1901 (with bibliography).

BONNIER, ANGE ELISABETH LOUIS ANTOINE (1749-1799), French diplomatist, was a member of the Legislative Assembly and of the Convention, where he voted with the majority. During the Directory he was charged with diplomatic missions, first to Lille and then to the congress of Rastadt (October 1797), where the negotiations dragged wearily along and were finally broken. On the 28th of April 1799 the plenipotentiaries on leaving Rastadt were assailed at the gates of the town by Hungarian hussars, probably charged to secure their papers. Bonnier and one of his colleagues, Claude Roberjot, were killed. The other, Jean Debry, was wounded.

See Huefer, *Der Rastadtergesandtenmord* (Bonn, 1896).

BONNIVET, GUILLAUME GOUFFIER, Seigneur de (*c.* 1488-1525), French soldier, was the younger brother of Artus Gouffier, seigneur de Boisy, tutor of Francis I. of France. Bonnivet was brought up with Francis, and after the young king's accession he became one of the most powerful of the royal favourites. In 1515 he was made admiral of France. In the imperial election of 1519 he superintended the candidature of Francis, and spent vast sums of money in his efforts to secure the votes of the electors, but without success. He was the implacable enemy of the constable de Bourbon and contributed to his downfall. In command of the army of Navarre in 1521, he occupied Fuenterrabia and was probably responsible for its non-restoration and for the consequent renewal of hostilities. He succeeded Marshal Lautrec in 1523 in the command of the army of Italy and entered the Milanese, but was defeated and forced to effect a disastrous retreat, in which the chevalier Bayard perished. He was one of the principal commanders of the army which Francis led into Italy at the end of 1524, and died at the battle of Pavia on the 24th of February 1525. Brantôme says that it was at Bonnivet's suggestion that the battle of Pavia was fought, and that, seeing the disaster he had caused, he courted and found death heroically in the fight. In spite of his failures as a general and diplomatist, his handsome face and brilliant wit enabled him to retain throughout his life the intimacy and confidence of his king. He was a man of licentious life. According to Brantôme he was the successful rival of the king for the favours of Madame de Châteaubriand, and if we may believe him to have been—as is very probable—the hero of the fourth story of the *Heptameron*, Marguerite d'Angoulême had occasion to resist his importunities.

Authorities.—Bonnivet's correspondence in the Bibliothèque Nationale, Paris; memoirs of the time; complete works of Brantôme, vol. iii., published by Ludovic Lalanne for the Société de l'Histoire de France (1864 seq.). See also Ernest Lavisse, *Histoire de France*, vol. v., by H. Lemonnier (1903-1904).

BONOMI, GIUSEPPI (1739-1808), English architect, was born at Rome on the 19th of January 1739. After attaining a considerable reputation in Italy, he came in 1767 to England, and finally settled in practice there. He was the innocent cause of the retirement of Sir Joshua Reynolds from the presidency of the Royal Academy. Sir Joshua wished him to become a full Academician, regarding him as a fitting occupant of the then vacant chair of perspective. But the majority of the Academicians were opposed to this suggestion, and Bonomi was elected an associate only, and that merely by the president's casting vote. Bonomi was largely responsible for the revival of classical architecture in England. His most famous work was the Italian villa at Roseneath, Dumbartonshire, designed for the duke of Argyll. In 1804 he was appointed honorary architect to St Peter's at Rome. He died in London on the 9th of March 1808.

His son, Giuseppi Bonomi (1796-1878), studied art in London at the Royal Academy, and became a sculptor, but is best known as an illustrator of the leading Egyptological publications of his day. From 1824 to 1832 he was in Egypt, making drawings of the monuments in the company of Burton, Lane and Wilkinson. In 1833 he visited the mosque of Omar, returning with detailed drawings, and from 1842 to 1844 was again in Egypt, attached to the Prussian government exploration expedition under Lepsius. He assisted in the arrangement of the Egyptian court at the Crystal Palace in 1853, and in 1861 was appointed curator of the Soane Museum. He died on the 3rd of March 1878.

BONONCINI (or Buononcini), **GIOVANNI BATTISTA** (1672?-1750?), Italian musical composer, was the son of the composer Giovanni Maria Bononcini, best known as the author of a treatise entitled *Il Musico Prattico* (Bologna, 1673), and brother of the composer Marc' Antonio Bononcini, with whom he has often been confused. He is said to have been born at Modena in 1672, but the date of his birth must probably be placed some ten years earlier. He was a pupil of his father and of Colonna, and produced his first operas, *Tullo Ostilio* and *Serse*, at Rome in 1694. In 1696 he was at the court of Berlin, and between 1700 and 1720 divided his time between Vienna and Italy. In 1720 he was summoned to London by the Royal Academy of Music, and produced several operas, enjoying the protection of the Marlborough family. About 1731 it was discovered that he had a few years previously palmed off a madrigal by Lotti as his own work, and after a long correspondence he was obliged to leave the country. He remained for several years in France, and in 1748 was summoned to Vienna to compose music in honour of the peace of Aix-la-Chapelle. He then went to Venice as a composer of operas, and nothing more is known of his life.

Bononcini's rivalry with Handel will always ensure him immortality, but he was in himself a musician of considerable merit, and seems to have influenced the style, not only of Handel but even of Alessandro Scarlatti. Either he or his brother (our knowledge of the two composers' lives is at present not sufficient to distinguish their works clearly) was the inventor of that sharply rhythmical style conspicuous in *Il Trionfo di Camilla* (1697), the success of which at Naples probably induced Scarlatti to adopt a similar type of melody. It is noticeable in the once popular air of Bononcini, *L'esperto nocchiero*, and in the air *Vado ben spesso*, long attributed to Salvator Rosa, but really by Bononcini.

BONONIA (mod. *Bologna*), the chief town of ancient Aemilia (see Aemilia, Via), in Italy. It was said by classical writers to be of Etruscan origin, and to have been founded, under the name Felsina, from Perusia by Aucnus or Ocnus. Excavations of recent years have, however, led to the discovery of some 600 ancient Italic (Ligurian?)

huts, and of cemeteries of the same and the succeeding (Umbrian) periods (800-600? B.C.), of which the latter immediately preceded the Etruscan civilization (*c.* 600-400 B.C.). An extensive Etruscan necropolis, too, was discovered on the site of the modern cemetery (A. Zannoni, *Scavi della Certosa*, Bologna, 1876), and others in the public garden and on the Arnoaldi Veli property (*Notizie degli Scavi, indice* 1876-1900, *s.v.* "Bologna"). In 196 B.C., when the town first appears in history, it was already in the possession of the Boii, and had probably by this time changed its name, and in 189 B.C. it became a Roman colony. After the conquest of the mountain tribes, its importance was assured by its position on the Via Aemilia, by which it was connected in 187 B.C. with Ariminum and Placentia, and on the road, constructed in the same year, to Arretium; while another road was made, perhaps in 175 B.C., to Aquilelia. It thus became the centre of the road system of north Italy. In 90 B.C. it acquired Roman citizenship. In 43 B.C. it was used as his base of operations against Decius Brutus by Mark Antony, who settled colonists here; Augustus added others later, constructing a new aqueduct from the Letta, a tributary of the Rhenus, which was restored to use in 1881 (G. Gozzadini in *Notizie degli Scavi*, 1881, 162). After a fire in A.D. 53 the emperor Claudius made a subvention of 10 million sesterces (£1,087,500). Bononia seems, in fact, to have been one of the most important cities of ancient Italy, as Bologna is of modern Italy. It was able to resist Alaric in 410 and to preserve its existence during the general ruin. It afterwards belonged to the Greek exarchate of Ravenna. Of remains of the Roman period, however, there are none above ground, though various discoveries have been made from time to time within the city walls, the modern streets corresponding more or less, as it seems, with the ancient lines. Remains of the bridge of the Via Aemilia over the Rhenus have also been found— consisting of parts of the parapets on each side, in brick-faced concrete which belong to a restoration, the original construction (probably by Augustus in 2 B.C.) having been in blocks of Veronese red marble—and also of a massive protecting wall slightly above it, of late date, in the construction of which a large number of Roman tombstones were used. The bed of the river was found to have risen at least 20 ft. since the collapse of this bridge (about A.D. 1000), the total length of which must have been about 650 ft. and the width between the parapets 38½ ft.

See E. Brizio in *Notizie degli Scavi* (1896), 125, 450; (1897) 330; (1898) 465; (1902) 532.

(T. As.)

BONPLAND, AIMÉ JACQUES ALEXANDRE (1773-1858), French traveller and botanist, whose real name was GOUJAND, was born at La Rochelle on the 22nd of August 1773. After serving as a surgeon in the French army and studying under J.N. Corvisart at Paris, he accompanied A. von Humboldt during five years of travel in Mexico, Colombia and the districts bordering on the Orinoco and Amazon. In these explorations he collected and classified about 6000 plants till then mostly unknown in Europe, which he afterwards described in *Plantes équinoxiales*, &c. (Paris, 1808-1816). On returning to Paris he received a pension and the superintendence of the gardens at Malmaison, and published *Monographie des Mélastomées* (1806), and *Description des plantes rares de Navarre* (1813). In 1816 he set out, taking with him various European plants, for Buenos Aires, where he was elected professor of natural history, an office which he soon quitted in order to explore central South America. While journeying to Bolivia he was arrested in 1821, by command of Dr Francia, the dictator of Paraguay, who detained him until 1831. On regaining liberty he resided at San Borga in the province of Corrientes, until his removal in 1853 to Santa Anna, where he died on the 4th of May 1858.

BONSTETTEN, CHARLES VICTOR DE (1745-1832), Swiss writer, an excellent type of a liberal patrician, more French than Swiss, and a good representative of the Gallicized Bern of the 18th century. By birth a member of one of the great patrician families of Bern, he was educated in his native town, at Yverdon, and (1763-1766) at Geneva, where he came under the influence of Rousseau and of Charles Bonnet, and imbibed liberal sentiments. Recalled to Bern by his father, he was soon sent to Leiden, and then visited (1769) England, where he became a friend of the poet Gray. After his father's death (1770) he made a long journey in Italy, and on his return to Bern (1774) entered political life, for which he was unfitted by reason of his liberal ideas, which led him to patronize and encourage Johannes Müller, the future Swiss historian. In 1779 he was named the Bernese bailiff of Saanen or Gessenay (here he wrote his *Lettres pastorales sur une contrée de la Suisse*, published in German in 1781), and in 1787 was transferred in a similar capacity to Nyon, from which post he had to retire after taking part (1791) in a festival to celebrate the destruction of the Bastille. From 1795 to 1797 he governed (for the Swiss Confederation) the Italian-speaking districts of Lugano, Locarno, Mendrisio and Val Maggia, of which he published (1797) a pleasing description, and into which he is said to have introduced the cultivation of the potato. The French revolution of 1798 in Switzerland drove him again into private life. He spent the years 1798 to 1801 in Denmark, with his friend Fredirika Brun, and then settled down in 1803 in Geneva for the rest of his life. There he enjoyed the society of many distinguished persons, among whom was (1809-1817) Madame de Staël. It was during this period that he published his most celebrated work, *L'Homme du midi et l'homme du nord* (1824), a study of the influence of climate on different nations, the north being exalted at the expense of the south. Among his other works are the *Recherches sur la nature et les lois de l'imagination* (1807), and the *Études de l'homme, ou Recherches sur les facultés de penser et de sentir* (1821), but he was better as an observer than as a philosopher.

Lives by A. Steinlen (Lausanne, 1860), by C. Morell (Winterthur, 1861), and by R. Willy (Bern, 1898). See also vol. xiv. of Sainte-Beuve's *Causeries du Lundi*.

(W. A. B. C.)

BONUS (a jocular application of the Lat. *bonus*, for *bonum*, “a good thing”), a sum paid to shareholders in a joint-stock company, as an addition to the ordinary dividend, and generally given out of accumulated profits, or out of profits gained from exceptional transactions. As used by insurance companies, the word denotes the addition made to the amount of a policy by a distribution *pro rata* of accumulated profits or surplus. In a more general sense, bonus is any payment or remuneration over and above what is due and promised.

BONZE (from Japanese *bonzo*, probably a mispronunciation of Chinese *fan sung*, “religious person”), the European name for the members of the Buddhist religious orders of Japan and China. The word is loosely used of all the Buddhist priests in those and the neighbouring countries.

BOOK, the common name for any literary production of some bulk, now applied particularly to a printed composition forming a volume, or, if in more than one volume, a single organic literary work. The word is also used descriptively for the internal divisions or sections of a comprehensive work.

The word “book” is found with variations of form and gender in all the Teutonic languages, the original form postulated for it being a strong feminine *Bôks*, which must have been used in the sense of a writing-tablet. The most obvious connexion of this is with the old English *bóc*, a beech tree, and though this is not free from philological difficulties, no probable alternative has been suggested.

As early as 2400 B.C., in Babylonia, legal decisions, revenue accounts, &c. were inscribed in cuneiform characters on clay tablets and placed in jars, arranged on shelves and labelled by clay tablets attached by straws. In the 7th century B.C. a library of literary works written on such tablets existed at Nineveh, founded by Sargan (721-705 B.C.). As in the case of the “Creation” series at the British Museum the narrative was sometimes continued from one tablet to another, and some of the tablets are inscribed with entries forming a catalogue of the library. These clay tablets are perhaps entitled to be called books, but they are out of the direct ancestry of the modern printed book with which we are here chiefly concerned. One of the earliest direct ancestors of this extant is a roll of eighteen columns in Egyptian hieratic writing of about the 25th century B.C. in the Musée de Louvre at Paris, preserving the maxims of Ptah-hetep. Papyrus, the material on which the manuscript (known as the Papyrus Prisse) is written, was made from the pith of a reed chiefly found in Egypt, and is believed to have been in use as a writing material as early as about 4000 B.C. It continued to be the usual vehicle of writing until the early centuries of the Christian era, was used for pontifical bulls until A.D. 1022, and occasionally even later; while in Coptic manuscripts, for which its use had been revived in the 7th century, it was employed as late as about A.D. 1250. It was from the name by which they called the papyrus, βύβλος or βίβλος, that the Greeks formed βιβλίον, their word for a book, the plural of which (mistaken for a feminine singular) has given us our own word Bible. In the 2nd century B.C. Eumenes II., king of Pergamus, finding papyrus hard to procure, introduced improvements into the preparations of the skins of sheep and calves for writing purposes, and was rewarded by the name of his kingdom being preserved in the word *pergamentum*, whence our “parchment,” by which the dressed material is known. In the 10th century the supremacy which parchment had gradually established was attacked by the introduction from the East of a new writing material made from a pulp of linen rags, and the name of the vanquished papyrus was transferred to this new rival. Paper-mills were set up in Europe in the 12th century, and the use of paper gained ground, though not very rapidly, until on the invention of printing, the demand for a cheap material for books, and the ease with which paper could be worked on a press, gave it a practical monopoly. This it preserved until nearly the end of the 19th century, when substances mainly composed of wood-pulp, esparto grass and clay largely took its place, while continuing, as in the transition from papyrus to linen-pulp, to pass under the same name (see PAPER).

So long as the use of papyrus was predominant the usual form of a book was that of the *volumen* or roll, wound round a stick, or sticks. The modern form of book, called by the Latins *codex* (a word originally used for the stump of a tree, or block of wood, and thence for the three-leaved tablets into which the block was sawn) was coming into fashion in Martial’s time at Rome, and gained ground in proportion as parchment superseded papyrus. The *volumen* as it was unrolled revealed a series of narrow columns of writing, and the influence of this arrangement is seen in the number of columns in the earliest codices. Thus in the Codex Sinaiticus and Codex Vaticanus of the Bible, both of the 4th century, there are respectively four and three columns to a page; in the Codex Alexandrinus (5th century) only two; in the Codex Bezae (6th century) only one, and from this date to the invention of printing, while there were great changes in handwriting, the arrangement of books changed very little, single or double columns being used as was found convenient. In the external form of books there was much the same conservatism. In the Codex Amiatinus written in England in the 8th century one of the miniatures shows a book in a red leather cover, and the arrangement of the pattern on this curiously resembles that of the 15th-century red leather bindings predominant in the Biblioteca Laurenziana at Florence, in which the codex itself is preserved. In the same way some of the small stamps used in Oxford bindings in the 15th century are nearly indistinguishable from those used in England three centuries earlier. Much fuller details as to the history of written books in these as well as other respects will be found in the article MANUSCRIPT, to which the following account of the fortunes of books after the invention of printing must be regarded as supplementary.

Between a manuscript written in a formal book-hand and an early printed copy of the same work, printed in the same district as the manuscript had been written, the difference in general appearance was very slight. The printer’s type (see TYPOGRAPHY) would as a rule be based on a handwriting considered by the scribes appropriate to works of the same class; the chapter headings, headlines, initial-letters, paragraph marks, and in some cases

illustrations, would be added by hand in a style which might closely resemble the like decorations in the manuscript from which the text was being printed; there would be no title-page, and very probably no statement of any kind that the book was printed, or as to where, when or by whom it was produced. Information as to these points, if given at all, was reserved for a paragraph at the end of the book, called by bibliographers a colophon (*q.v.*), to which the printer often attached a device consisting of his arms, or those of the town in which he worked, or a fanciful design. These devices are sometimes beautiful and often take the place of a statement of the printer's name. Many facsimiles or copies of them have been published.[1] The first dated title-page known[2] is a nine-line paragraph on an otherwise blank page giving the title of the book, *Sermo ad populum predicabilis in festo presentacionis Beatissime Marie Semper Virginis*, with some words in its praise, the date 1470 in roman numerals, and a reference to further information on the next page. The book in which this title-page occurs was printed by Arnold ther Hoernen at Cologne. Six years later Erhard Ratdolt and his partners at Venice printed their names and the date, together with some verses describing the book, on the title-page of a Latin calendar, and surrounded the whole with a border in four pieces. For another twenty years, however, when title-pages were used at all, they usually consisted merely of the short title of the book, with sometimes a woodcut or the printer's (subsequently the publisher's) device beneath it, decoration being more often bestowed on the first page of text, which was sometimes surrounded by an ornamental border. Title-pages completed by the addition of the name and address of printer or publisher, and also by the date, did not become common till about 1520.

While the development of the title-page was thus slow the completion of the book, independently of handwork, in other respects was fairly rapid. Printed illustrations appear first in the form of rude woodcuts in some small books produced at Bamberg by Albrecht Pfister about 1461. Pagination and headlines were first used by ther Hoernen at Cologne in 1470 and 1471; printed signatures to guide binders in arranging the quires correctly (see Bibliography and Bibliology) by Johann Koelhoff, also at Cologne in 1472. Illustrations abound in the books printed at Augsburg in the early 'seventies, and in the 'eighties are common in Germany, France and the Low Countries, while in Italy their full development dated from about 1490. Experiments were made in both Italy and France with illustrations engraved on copper, but in the 15th century these met with no success.

Bound with wooden boards covered with stamped leather, or with half of the boards left uncovered, many of the earliest printed books are immensely large and heavy, especially the great choir-books, the Bibles and the Biblical and legal commentaries, in which a great mass of notes surrounds the text. The paper on which these large books were printed was also extraordinarily thick and strong. For more popular books small folio was at first a favourite size, but towards the end of the century small thin quartos were much in vogue. Psalters, books of hours, and other prayer-books were practically the only very small books in use. Owing to changes, not only in the value of money but in the coinage, the cost of books in the 15th century is extremely difficult to ascertain. A vellum copy of the first printed Bible (Mainz, c. 1455) in two large folio volumes, when rubricated and illuminated, is said to have been worth 100 florins. In 1467 the bishop of Aleria writing to Pope Paul II. speaks of the introduction of printing having reduced prices to one-fifth of what they had previously been. Fifteen "Legends" bequeathed by Caxton to St Margaret's, Westminster, were sold at prices varying from 6s. 8d. to 5s. This would be cheap for a large work like the *Golden Legend*, but the bequest was more probably of copies of the Sarum *Legenda*, or Lectionary, a much smaller book.

16th Century.—The popularization of the small octavo by Aldus at Venice in 1501 and the introduction in these handy books of a new type, the italic, had far-reaching consequences. Italics grew steadily in favour during the greater part of the century, and about 1570 had almost become the standard vernacular type of Italy. In France also they were very popular, the attempt to introduce a rival French cursive type (*lettres de civilité*) attaining no success. In England they gained only slight popularity, but roman type, which had not been used at all in the 15th century, made steady progress in its contest with black letter, which by the end of the century was little used save for Bibles and proclamations. The modern practice in the use of i and j, u and v dates from about 1580, though not firmly established till the reign of Charles I.

In the second quarter of the 16th century the French printers at Paris and Lyons halved the size of the Aldine octavos in their small sextodecimos, which found a ready market, though not a lasting one, the printers of Antwerp and Leiden ousting them with still smaller books in 24mo or small twelves. These little books were printed on paper much thinner than had previously been used. The size and weight of books was also reduced by the substitution of pasteboards for wooden sides. Gold tooling came into use on bindings, and in the second half of the century very elaborate decoration was in vogue in France until checked by a sumptuary law. On the other hand a steady decline in the quality of paper combined with the abandonment of the old simple outline woodcuts for much more ambitious designs made it increasingly difficult for printers to do justice to the artists' work, and woodcuts, at first in the Low Countries and afterwards in England and elsewhere, were gradually superseded by copper-plates printed separately from the text. At the beginning of this century in England a ballad or Christmas carol sold for a halfpenny and thin quarto chapbooks for 4d. (a price which lasted through the century), the Great Bible of 1541 was priced at 10s. in sheets and 12s. bound, Edward VI.'s prayer-book (1549) at 2s. 2d. unbound, and 3s. 8d. in paste or boards; Sidney's *Arcadia* and other works in 1598 sold for 9s.

17th Century.—Although the miniature editions issued by the Elzevirs at Leiden, especially those published about 1635, have attracted collectors, printing in the 17th century was at its worst, reaching its lowest depths in England in the second quarter. After this there was a steady improvement, partly due to slight modifications of the old printing presses, adopted first in Holland and copied by the English printers. In the first half of the century many English books, although poorly printed, were ornamented with attractive frontispieces, or portraits, engraved on copper. During the same period, English prayer-books and small Bibles and New Testaments were frequently covered with gay embroideries in coloured silks and gold or silver thread. In the second half of the century the leather bindings of Samuel Mearne, to some extent imitated from those of the great French binder Le Gascon, were the daintiest England had yet produced. For trade bindings rough calf and sheepskin were most used, and the practice of lettering books on the back, instead of on the sides or fore-edges or not at all, came gradually into favour. Owing to the increase of money, and in some cases to the action of monopolists, in others to the increased payments made to authors, book-prices rather rose than fell. Thus church Bibles, which had been sold at 10s. in 1541, rose successively to 25s., 30s. and (in 1641) to 40s. Single plays in quarto cost 6d. each in Shakespeare's time, 1s. after the Restoration. The Shakespeare folio of 1623 is said to have been published at £1. Bishop Walton's polyglot Bible in six large volumes was sold for £10 to

subscribers, but resulted in a heavy loss. Izaak Walton's *Compleat Angler* was priced at 1s. 6d. in sheepskin, *Paradise Lost* at 3s., *The Pilgrim's Progress* at 1s. 6d.; Dryden's *Virgil* was published by subscription at £5:5s. It was a handsome book, ornamented with plates; but in the case of this and other subscription books a desire to honour or befriend the author was mainly responsible for the high price.

18th Century.—During this century there was a notable improvement alike in paper, type and presswork in both France and England, and towards the end of the century in Germany and Italy also. Books became generally neat and sometimes elegant. Book-illustration revived with the French *livres-à-vignettes*, and English books were illustrated by Gravelot and other French artists. In the last quarter of the century the work of Bewick heralded a great revival in woodcut illustrations, or as the use of the graver now entitled them to be called, wood engravings. The best 18th-century binders, until the advent of Roger Payne, were inferior to those of the 17th century, but the technique of the average work was better. In trade bindings the use of sheepskin and calf became much less common, and books were mostly cased in paper boards. The practice of publishing poetry by subscription at a very high price, which Dryden had found lucrative, was followed by Prior and Pope. Single poems by Pope, however, were sold at 1s. and 1s. 6d. Novels were mostly in several volumes. The price at the beginning of the century was mostly 1s. 6d. each. It then remained fairly steady for many years, and at the close of the century rose again. Thus Miss Burney's *Evelina* (3 vols., 1778) sold for 7s. 5d., her *Cecilia* (5 vols., 1782) for 12s. 6d., and her *Camilla* (5 vols., 1796) for £1:1s. Johnson's *Dictionary* (2 vols. folio, 1755) cost £4 : 4s. in sheets, £4 : 15s. in boards.

19th Century.—great change in the appearance of books was caused by the use first of glazed calico (about 1820), afterwards (about 1830) of cloth for the cases of books as issued by their publishers. At first the lettering was printed on paper labels, but soon it was stamped in gilt on the cloth, and in the last quarter of the century many very beautiful covers were designed for English and American books. The designs for leather bindings were for many years chiefly imitated from older work, but towards the end of the 'eighties much greater originality began to be shown. Book illustrations passed through many phases. As subsidiary methods colour-prints, line engravings, lithographs and etchings were all used during the first half of the century, but the main reliance was on wood-engraving, in which extraordinary technical skill was developed. In the 'sixties and the years which immediately preceded and followed them many of the chief English artists supplied the engravers with drawings. In the last decade of the century wood-engraving was practically killed by the perfection attained by photographic methods of reproduction (see PROCESS), the most popular of these methods entailing the use of paper heavily coated with china clay. During the century trade-printing, both in England and America, steadily improved, and the work done by William Morris at his Kelmscott Press (1891-1896), and by other amateur printers who imitated him, set a new standard of beauty of type and ornament, and of richness of general effect. On the other hand the demand for cheap reprints of famous works induced by the immense extension of the reading public was supplied by scores of pretty if flimsy editions at 1s. 6d. and 1s. and even less. The problem of how to produce books at moderate prices on good paper and well sewn, was left for the 20th century to settle. About 1894 the number of such medium-priced books was greatly increased in England by the substitution of single-volume novels at 6s. each (subject to discount) for the three-volume editions at 31s. 6d. The preposterous price of 10s. 6d. a volume had been adopted during the first popularity of the *Waverly Novels*, and despite the example of France, where the standard price was 3 fr. 50, had continued in force for the greater part of the century. Even after novels were sold at reasonable rates artificial prices were maintained for books of travel and biographies, so that the circulating libraries were practically the only customers for the first editions. (See PUBLISHING and BOOKSELLING).

(A. W. PO.)

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1 Works especially devoted to these facsimiles are:—Berjeau's *Early Dutch, German and English Printers' Marks* (London, 1866); W. Roberts's *Printers' Marks* (London, 1893); Silvestre's *Marques typographiques* (French; Paris, 1853-1867); *Die Büchermarken oder Buchdrucker und Verlegerzeichen* (Strassburg, 1892-1898), the successive parts containing the devices used in Alsace, Italy, Basel, Frankfort, Mainz and Cologne; and *Marques typographiques des imprimeurs et libraires qui ont exercé dans les Pays-Bas* (Gand, 1894). Numerous devices are also reproduced in histories of printing and in volumes of facsimiles of early types.

2 An edition of a bull of Pope Pius II. in the John Rylands library, Manchester, in types used by Fust and Schoeffer at Mainz, bears printed on the top of the first page the words "Dis ist die bul zu dutsch die unser allerheiligster vatter der bapst Pius herusgesant hait widder die snoden ungleubigen turcken." This is attributed to the year 1463, and is claimed as the first book with a printed title-page.

BOOKBINDING. Bindings or covers to protect written or printed matter have always followed the shapes of the material on which the writing or printing was done. Very early inscriptions on rocks or wood needed no coverings, and the earliest instances of protective covers are to be found among the smaller Assyrian tablets of about the 8th century B.C. These tablets, with cuneiform inscriptions recording sales of slaves, loans of money and small matters generally, are often enclosed in an outer shell of the same shape and impressed with a short title. Egyptian papyrus rolls were generally kept in roll form, bound round with papyrus tape and often sealed with seals of Nile mud; and the rolls in turn were often preserved in rectangular hollows cut in wood. The next earliest material to papyrus used for writing upon was tree bark. Bark books, still commonly used by uncultured nations, often consisting of collections of magical formulae or medical receipts, are generally rolls, folded backwards and forwards upon themselves like the sides of a concertina. At Pompeii in 1875 several diptychs were found, the wooden leaves hollowed on the inner sides, filled with blackened wax, and hinged together at the back with leather thongs. Writings were found scratched on the wax, one of them being a record of a payment to Umbricia Januaria in A.D. 55. This is the earliest known Latin manuscript. The diptychs are the prototypes of the modern book. From about the 1st to the 6th century, ornamental diptychs were made of carved ivory, and presented to great personages by the Roman consuls.

Origins.

FIG. 1.—WINCHESTER DOMESDAY BOOK OF THE 12TH CENTURY.
Dark brown morocco, blind stamped.

FIG. 2.—ST. CUTHBERT'S GOSPELS.
Red leather with repoussé design, probably the work of the 7th or 8th century. The fine lines are impressed by hand, and painted blue and yellow.

FIG. 4.—BINDING MADE FOR JAMES I.
Dark blue morocco, gold tooled. The red in the coat-of-arms inlaid with red morocco.

FIG. 3.—BINDING MADE FOR JEAN GROLIER.
Pale brown morocco, gold tooled.

FIG. 5.—COMMON PRAYER (LONDON, 1678).
Smooth red morocco, gold tooled with black fillets. Bound by Samuel Mearne.

FIG. 6.—LE LIVRE DES STATUTS ET ORDONNANCES DE L'ORDRE DU BENVIST SAINCT ESPRIT (PARIS, 1578).
Brown morocco, gold tooled, arms of Henry III., King of France. Bound by Nicholas Eve.

FIG. 7.—CATALOGUE OF THE PICTURES AT HAGLEY HALL.
Red niger morocco, gold tooled. Bound by Douglas Cockerell.

FIG. 8.-WALTON'S COMPLEAT ANGLER (1772).
Golden brown morocco, gold tooled. Bound by Miss E.M. MacColl.

Rolls of papyrus, vellum or paper were written upon in three ways, (1) In short lines, at right angles to the length of the roll. (2) In long lines each the entire length of the roll. (3) In short lines parallel to the length of the roll, each column or page of writing having a space left on each side of it. Rolls written in the first of these ways were simply rolled up and kept in cylinders of like shape, sometimes several together, with a title tag at the end of each, in a box called a scrinium. In the case of the second form, the most obvious instances of which are to be found in the Buddhist prayer-wheels, the rolls were and are kept in circular boxes with handles through the centres so that they can revolve easily. In the third manner of arranging the manuscript the page forms show very clearly, and it is still used in the scrolls of the law in Jewish synagogues, kept on two rollers, one at each end. But this form of writing also developed a new method for its own more convenient preservation. A roll of this kind can be folded up, backwards and forwards, the bend coming in the vacant spaces between the columns of writing. When this is done it at once becomes a book, and takes the Chinese and Japanese form known as *orihon*—all the writing on one side of the roll or strip of paper and all the other side blank. Some books of this kind are simply guarded by two boards, but generally they are fastened together along one of the sides, which then becomes the back of the book. The earliest fastening of such books consists of a lacing with some cord or fibre run through holes stabbed right through the substance of the roll, near the

edge. Now the *orihon* is complete, and it is the link between the roll and the book. This “stabbed” form of binding is the earliest method of keeping the leaves of a book together; it occurs in the case of a Coptic papyrus of about the 8th century found at Thebes, but it is rarely used in the case of papyrus, as the material is too brittle to retain the threads properly.

The method of folding vellum into pages seems to have been first followed about the 5th century. The sheets were folded once, and gatherings of four or more folded sheets were made, so that stitches through the fold at the back would hold all the sheets together and each leaf could be conveniently turned over. Very soon an obvious plan of fixing several of these gatherings, or quires, together was followed by the simple expedient of fastening the threads at the back round a strong strip of leather or vellum held at right angles to the line of the backs. This early plan of “sewing” books is to-day used in the case of valuable books; it is known as “flexible” work, and has never been improved upon.

As soon as the method of sewing quires together in this way became well understood, it was found that the projecting bands at the back needed protection, so that when all the quires were joined together and, so far, finished, strips of leather were fastened all over the back. But it was also found that vellum leaves were apt to curl strongly, and to counteract this tendency strong wooden boards were put on each side. The loose ends of the bands were fastened to the boards, which hinged upon them, and the protecting strip of leather at the back was drawn over the boards far enough to cover the hinge. So we get the medieval “half-binding” which shows the strip of leather over the back of the book, projecting for a short way over the boards, the rest of which is left uncovered. The boards were usually kept closed by means of clasps in front.

The leather strip soon developed, and covered the whole of the boards, “whole” binding as it is called, and it was quickly found that these fine flat pieces of leather offered a splendid field for artistic decoration.

Progress of artistic binding.

The first ornamentation on leather bindings was probably made by means of impressions from small metal points or lines, pressed upon the leather. This in time led to the purposeful cutting of small decorative stamps to be used in the same way. It is considered that English binders excelled in this art of “blind” stamping, that is, without the use of gold leaf. Most of the stamps were cut intaglio, so that their impressions are in cameo form. Such bindings were made to perfection during the 12th and 13th centuries at Durham, Oxford, Cambridge, London and other places. One of the most charming examples left is the binding of the Winchester Domesday Book of the 12th century (Plate, fig. 1), now belonging to the Society of Antiquaries of London.

From about the 7th to the 16th century illuminated manuscripts were held in the greatest esteem. Among them can be found not only exquisite calligraphy but exquisite miniature painting. Moreover, the gorgeousness of the illuminations inside suggested gorgeousness of the outside coverings, so we find splendid work in metals with jewels, enamels and carved ivory, dating from the 7th-century *Gospels of Theodolinda* at Monza, the Irish cumdach of the *Stowe Missal*, the *Lindau Gospels* now in America, and the *Gospels of Charlemagne* in the Victoria and Albert Museum at South Kensington, to the magnificent bindings of 14th-century Limoges enamel in the British Museum. Such English bindings of this kind—intrinsically precious—as may have existed have all disappeared,—most likely they were melted up by Henry VIII. or Edward VI.; but at Stonyhurst there is a book known as *St Cuthbert’s Gospels*, which is bound in red leather with a repoussé design upon it, and is probably the work of the 7th or 8th century (Plate, fig. 2).

When printing was introduced into Europe about the middle of the 15th century, there was very soon a reaction against the large, beautiful and valuable illuminated MSS. and their equally precious covers. Printing brought small books, cheap books, ugly books, generally bound in calf, goatskin or sheepskin, and ornamented with large panel stamps in blind. But a new art came into birth very shortly, namely the art of gold tooling on leather, which in capable hands is almost a great art, and specimens of the work of the few great masters that have practised it are now much sought after and likely to increase in estimation and value. All this, as usual, brings a school of skilled *faussaires* into the field, and already the collector of fine bindings must be wary, or he may easily give thousands of pounds for forged or made-up objects that are worth but little.

In the matter of leather bindings with gold tooling, an art which was probably brought to Venice from the East, the finest examples are to be found in late 15th-century Italian work. The art quickly spread, and Thomas Berthelet, Royal Binder to Henry VIII., seems to have been the first binder who practised it in England. Berthelet’s work is strongly Italian in feeling, especially at first, and it is likely that he was taught the new art by an Italian master; he worked until about 1558.

During the late 15th and the 16th century in England, numbers of fine printed books were bound in velvet and satin, sometimes set with enamels, sometimes embroidered. These books, having strong threads of metal freely used upon them, have lasted much better than would be expected, and instances of such work made for Henry VIII. are still in excellent condition, and most decorative.

The fashion of ornamenting English royal books with heraldic designs, which is considered to have begun in the reign of Edward IV., has continued without break. The same fashion in books belonging to private owners was first followed during the later Tudor period, and then numbers were made, and have been, more or less, ever since.

During the whole Tudor period several small bindings of gold ornamented with enamels were made. Some of these still exist, and they are charming little jewels. They were always provided with a ring at the top, no doubt for attaching to the girdle.

Aldus Manutius, the great Venetian printer, had several of his books charmingly bound in dark morocco with “Aldine” knot leaves and small dolphins both in blind and gold tooling; and Giunta, a Florentine printer, had his books bound in a similar way but without the dolphins. Many early Venetian bindings have recessed panels, made by the use of double boards, the upper of which is pierced, finished in true oriental fashion.

Jean Grolier, viscount d’Aguisy, treasurer of France in 1545, was a great collector of fine books, most of which were bound for himself, and bear upon them his legend, *Portio mea domine sit in terra viventium*, and also his name, Io Grolierii et Amicorum (Plate, fig. 3). Tommaso Maioli, an Italian collector of about the same time, used the same form of legend. Books bound for him are curiously marked with atoms of gold remaining in

the irregularities of the leather.

Demetrio Canevari, physician to Pope Urban VIII., had his books bound in dark green or deep red morocco, and upon them is a fine cameo stamp with a design of Apollo driving a chariot with one white horse and one black horse towards a mountain on which is a silver Pegasus. The stamp was coloured, but in most cases the colour has now worn off. Round the stamp is the legend ΟΡΘΩΣ ΚΑΙ ΜΗ ΛΟΞΙΩΣ.

The Italian bindings which were made for popes and cardinals are always of much interest and often of high merit, but as a rule later Italian bindings are disappointing.

Geoffrey Tory, printer and engraver to Francis I. of France, designed some fine bindings, some for himself and quite possibly some for Jean Grolier.

For Henry II. of France much highly decorative work in binding was done, richly gilded and coloured. These bindings have upon them the king's initials, the initials of his queen, Catherine de' Medici, and the emblems of crescents and bows. Henry's device was a crescent with the legend, *Donec impleat totum orbem*. Bindings of similar style were made for Diane de Poitiers, duchesse de Valentinois, with her initials and the same devices of crescents and bows. They are always fine work.

German bindings are mostly in pigskin, finely stamped in blind. Several are, however, in calf. Gilding, when it exists, is generally bad.

In England during the 17th century much fine work was done in binding, most of it in morocco, but Henry, prince of Wales, always had his books bound in calf. The Jacobean style is heraldic, with semis of small stamps and heavy corners, but James I. has left some very fine bindings in another style (Plate, fig. 4), very possibly done for him by John Gibson, who bound the royal books while James was king of Scotland only. During the reign of Charles I. Nicholas Ferrar founded his curious establishment at Little Gidding, and there his niece Mary Collet and her sisters set up a bindery. They made large scrap-books, harmonies of the Gospels and other parts of the Bible, with illustrations, and bound them magnificently in velvet stamped in gold and silver. They were taught by a binder who worked for John and Thomas Buck, printers to the university of Cambridge, and the Little Gidding stamps are often identical with Buck's.

Samuel Mearne (d. 1683) was royal binder to Charles II., and invented the cottage style of decoration, a style which has lasted till the present day; the Bible on which Edward VII. took the coronation oath was ornamented in that way. An inner rectangle is run parallel to the edges of the book, and the upper and lower lines are broken outwards into the outline of a gable roof. Mearne's work as a binder (Plate, fig. 5) is of the highest merit. Many of his books have their fore-edge painted in such a way that the work is invisible when the book is shut, and only shows when the edges are fanned out.

In France 16th- and 17th-century binding is distinguished by the work of such masters as Nicholas Eve, who bound the beautiful *Livre des Statuts et Ordonnances de l'ordre du Benvist Sainct Esprit* for Henry III. (Plate, fig. 6); Clovis Eve, who is credited with the invention of the style known as "fanfare," a delicate tracery over the boards of a book, filled out with spirals of leafy stems; and Le Gascon, who invented the dotted work which has been used more or less ever since. Le Gascon caused his small gilding tools—curves and arabesques—to be scored across, so that when impressions were made from them a dotted line showed instead of a right line. Florimond Badier worked in a style very similar to that of Le Gascon and sometimes signed his work, which Le Gascon never did. Le Gascon had many imitators, the best and closest being Poncyn and Magnus, Dutch binders who worked at Amsterdam in the 17th century, and his style has been continuously followed to the present day.

The bindings of Padeloup le Jeune often have small tickets with his name upon them; they usually have borders of lace-like gold tooling known as "dentelle" and are often inlaid. He belonged to a family of binders, all of whom were excellent workmen, and lived in the 17th and 18th centuries.

The Deromes were another of the great French families of binders; the most celebrated was Nicholas Denis, called "Le Jeune," born in 1731. He used dentelle borders resembling those of Padeloup, but with little birds interspersed among the arabesques—"dentelles à l'oiseau."

Among the many French binders of the 18th century who used delicate inlays of coloured leathers, Jean Charles le Monnier was perhaps the most skilled. He often signed his bindings in small capitals impressed in gold somewhere about the inlaid part.

Eliot and Chapman bound the library of Robert Harley, earl of Oxford, about the middle of the 18th century. The bindings are in morocco, with broad, richly gold-tooled borders, and usually a diamond-shaped centre-piece. This is known as the Harleian style.

Thomas Hollis had his books bound in fine red morocco, ornamented with small, well-cut stamps engraved by Thomas Pingo, the medallist. These stamps comprise a cap of liberty, a figure of liberty, a figure of Britannia and several smaller ones.

Towards the end of the 18th century, when binding in England was decoratively at a low level, Roger Payne, a native of Windsor, came to London and set up as a bookbinder. He was a splendid workman, and introduced richly gold-tooled corner-pieces, ornamental "doublures" or inside linings, and also invented the graining of morocco, graining it, however, in one direction only, known as the "straight grain." It is said that Payne cut his own binding tools of iron; they certainly are exquisitely made, and in many of his bindings he has put a written description of loving work he has done upon them. Payne was, unfortunately, a drunkard, but he has in spite of this rendered an immortal service to the art of bookbinding in England.

In 1785 John Edwards of Halifax patented a method of making vellum transparent, and using it as a covering over delicate paintings. He also painted pictures on the fore-edges of many of his books in the same manner as that followed by Samuel Mearne in the 17th century, so that they did not show until the book was opened. John Whitaker used calf for his bindings, but ornamented the calf in a curious way with strong acids and with prints from engraved metal plates. Both Edwards and Whitaker liked classical borders and ornaments, and their bindings are in consequence often known as "Etruscan."

The main styles used in England at the beginning of the 19th century were nothing more than distant imitations of Roger Payne. Kalthoeber, Staggemeier, Walther and Hering were all disciples of this master, but Charles Lewis worked on original lines. He developed arabesques and paid particular attention to richly gold-tooled doublures. He also used gold end papers, and the bands at the back of his bindings are often double and always broad, flat and gold-tooled. His workmanship is excellent; he worked largely for Thomas Grenville and other great collectors.

French binding of the 19th century is remarkable for wonderful technical excellence in every part. Among the most skilled of these admirable workmen and artists may be particularly mentioned Thouvenin, Bauzonnet, Lortic, Niedrée, Capé and Duru, and fortunately they generally sign their work in small gold lettering either on the back of their bindings or inside along the lower edge.

Modern methods.

Recent years have witnessed a marked revival of interest in the art of bookbinding, but modern binders have two serious difficulties to contend with. One of these is the prevalence of bad paper, overladen with clay and with wood pulp, and also the fact that many of the modern leathers are badly prepared and dangerously treated with sulphuric acid, which in time inevitably rots the fibre. The Society of Arts has appointed committees of experts to report upon both of these evils, and the published accounts of both inquiries are of much value, and it is to be hoped that the results may be beneficial. Concurrently with the revival of the artistic side of the subject, there has also arisen a remarkable development in the technical processes, owing to the invention of ingenious and delicate machinery which is capable of executing the work which had hitherto been always laboriously done by hand. The processes of folding the printed sheets, and sewing them together on bands, rounding the backs when sewn, and of making the outer cases, covering them with cloth or leather and stamping designs upon them, can now all be efficiently executed by means of machines. The saving in time and labour thus effected is very great, although it must be said that the old methods of carrying out the process of sewing and rounding the backs of books by hand labour were safer and stronger, as well as being much less liable to bruise and injure the paper. These processes unfortunately are not only slow but also necessitate highly skilled labour. Already the larger trade binders utilize machines extensively and advantageously, but exclusively high-class trade binders do not as yet materially depart from the older methods. Private binders have naturally no reason to use machines at all. Fine and delicate examples of large metal blocks or dies have been very successfully used for the decoration of covers measuring about 11½ by 8 in.

Besides the large trade binders working mainly by the help of machinery, and producing a great quantity of bound work which is not expected to last long, there also exists in London, Paris, New York and other large cities, a small class of art binders who work throughout upon the principles which have been continuously in use for first-class work ever since about the 5th century. The initial impetus to this school can be traced to William Morris, who himself made some beautiful designs for bookbindings, to be executed both in gold and in blind. Although he probably did not fully appreciate either the peculiar limitations or the possibilities of the art of gold-tooling on leather, nevertheless his genius guided him truly as to the spirit in which the designs should be conceived. The revived art soon reached its first stage of development under the guidance of Mr T.J. Cobden-Sanderson, who may fairly be considered as the founder of the modern school of design for gold-tooling on book-covers, the pre-eminence and individuality of his work in this direction being proved by the number of his imitators. Among the most successful of his pupils is Mr Douglas Cockerell, whose work (Plate, fig. 7) is distinguished by a marked originality of treatment, while it shows a scholarly appreciation of ancient methods. Mr Alfred de Sauty has succeeded in developing a new and admirable style in inlaid leathers, combined with delicate pointille work. A number of women artists, both in England and in America, have already discovered in bookbinding a fitting and lucrative field for their energies. One, Miss Sarah Prideaux, is not only skilled and original in her own work, but she has also given us much valuable literature on her subject. Miss E.M. MacColl may claim to be the inventor of the small curved gold line produced by means of a tiny wheel, for though the possibility of producing such a line in blind was known for a long time, it was rarely used. The graceful curves and lines found on Miss MacColl’s work have been designed for her by her brother, Mr D.S. MacColl (Plate, fig. 8). Miss Joanna Birkenruth recalls the highly decorative medieval binding by her use of jewels cut *en cabochon*, but set in morocco instead of gold or silver, and there are many others who are working well and earnestly at art binding with delicate skill and taste. Outside the inner circle of professional bookbinders there has grown up a new profession, that of the designer for pictorial book-covers, especially those intended to be shown in colour on cloth or paper. Among notable designers may be mentioned Lewis F. Day, A.A. Turbayne, Walter Crane and Charles Ricketts.

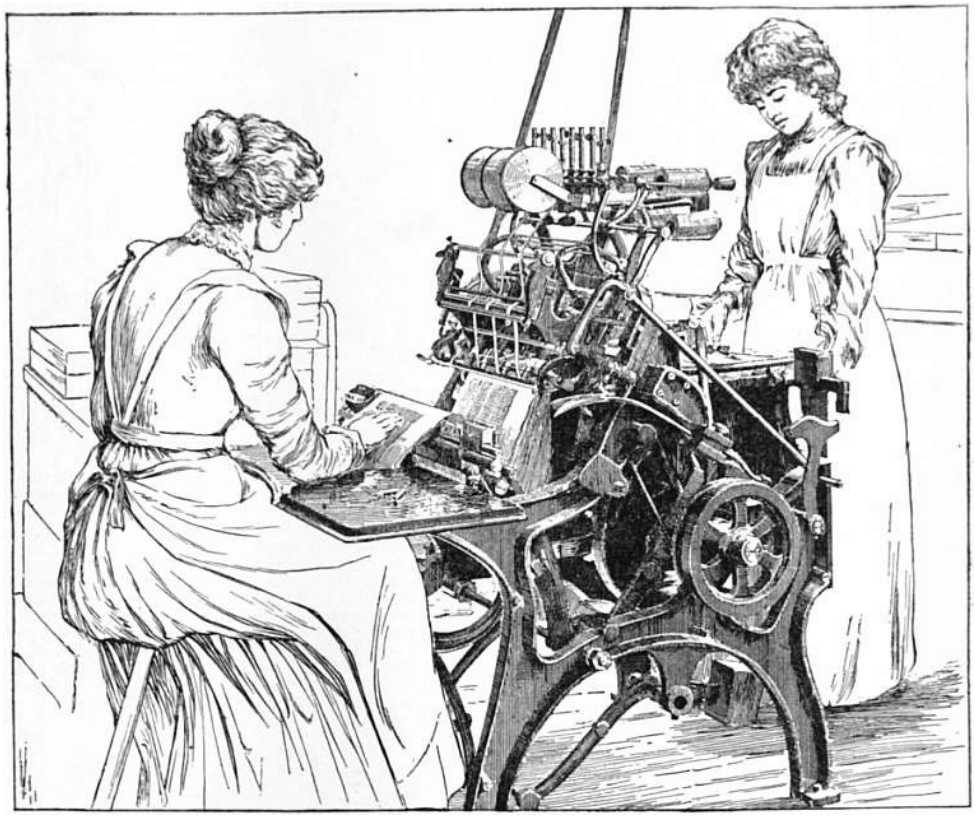

FIG. 9.—Book-sewing Machine.

Machine-binding.—The principal types of machine for commercial binding are described below. They are almost all due to American or German ingenuity. It may be noted that, while books sewn by hand on bands have the loose ends of the bands actually drawn through the boards and strongly fastened to them through their substance, no machines for covering sewn books will do this so effectively. All they will do as a rule is to paste down to the inner surfaces of the boards the loose ends of the tapes on which the sewing is done. So that, although it may last a long time if not much used, a "cased" book is likely to slip out of its cover as soon as the paste fixing it perishes. Modern bookbinding machines of all kinds are usually driven by power, and in consequence of the necessary setting of most of them accurately to some particular size of book, they are not suitable for binding books of different sizes; the full advantage of them can only be taken where there is a large edition of one book.

Sewing.

Book-sewing machines (fig. 9) are of two kinds one sews the books on bands, either flat or round, and the other supplies the place of bands by a kind of chain stitch. The band-working machines bring the return thread back by pulling it through the upper and lower edges of the back of each section, thereby to some extent weakening each section, but at the same time this weakening can be to some extent neutralized by careful head-banding. The other system, where the band is replaced by a chain stitch, brings back the return thread inside each section; the objection to this is that there is a flattening out of the back of the book, which becomes a difficulty when the subsequent operation of covering the book begins. The sections are sewn continuously in a long line, and are afterwards cut apart. The threads catch into hooked needles and are drawn through holes made by piercers set to a certain distance; a shuttle like that used in an ordinary sewing-machine sews the inner thread backwards and forwards. Each section is placed upon a sort of metal saddle by the hand of the operator, one after the other, the machine working continuously unless the action is cut off or controlled by a foot-lever or pedal. This machine is much quieter to work, and although the inner threads are too bulky to be quite satisfactory, this is not a serious matter like the cutting of the upper and lower edges of the back already described, and, moreover, is probably capable of being either improved away or so minimized that it will become of small importance.

The Martini book-sewing machine, which sews books on tape without cutting up head or tail—a most important improvement— and also forms complete Kettle stitches, will sew books of any size up to 18 in. The needles are straight, and the necessary adjustments for various sizes of books are very simple.

Rounding and backing.

The machine for rounding and backing sewn books requires a rather elaborate and very careful setting of several parts to the exact requirement of each size to be worked. The sewn book with the back glued is caught in a clip and forced between two tight rollers, the result being that the hitherto flat back is automatically turned into a rounded shape (figs. 10 and 11). The book is then drawn forward, by a continuance of the onward movement, until it reaches the rounding plate, which is a block of steel with a polished groove a little larger than the size required. This rounding plate moves within a small arc by means of heavy counter-weights, and on the back of the book being strongly pressed against it, it receives the permanent form of the groove cut in it, at the same time a strong grip on each side of the book causes the ledge to rise up along each outer edge of the back. This ledge it is which enables the boards to be subsequently fixed in such a way as to hinge on a line outside the actual and natural boundary of the book. Before the discovery of the possibility of producing this ledge, the boards of books hinged upon a line coincident with the inner edges of the back, the result of which was that when the book was opened there was an invariable tendency to open and pull away the few outer sections of the paper or vellum itself—a destructive and disagreeable peculiarity. These machines are capable, after they are properly set, of rounding and backing about 750 volumes of the same size within an hour.

FIG. 10.—Section of back of book sewn on bands.

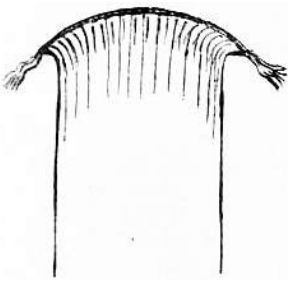

FIG. 11.—Section of same book after it has passed through the machine for rounding and backing.

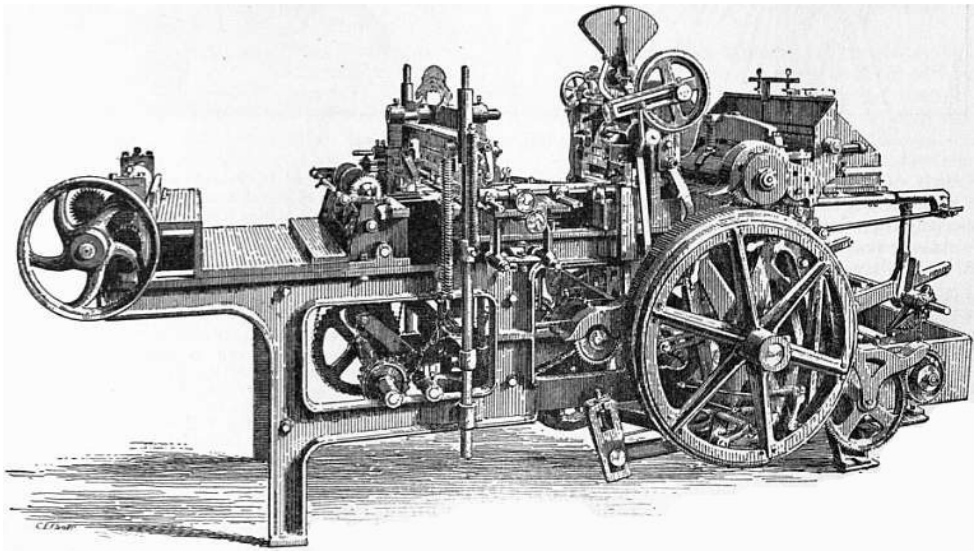

FIG. 12.—Case-making Machine.

The machine for making cases, or “case” covers (fig. 12), for books is large and complicated, but beautifully effective. It contains altogether over fifty springs, some of which are very small, like watch fittings, while others are large and powerful. The machine is fed with pieces of cardboard cut exactly to the sizes of the required boards, other pieces cut to the size of the back, and a long roll of the cloth with which the cases are to be covered, and when set working the roll of cloth is gradually unwound and glued by contact with a roller, which is drawn along until it reaches a point where the two boards are ingeniously dropped upon it one by one, then on again to where a long arm swings backwards and forwards, at each movement picking up a piece of cardboard for the back and placing it gently exactly upon the glued bed left for it between the two boards already fixed. Next, as the cloth passes along, it comes under the sharp influence of two rectangular gouges which cut out the corners, the remaining side pieces being gradually but irresistibly turned up by hollow raisers and flattened down by small rollers, a very delicate piece of machinery finishing the corners in a masterly way. Then, lastly, an arrangement of raisers and rollers acting at right angles to the last mentioned turn over and press out the remaining pieces of cloth. Of course each piece of cloth is cut across at the proper point before the turning up begins. This machine is capable of producing 1200 cases in an hour of any size that the machine will take.

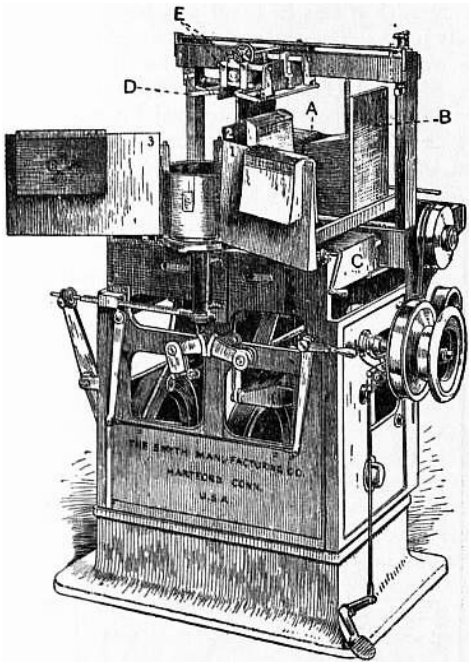

FIG. 13.—Smyth Casing-in Machine.

A. Cases. 1. 1st position.

B. Side of Case Hopper.
C. Paste box.
D. Head Clamp Rod.
E. Head Clamp.

2. 2nd position.
3. 3rd position and finished book. When in 2nd position the book drops to level of paste box.

The Smyth casing-in machine (fig. 13) pastes the sides of a book as required and then attaches the cover over all. Cleverly arranged rollers catch the book, and by a carefully regulated pressure fix the cover in the proper position. There is a "jointing-in" device which at a critical moment forces the joints in the cover into the joints in the book. It will work books from 4 to 22 in. in length and from ¼ to 3 in. in thickness, and can cover from 10 to 15 books per minute.

Here may also be mentioned the Sheridan wrappering machine, which covers magazines and pamphlets ranging from 5 to 12 in. in length at the rate of 40 a minute.

Wiring.

Wiring is a cheap method of keeping together thin parts of periodicals or tracts. The machine that executes it is simple in construction and use. It drives a short wire pin, bent at right angles at each end, through the folds of the sections of a book or through the entire thickness, sideways, after the manner of stabbing. The projecting ends, when through the substance of the paper, are bent over and flattened so as to grip firmly. The metal used for these pins was at first very liable to rust, and consequently did much damage to the paper near it, but this defect has now been largely remedied. At the same time the principle of using hard metal wire instead of flexible hempen thread is essentially vicious, and should only be used as a temporary expedient for publications of little value.

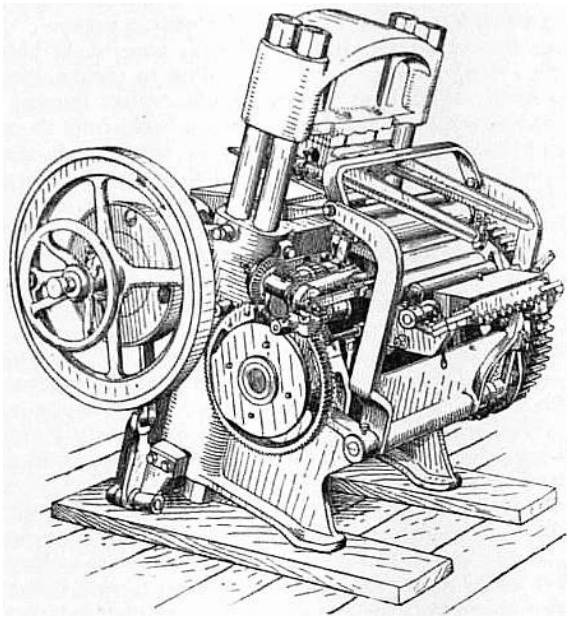

Fig. 14.—Blocking Machine.

Blocking.

The machines (fig. 14) now used for blocking designs upon book-covers are practically the same as have been employed for many years. Several small improvements have been introduced as to better inking of the rollers for colour work, and better heating of the blocks used for gold work. A blocking press is now, in consequence of the size of many of the blocks, a large and cumbersome machine. The block itself is fixed firmly in a strong metal bed, and a movable table in front of it is fitted with gauges which keep the cover exactly in its right place. For gold work the block is kept at the proper temperature by means of gas jets, and the cover being properly overlaid with gold leaf is passed, on its table, directly under the block and then pressed steadily upwards against it, lowered, drawn out, and the superfluous gold rubbed off. The same process is followed in the case of colour blocks, only now the block need not be heated, but is inked by means of a roller for each impression. A separate printing is necessary for each colour. These printings always require great care on the part of the operator, who has to watch the working of each pull very carefully, and if any readjustment is wanted, to make it at once, so that it is difficult to estimate at what rate they can be made. In the matter of gold blocking there must be great care exercised in the matter of the heat of the block, for if it is too hot the gold will adhere where it is not wanted, and if too cool it will not adhere where it is required. Great nicety is also necessary as to the exact pressure required as well as the precise number of moments during which the block should be in contact with the gold, which is fastened to the cloth or leather by means of the solidification by heat of egg albumen. Blocking presses are mainly of German make, but Scottish and English presses are also largely used.

Authorities.—See the *Anglo-Saxon Review* (1899-1901); C.J. Davenport, *Royal English Bookbindings* (1896), *Cantor Lectures on Bookbinding* (1898), *English Embroidered Bookbindings* (1899), *Life of Thomas Berthelet* (1901), *Life of Samuel Mearne* (1906); W.Y. Fletcher, *English Bookbindings in the British Museum* (1895), *Foreign Bookbindings in the British Museum* (1896); L. Gruel, *Manuel de l'amateur de relieures* (1887); H.P. Horne, *The Binding of Books* (1894); S.T. Prideaux, *Historical Sketch of Bookbinding* (1893); E. Thoinan, *Les Relieurs français* (1893); O. Uzanne, *La Relieure moderne* (1887); H.B. Wheatley, *Remarkable Bindings in the British Museum* (1889); J.W. Zaehnsdorf, *The Art of Bookbinding* (1880).

(C. D.)

BOOKCASE, an article of furniture, forming a shelved receptacle, usually perpendicular or horizontal, for the storage of books. When books, being written by hand, were excessively scarce, they were kept in small coffers which the great carried about with them on their journeys. As manuscript volumes accumulated in the religious houses or in regal palaces, they were stored upon shelves or in cupboards, and it is from these cupboards that the bookcase of to-day directly descends. At a somewhat later date the doors were, for convenience' sake, discarded, and the evolution of the bookcase made one step forward. Even then, however, the volumes were not arranged in the modern fashion. They were either placed in piles upon their sides, or if upright, were ranged with their backs to the wall and their edges outwards. The band of leather, vellum or parchment which closed the book was often used for the inscription of the title, which was thus on the fore-edge instead of on the back. It was not until the invention of printing had greatly cheapened books that it became the practice to write the title on the back and place the edges inwards. Early bookcases were usually of oak, which is still deemed to be the most appropriate wood for a stately library. The oldest bookcases in England are those in the Bodleian library at Oxford, which were placed in position in the last year or two of the 16th century; in that library are the earliest extant examples of shelved galleries over the flat wall-cases. Long ranges of book-shelves are necessarily somewhat severe in appearance, and many attempts have been made by means of carved cornices and pilasters to give them a more *riant* appearance—attempts which were never so successful as in the hands of the great English cabinet-makers of the second half of the 18th century.

Both Chippendale and Sheraton made or designed great numbers of bookcases, mostly glazed with little lozenges encased in fret-work frames often of great charm and elegance. The alluring grace of some of Sheraton's satinwood bookcases has very rarely indeed been equalled. The French cabinet-makers of the same period were also highly successful with small ornamental cases. Mahogany, rosewood, satinwood and even choicer exotic timbers were used; they were often inlaid with marqueterie and mounted with chased and gilded bronze. Dwarf bookcases were frequently finished with a slab of choice marble at the top. In the great public libraries of the 20th century the bookcases are often of iron, as in the British Museum where the shelves are covered with cowhide, of steel, as in the library of Congress at Washington, or of slate, as in the Fitzwilliam library at Cambridge. There are three systems of arranging bookcases—flat against the wall; in "stacks" or ranges parallel to each other with merely enough space between to allow of the passage of a librarian; or in bays or alcoves where cases jut out into the room at right angles to the wall-cases. The stack system is suitable only for public libraries where economy of space is essential; the bay system is not only handsome but utilizes the space to great advantage. The library of the city of London at the Guildhall is a peculiarly effective example of the bay arrangement.

> The whole question of the construction and arrangement of bookcases was learnedly discussed in the light of experience by W.E. Gladstone in the Nineteenth Century for March 1890.

(J. P.-B.)

BOOK-COLLECTING, the bringing together of books which in their contents, their form or the history of the individual copy possess some element of permanent interest, and either actually or prospectively are rare, in the sense of being difficult to procure. This qualification of rarity, which figures much too largely in the popular view of book-collecting, is entirely subordinate to that of interest, for the rarity of a book devoid of interest is a matter of no concern. On the other hand so long as a book (or anything else) is and appears likely to continue to be easily procurable at any moment, no one has any reason for collecting it. The anticipation that it will always be easily procurable is often unfounded; but so long as the anticipation exists it restrains collecting, with the result that Horn-books are much rarer than First Folio Shakespeares. It has even been laid down that the ultimate rarity of books varies in the inverse ratio of the number of copies originally printed, and though the generalization is a little sweeping, it is not far from the truth. To triumph over small difficulties being the chief element in games of skill, the different varieties of book-collecting, which offer almost as many varieties of grades of difficulty, make excellent hobbies. But in its essence the pastime of a book-collector is identical with the official work of the curator of a museum, and thus also with one branch of the duties of the librarian of any library of respectable age. In its inception every library is a literary workshop, with more or less of a garden or recreation ground attached according as its managers are influenced by the humanities or by a narrow conception of utility. As the library grows, the books and editions which have been the tools of one generation pass out of use; and it becomes largely a depository or storehouse of a stock much of which is dead. But from out of this seemingly dead stock preserved at haphazard, critics and antiquaries gradually pick out books which they find to be still alive. Of some of these the interest cannot be reproduced in its entirety by any mere reprint, and it is this salvage which forms the literary museum. Book-collectors are privileged to leap at once to this stage in their relations with books, using the dealers' shops and catalogues as depositories from which to pick the books which will best fit with the aim or central idea of their collection. For in the modern private collection, as in the modern museum, the need for a central idea must be fully recognized. Neither the collector nor the curator can be content to keep a mere curiosity-shop. It is the collector's business to illustrate his central idea by his choice of examples, by the care with which he describes them and the skill with which they are arranged. In all these matters many amateurs rival, if they do not outstrip, the professional curators and librarians, and not seldom their collections are made with a view to their ultimate transference to public ownership. In any case it is by the zeal of collectors that books which otherwise would have perished from neglect are discovered, cared for and preserved, and those who achieve these results certainly deserve well of the community.

Whenever a high degree of civilization has been attained book-lovers have multiplied, and to the student with his modest desire to read his favourite author in a well-written or well-printed copy there has been added a

class of owners suspected of caring more for the externals of books than for the enjoyment to be obtained by reading them. But although adumbrations of it existed under the Roman empire and towards the end of the middle ages, book-collecting, as it is now understood, is essentially of modern growth. A glance through what must be regarded as the medieval text-book on the love of books, the *Philobiblon*, attributed to Richard de Bury (written in 1345), shows that it deals almost exclusively with the delights of literature, and Sebastian Brant's attack on the book-fool, written a century and a half later, demonstrates nothing more than that the possession of books is a poor substitute for learning. This is so obviously true that before book-collecting in the modern sense can begin it is essential that there should be no lack of books to read, just as until cups and saucers became plentiful there was no room for the collector of old china. Even when the invention of printing had reduced the cost of books by some 80%, book-collectors did not immediately appear. There is a natural temptation to imagine that the early book-owners, whose libraries have enriched modern collectors with some of their best-known treasures, must necessarily have been collectors themselves. This is far from being the case. Hardly a book of all that Jean Grolier (1479-1565) caused to be bound so tastefully for himself and his friends reveals any antiquarian instincts in its liberal owner, who bought partly to encourage the best printers of his day, partly to provide his friends with the most recent fruits of Renaissance scholarship. In England Archbishop Cranmer, Lords Arundel and Lumley, and Henry, prince of Wales (1594-1612), in France the famous historian Jacques Auguste de Thou (1553-1617), brought together the best books of their day in all departments of learned literature, put them into handsome leather jackets, and enriched them with their coats of arms, heraldic badges or other marks of possession. But they brought their books together for use and study, to be read by themselves and by the scholars who frequented their houses, and no evidence has been produced that they appreciated what a collector might now call the points of a book other than its fine condition and literary or informational merits. Again, not a few other more or less famous men have been dubbed collectors on the score of a scanty shelf-full of volumes known to have been stamped with their arms. Collecting, as distinct both from the formation of working libraries and from casual ownership of this latter kind, may perhaps be said to have begun in England at the time of the antiquarian reaction produced by the book-massacres when the monasteries were dissolved by Henry VIII., and the university and college libraries and the parish service books were plundered and stript by the commissioners of Edward VI. To rescue good books from perishing is one of the main objects of book-collecting, and when Archbishop Parker and Sir Robert Cotton set to work to gather what they could of the scattered records of English statecraft and literature, and of the decorative art bestowed so lavishly on the books of public and private devotion, they were book-collectors in a sense and on a scale to which few of their modern imitators can pretend. Men of more slender purses, and armed with none of Archbishop Parker's special powers, worked according to their ability on similar lines. Humphrey Dyson, an Elizabethan notary, who collected contemporary proclamations and books from the early English presses, and George Thomason (d. 1666), the bookseller who bought, stored and catalogued all the pamphlet literature of the Civil War, were mindful of the future historians of the days in which they lived. By the end of the 17th century book-collecting was in full swing all over Europe, and much of its apparatus had come into existence. In 1676 book auctions were introduced into England from Holland, and soon we can trace in priced catalogues the beginning of a taste for Caxtons, and the books prized by collectors slowly fought their way up from amid the heavy volumes of theology by which they were at first overwhelmed.

While book-collecting thus came into existence it was rather as an added grace in the formation of a fine library than as a separate pursuit. Almost all the large book-buyers of the 16th, 17th and 18th centuries bought with a public object, or were rewarded for their zeal by their treasures being thought worthy of a public resting-place. Sir Thomas Smith (d. 1577) bequeathed his books to Queens' College, Cambridge; Archbishop Parker's were left under severe restrictions to Corpus Christi College in the same university; Sir Thomas Bodley refounded during his lifetime the university library at Oxford, to which also Laud gave liberally and Selden bequeathed his books. The library of Archbishop Williams went to St John's College, Cambridge; that of Archbishop Usher was bought for Trinity College, Dublin. The mathematical and scientific books of Thomas Howard, earl of Norfolk (d. 1646), were given by his grandson to the Royal Society; the heraldic collections of Ralph Sheldon (d. 1684) to Heralds' College; the library in which Pepys took so much pleasure to Magdalene College, Cambridge. Bishop Moore's books, including a little volume of Caxton quartos, almost all unique, were bought by George I. and presented to the university library at Cambridge. Archbishop Marsh, who had previously bought Stillingfleet's printed books (his manuscripts went to Oxford), founded a library at Dublin. The immense accumulations of Thomas Rawlinson (d. 1725) provided materials for a series of auctions, and Harley's printed books were sold to Osbourne the bookseller. But the trend was all towards public ownership. While Richard Rawlinson (d. 1755) allowed his brother's books to be sold, the best of his own were bequeathed to Oxford, and the Harleian MSS. were offered to the nation at a sum far below their value. A similar offer of the great collections formed by Sir Hans Sloane, including some 50,000 printed books, together with the need for taking better care of what remained of the Cotton manuscripts, vested in trustees for public use in 1702 and partially destroyed by fire in 1731, led to the foundation of the British Museum in 1753, and this on its opening in 1757 was almost immediately enriched by George II.'s gift of the old royal library, formed by the kings and queens of England from Henry VII. to Charles II., and by Henry, prince of Wales, son of James I., who had bought the books belonging to Archbishop Cranmer and Lords Arundel and Lumley. A few notable book-buyers could not afford to bequeath their treasures to libraries, *e.g.* Richard Smith, the secondary of the Poultry Compter (d. 1675), at whose book-sale (1682) a dozen Caxtons sold for from 2 S. to 18 S. apiece, Dr Francis Bernard (d. 1698), Narcissus Luttrell(d. 1732) and Dr Richard Mead (d. 1754). At the opposite end of the scale, in the earls of Sunderland (d. 1722) and Pembroke (d. 1733), we have early examples of the attempts, seldom successful, of book-loving peers to make their libraries into permanent heirlooms. But as has been said, the drift up to 1760 was all towards public ownership, and the libraries were for the most part general in character, though the interest in typographical antiquities was already well marked.

When George III. came to the throne he found himself bookless, and the magnificent library of over 80,000 books and pamphlets and 440 manuscripts which he accumulated shows on a large scale the catholic and literary spirit of the book-lovers of his day. As befitted the library of an English king it was rich in English classics as well as in those of Greece and Rome, and the typographical first-fruits of Mainz, Rome and Venice were balanced by numerous works from the first presses of Westminster, London and Oxford. This noble library passed in 1823 to the British Museum, which had already received the much smaller but carefully chosen collection of the Rev. C.M. Cracherode (d. 1799), and in 1846 was further enriched by the wonderful library formed by Thomas Grenville, the last of its great book-loving benefactors, who died in that year, aged ninety-

one. A few less wealthy men had kept up the old public-spirited tradition during George III.'s reign, Garrick bequeathing his fine collection of English plays and Sir Joseph Banks his natural history books to the British Museum, while Capell's Shakespearian treasures enriched Trinity College, Cambridge, and those of Malone went to the Bodleian library at Oxford, the formation of these special collections, in place of the large general library with a sprinkling of rarities, being in itself worth noting. But the noble book-buyers celebrated by the Rev. Thomas Frognall Dibdin in his numerous bibliographical works kept mainly on the old lines, though with aims less patriotic than their predecessors. The duke of Roxburghe's books were sold in 1812, and the excitement produced by the auction, more especially by the competition between Lord Spencer and the duke of Marlborough (at that time marquess of Blandford) for an edition of Boccaccio printed by Valdarfer at Venice in 1471, led to the formation of the Roxburghe Club at a commemorative dinner. In 1819 the duke of Marlborough's books were sold, and the Boccaccio for which he had paid £2260 went to Earl Spencer (d. 1834) for £750, to pass with the rest of his rare books to Mrs Rylands in 1892, and by her gift to the John Rylands library at Manchester in 1899. The books of Sir M.M. Sykes were sold in 1824, those of J.B. Inglis in 1826 (after which he collected again) and those of George Hibbert in 1829. The 150,000 volumes brought together by Richard Heber at an expense of about £100,000 were disposed of by successive sales during the years 1834-1837 and realized not much more than half their cost. The wonderful library of William Beckford (d. 1844), especially rich in fine bindings, bequeathed to his daughter, the duchess of Hamilton, was sold in 1882, with the Hamilton manuscripts, for the most part to the German government. Their dispersal was preceded in 1881 by that of the Sunderland collection, already mentioned. The library of Brian Fairfax (d. 1749), which had passed to the earls of Jersey, was sold in 1885, that of Sir John Thorold (d. 1815) in 1884, his "Gutenberg" Bible fetching £3900 and his Mainz Psalter £4950. The great collection of manuscripts formed by Sir Thomas Phillipps (d. 1872) has furnished materials for numerous sales. The printed books of the earl of Ashburnham (d. 1878) kept the auctioneers busy in 1897 and 1898; his manuscripts were sold, some to the British government (the Stowe collection shared between the British Museum and Dublin), the German government (part of the Libri and Barrois collection, all, save one MS. of 13th century German ballads, resold to France), the Italian government (the rest of the Libri collection) Mr Yates Thompson (the MSS. known as the Appendix) and Mr J. Pierpont Morgan (the Lindau Gospels). The collections formed by Mr W.H. Miller (d. 1848, mainly English poetry), the duke of Devonshire (d. 1858) and Mr Henry Huth (d. 1878), are still intact.

Among the book-buyers of the reign of George III., John Ratcliffe, an ex-coal-merchant, and James West had devoted themselves specially to Caxtons (of which the former possessed 48 and the latter 34) and the products of other early English presses. The collections of Capell and Garrick were also small and homogeneous. Each section, moreover, of some of the great libraries that have just been enumerated might fairly be considered a collection in itself, the union of several collections in the same library being made possible by the wealth of their purchaser and the small prices fetched by most classes of books in comparison with those which are now paid. But perhaps the modern cabinet theory of book-collecting was first carried out with conspicuous skill by Henry Perkins (d. 1855), whose 865 fine manuscripts and specimens of early printing, when sold in 1870, realized nearly £26,000. If surrounded by a sufficient quantity of general literature the collection might not have seemed noticeably different from some of those already mentioned, but the growing cost of books, together with difficulties as to house-room, combined to discourage miscellaneous buying on a large scale, and what has been called the "cabinet" theory of collecting, so well carried out by Henry Perkins, became increasingly popular among book buyers, alike in France, England and the United States of America. Henri Béraldi, in his catalogue of his own collection (printed 1892), has described how in France a little band of book-loving amateurs grew up who laughed at the *bibliophile de la vieille roche* as they disrespectfully called their predecessors, and prided themselves on the unity and compactness of their own treasures. In place of the miscellaneous library in which every class of book claimed to be represented, and which needed a special room or gallery to house it, they aimed at small collections which should epitomize the owner's tastes and require nothing bulkier than a neat bookcase or cabinet to hold them. The French bibliophiles whom M. Béraldi celebrated applied this theory with great success to collecting the dainty French illustrated books of the 18th century which were their especial favourites. In England Richard Fisher treated his fine examples of early book-illustration as part of his collection of engravings, etchings and woodcuts (illustrated catalogue printed 1879), and Frederick Locker (Locker-Lampson) formed in two small bookcases such a gathering of first editions of English imaginative literature that the mere catalogue of it (printed in 1886) produced the effect of a stately and picturesque procession. Some of the book-hoards of previous generations could have spared the equivalent of the Locker collection without seeming noticeably the poorer, but the compactness and unity of this small collection, in which every book appears to have been bought for a special reason and to form an integral part of the whole, gave it an artistic individuality which was a pleasant triumph for its owner, and excited so much interest among American admirers of Mr Locker's poetry that it may be said to have set a fashion. As another example of the value of a small collection, both for delight and for historical and artistic study, mention may be made of the little roomful of manuscripts and incunabula which William Morris brought together to illustrate the history of the bookish arts in the middle ages before the Renaissance introduced new ideals. Many living collectors are working in a similar spirit, and as this spirit spreads the monotony of the old libraries, in which the same editions of the same books recurred with wearisome frequency, should be replaced by much greater individuality and variety. Moreover, if they can be grouped round some central idea cheap books may yield just as good sport to the collector as expensive ones, and the collector of quite modern works may render admirable service to posterity. The only limitation is against books specially manufactured to attract him, or artificially made rare. A quite wholesome interest in contemporary first editions was brought to nought about 1889 by the booksellers beginning to hoard copies of Browning's *Asolando* and Mr Lang's *Blue Fairy Book* on the day of publication, while a graceful but quite minor poet was made ridiculous by £100 being asked for a set of his privately printed *opuscula*. The petty gambling in books printed at the Kelmscott and Doves' presses, and in the fine paper copies of a certain *Life of Queen Victoria*, for which a premium of 250% was asked before publication, is another proof that until the manufacturing stage is over collecting cannot safely begin. But with this exception the field is open, and the 19th century offers as good a hunting ground as any of its predecessors.

While book-collecting may thus take an endless variety of forms the heads under which these may be grouped are few and fairly easily defined. They may be here briefly indicated together with some notes as to the literature which has grown up round them. The development which bibliographical literature has taken is indeed very significant of the changed ideals of collectors. Brunet's *Manuel du libraire*, first published in 1810, attained its fifth edition in 1860-1864, and has never since

Objects and methods.

been re-edited (supplement, 1878-1880). The *Bibliographer's Manual of English Literature* by W.T. Lowndes, first published in 1834, was revised by H.G. Bohn in 1857-1864, and of this also no further edition has been printed. These two works between them gave all the information the old-fashioned collectors required, the *Trésor de livres rares et précieux* by J.G.T. Graesse (Dresden, 1859-1867, supplementary volume in 1869) adding little to the information given by Brunet. The day of the omnivorous collector being past, the place of these general manuals has been taken by more detailed bibliographies and handbooks on special books, and though new editions of both Lowndes and Brunet would be useful to librarians and booksellers no publisher has had the courage to produce them.

To attract a collector a book must appeal to his eye, his mind or his imagination, and many famous books appeal to all three. A book may be beautiful by virtue of its binding, its illustrations or the simple perfection and harmony of its print and paper. The attraction of a fine binding has always been felt in France, the high prices quoted for Elzevirs and French first editions being often due much more to their 17th and 18th century jackets than to the books themselves. The appreciation of old bindings has greatly increased in England since the exhibition of them at the Burlington Fine Arts Club in 1891 (illustrated catalogue printed the same year), English blind stamped bindings, embroidered bindings, and bindings attributable to Samuel Mearne (*temp.* Charles II.) being much more sought after than formerly. (See Bookbinding.)

Illustrated books of certain periods are also much in request, and with the exception of a few which early celebrity has prevented becoming rare have increased inordinately in price. The primitive woodcuts in incunabula are now almost too highly appreciated, and while the *Nuremburg Chronicle* (1493) seldom fetches more than £30 or the *Hypnerotomachia Poliphili* (Venice, 1499) more than £120, rarer books are priced in hundreds. The best books on the subject are: for Italy, Lippmann's *Wood Engraving in Italy in the 15th Century* (1888), Kristeller's *Early Florentine Woodcuts* (1897), the duc de Rivoli's (Prince d'Essling's) *Bibliographie des livres à figures vénitiens 1469-1525* (1892, new edition 1906); for Germany, Muther's *Die deutsche Bücherillustration der Gothik und Frührenaissance* (1884); for Holland and Belgium, Sir W.M. Conway's *The Woodcutters of the Netherlands in the 15th Century* (1884); for France the material will all be found in Claudin's *Histoire de l'imprimerie en France* (1900, &c.). Some information on the illustrated books of the early 16th century is given in Butsch's *Die Bücherornamentik der Renaissance* (1878), but the pretty French books of the middle of the century and the later Dutch and English copper-engraved book illustrations (for the latter see Colvin's *Early Engraving and Engravers in England*, 1905) have been imperfectly appreciated. This cannot be said of the French books of the 18th century chronicled by H. Cohen, *Guide de l'amateur de livre à gravures du XVIII^e^ siècle* (5th ed., 1886), much of the same information, with a little more about English books, being given in Lewine's *Bibliography of Eighteenth Century Art and Illustrated Books* (1898). English books with coloured illustrations, for which there has arisen a sudden fashion, are well described in Martin Hardie's *English Colour Books* (1906). Bewick's work has been described by Mr Austin Dobson.

Appreciation of finely printed books has seldom extended much beyond the 15th century. In addition to the works mentioned in the article on incunabula(*q.v.*), note may be made of Humphrey's *Masterpieces of the Early Printers and Engravers* (1870), while Lippmann's *Druckschriften des XV. bis XVIII Jahrhunderts* (1884-1887) covers, though not very fully, the later period.

Among books which make an intellectual appeal to the collectors may be classed all works of historical value which have not been reprinted, or of which the original editions are more authentic, or convincing, than modern reprints. It is evident that these cover a vast field, and that the collector in taking possession of any corner of it is at once the servant and rival of historical students. Lord Crawford's vast collections of English, Scottish and Irish proclamations and of papal bulls may be cited as capital instances of the work which a collector may do for the promotion of historical research, and the philological library brought together by Prince Lucien Bonaparte (*An Attempt at a Catalogue* by V. Collins, published 1894) and the Foxwell collection of early books on political economy (presented to the university of London by the Goldsmiths' Company) are two other instances of recent date. Much collecting of this kind is now being carried on by the libraries of institutes and societies connected with special professions and studies, but there is ample room also for private collectors to work on these lines.

Of books which appeal to a collector's imagination the most obvious examples are those which can be associated with some famous person or event. A book which has belonged to a king or queen (more especially one who, like Mary queen of Scots, has appealed to popular sympathies), or to a great statesman, soldier or poet, which bears any mark of having been valued by him, or of being connected with any striking incident in his life, has an interest which defies analysis. Collectors themselves have a natural tenderness for their predecessors, and a copy of a famous work is all the more regarded if its pedigree can be traced through a long series of book-loving owners. Hence the production of such works as *Great Book-Collectors* by Charles and Mary Elton (1893), *English Book-Collectors* by W.Y. Fletcher (1902) and Guigard's *Nouvel armorial du bibliophile* (1890). Books condemned to be burnt, or which have caused the persecution of their authors, have an imaginative interest of another kind, though one which seems to have appealed more to writers of books than to collectors. As has already been noted, most of the books specially valued by collectors make a double or triple appeal to the collecting instinct, and the desire to possess first editions may be accounted for partly by their positive superiority over reprints for purposes of study, partly by the associations which they can be proved to possess or which imagination creates for them. The value set on them is at least to some extent fanciful. It would be difficult, for instance, to justify the high prices paid by collectors of the days of George III. for the first printed editions of the Greek and Latin classics. With few exceptions these are of no value as texts, and there are no possible associations by which they can be linked with the personality of their authors. It may be doubted whether any one now collects them save as specimens of printing, though no class of books which has once been prized ever sinks back into absolute obscurity. On the other hand the prestige of the first editions of English and French literary masterpieces has immensely increased. A first folio Shakespeare (1623) was in 1906 sold separately for £3000, and the MacGeorge copies of the first four folios (1623, 1632, 1663-1664 and 1685) fetched collectively the high price of £10,000. The quarto editions of Shakespeare plays have appreciated even more, several of these little books, once sold at 6d. apiece, having fetched over £1000, while the unknown and unique copy of the 1594 edition of *Titus Andronicus*, discovered in Sweden, speedily passed to an American collector for £2000. Information as to early editions of famous English books will be found in Lowndes' *Bibliographer's Manual*, in Hazlitt's *Handbook to the Popular Poetical and Dramatic Literature of Great Britain from the Invention of Printing to the Restoration* (1867) and his subsequent *Collections and Notes*

(1876-1903), and as to more recent books in Slater's *Early Editions, a bibliographical survey of the works of some popular modern authors* (1894), while French classics have found an excellent chronicler in Jules Le Petit (*Bibliographie des principales éditions originales d'écrivains français du XV^e^ au XVIII^e^ siècle*, 1888).

In most cases there is a marked falling off in the interest with which early editions other than the first are regarded, and consequently in the prices paid for them, though important changes in the text give to the edition in which they first occur some shadow of the prestige attaching to an original issue. One of the recognized byways of book-collecting, however, used to be the collection of as many editions as possible of the same work. When this result in the acquisition of numerous late editions of no value for the text its only usefulness would appear to be the index it may offer to the author's popularity. But in translations of the Bible, in liturgical works, and in editions published during the author's life the aid offered to the study of the development of the final text by a long row of intermediate editions may be very great.

Another instance in which imagination reinforces the more positive interest a book may possess is in the case of editions which can be connected with the origin, diffusion or development of printing. Piety suggests that book-lovers should take a special interest in the history of the art which has done so much for their happiness, and in this respect they have mostly shown themselves religious. The first book printed in any town is reasonably coveted by local antiquaries, and the desire to measure the amount and quality of the work of every early printer has caused the preservation of thousands of books which would otherwise have perished. (See INCUNABULA.)

The financial side of book-collecting may be studied in Slater's *Book-Prices Current*, published annually since 1887, and in Livingston's *American Book Prices Current*, and in the same author's *Auction Prices of Books* (1905). While largely influenced by fashion the prices given for books are never wholly unreasonable. They are determined, firstly by the positive or associative interest which can be found in the book itself, secondly by the infrequency with which copies come into the market compared with the number and wealth of their would-be possessors, and thirdly, except in the case of books of the greatest interest and rarity, by the condition of the copy offered in respect to completeness, size, freshness and absence of stains.

(A. W. PO.)

BOOK-KEEPING, a systematic record of business transactions, in a form conveniently available for reference, made by individuals or corporations engaged in commercial or financial operations with a view to enabling them with the minimum amount of trouble and of dislocation to the business itself to ascertain at any time (1) the detailed particulars of the transactions undertaken, and (2) the cumulative effect upon the business and its financial relations to others. Book-keeping, sometimes described as a science and sometimes as an art, partakes of the nature of both. It is not so much a discovery as a growth, the crude methods of former days having been gradually improved to meet the changing requirements of business, and this process of evolution is still going on. The ideal of any system of book-keeping is the maximum of record combined with the minimum of labour, but as dishonesty has to be guarded against, no system of book-keeping can be regarded as adequate which does not enable the record to be readily verified as a true and complete statement of the transactions involved. Such a verification is called an audit, and in the case of public and other large concerns is ordinarily undertaken by professional accountants (*q.v.*). Where the book-keeping staff is large it is usually organized so that its members, to some extent at least, check each other's work, and to that extent an audit, known as a "staff audit" or "internal check," is frequently performed by the book-keeping staff itself.

Formerly, when credit was a considerably less important factor than now in commercial transactions, book-keeping was frequently limited to an account of receipts and payments of money; and in early times, before money was in use, to an account of the receipt and issue of goods of different kinds. Even now what may be called the "cash system" of accounts is almost exclusively used by governments, local authorities, and charitable and other institutions; but in business it is equally necessary to record movements of credit, as a mere statement of receipts and payments of money would show only a part of the total number of transactions undertaken. As for practical purposes some limit must be placed upon the daily record of transactions, certain classes show only a record of cash receipts and payments, which must, when it is desired to ascertain the actual position of affairs, be adjusted by bringing into account those transactions which have not yet been completed by the receipt or payment of money. For instance, it is usual to charge customers with goods sold to them at the date when the sale takes place, and to give them credit for the amount received in payment upon the date of receipt (thus completely recording every phase of the transaction as and when it occurs); but in connexion (say) with wages it is not usual to give each workman credit for the services rendered by him from day to day, but merely to charge up the amounts, when paid, to a wages account, which thus at any date only shows the amounts which have actually been paid, and takes no cognisance of the sums accruing due. When, therefore, it is desired to ascertain the actual expenditure upon wages for any given period, it is necessary to allow for the payments made during that period in respect of work previously performed, and to add the value of work performed during the current period which remains unpaid. In the majority of businesses those accounts which deal with various forms of standing expenses are thus dealt with, and in consequence the record, as it appears from day to day, is *pro tanto* incomplete. Another very important series of transactions which is not included in the ordinary day-to-day record is that representing the loss gradually accruing by reason of waste, or depreciation, of assets or general equipment of the business; proper allowance for these losses must of course be made whenever it is desired to ascertain the true position of affairs.

History.

The origin of book-keeping is lost in obscurity, but recent researches would appear to show that some method of keeping accounts has existed from the remotest times. Babylonian records have been found dating back as far as 2600 B.C., written with a stylus on small slabs of clay, and it is of interest to note (*Records of the Past*, xi. 89) that these slabs or tablets "usually contain impressions from cylinder seals, and nail marks, which were considered to be a man's natural seal," thus showing that the modern method of identifying criminals by finger prints had its counterpart in Babylonia some

4500 years ago. Egyptian records were commonly written on papyrus, and contemporary pictures show a scribe keeping account of the quantities of grain brought into and removed from the government store-houses. It will thus be seen that some form of book-keeping existed long before bound books were known, and therefore the more general term *accounting* would seem to be preferable—the more so as the most modern developments are in the direction of again abandoning the bound book in favour of loose or easily detached sheets of paper or card, thus capable of being rearranged as circumstances or convenience may dictate. Most of the earlier accounting records are in the nature of a mere narrative of events, which—however complete in itself—failed to fulfil the second requirement of an adequate system of book-keeping already referred to. Prior to the use of money nothing in this direction could of course well be attempted; but for a long time after its employment became general money values were recorded in Roman figures, which naturally did not lend themselves to ready calculation.

At the present-time it may be generally stated that all book-keeping records are kept in three distinct columns, dealing respectively with the date of the transaction, its nature, and its money value. The earliest extant example of accounts so kept is probably a ledger in the Advocates' library at Edinburgh, dated 1697, which, it is of interest to note, is ruled by hand. Prior to that time, however, double-entry book-keeping had been in general use. The exact date of its introduction is unknown; but it was certainly not, as has been frequently stated, the invention of Lucas de Bergo, in or about 1494. This, however, is the date of the first issue (at Venice) of a printed book entitled *Everything about Arithmetic, Geometry and Proportion*, by Luca Paciolo, which contains *inter alia* an explanation of book-keeping by double-entry as then understood; but in all probability, the system had then been in use for something like 200 years. It is perhaps unfortunate that from 1494 until comparatively recent times the literature of accounting has been provided by theorists and students, rather than by practical business men, and it may well be doubted, therefore, whether it accurately describes contemporary procedure. Another illusion which it is necessary to expose in the interests of truth is the value attached to *Jones's English System of Book-keeping by Single or Double Entry*, published at Bristol in 1796. Before publishing this book, E.T. Jones issued a prospectus, stating that he had patented an entirely new and greatly improved system, and that subscribers (at a guinea a copy) would be entitled to a special licence empowering them to put the new invention into practice in their own book-keeping. With this bait he secured thousands of subscribers, but so far as can be gathered his system was entirely without merit, and it is chiefly of interest as indicating the value, even then, of advertising.

Modern methods.

It is impossible here to describe fully all the improvements that have been made in methods of accounting during recent years, but it is proposed to deal with the more important of these improvements, after the general principles upon which all systems of book-keeping are based have been briefly described.

The centre of all book-keeping systems is the *ledger*, and it may be said that all other books are only kept as a matter of practical convenience— hence the name "subsidiary books" that is frequently applied thereto. Inasmuch, however, as the transactions are first recorded in these subsidiary books, and afterwards classified therefrom into the ledger, the names *books of entry* or *books of first entry* are often employed. Subsidiary books which do not form the basis of subsequent entries into the ledger, but are merely used for statistical purposes, are known as *statistical* or *auxiliary books*. In the early days of book-keeping the ledger comprised merely those accounts which it was thought desirable to keep accessible, and was not a complete record of all transactions. Thus in many instances records were only kept of transactions with other business houses, known as *personal accounts*. In the earliest examples transactions tending to reduce indebtedness were recorded in order of date, as they occurred underneath transactions recording the creation of the indebtedness; and the amount of the reduction was subtracted from the sum of the indebtedness up to that date. This method was found to be inconvenient, and the next step was to keep one account of the transactions recording the creation of indebtedness and another account (called the *contra account*) of those transactions reducing or extinguishing it. For convenience these two accounts were kept on opposite sides of the ledger, and thus was evolved the *Dr*. and *Cr*. account as at present in general use:—

Dr. A.B.				Contra.	*Cr*.
Date.	Narrative.	Amount.	Date.	Narrative.	Amount.
		£ *s. d.*			£ *s. d.*

In this form of account all transactions creating indebtedness due from the person named therein to the business—that is to say, all benefits received by that person from the buisness—are recorded upon the left-hand, or *Dr*. side, and *per contra* all transactions representing benefits imparted by him, giving rise to a liability on the part of the business, are recorded upon the *Cr*. side. The account may run on indefinitely, but as a matter of convenience is usually ruled off each time all indebtedness is extinguished, and also at certain periodical intervals, so that the state of the account may then be readily apparent.

Single-entry accounts.

A mere collection of *personal accounts* is, however, obviously a very incomplete record of the transactions of any business, and does not suffice to enable a statement of its financial position to be prepared. So at an early date other accounts were added to the ledger, recording the acquisition of and disposal of different classes of property, such accounts being generally known as *real accounts*. These accounts are kept upon the same principle as personal accounts, in that all expenditure upon the part of the business is recorded upon the *Dr*. side, and all receipts upon the *Cr*. side; the excess of the debit entries over the credit entries thus showing the value placed upon those assets that still remain the property of the business. With the aid of personal and real accounts properly written up to date, it is possible at any time to prepare a statement of assets and liabilities showing the financial position of a business, and the following is an example of such a statement, which shows also how the profit made by the business may be thus ascertained, assuming that the financial position at the commencement of the current financial period, and the movements of capital into and out of the business during the period, are capable of being ascertained.

	Liabilities.				*Assets.*			
	Trade Creditors	£4,961	10	0	Fixtures, Furniture, &c.	£1,269	4	3
	Bills Payable	2,620	18	4	Stock on hand	5,751	3	10
	Balance, being excess of assets over liabilities (or "Capital") at this date carried down	14,918	7	4	Trade Debtors	3,842	7	9
					Bills Recievable	7,468	14	3
					Cash at Bank	4,169	5	5
		£22,500	15	6		£22,500	15	6
	Amount of Capital on 1st Jan. 1906	£15,010	1	7	Balance brought down	£14,918	7	2
	Balance, being net profit for the year ended this date	1,408	5	7	Amount drawn out of business during year ended this date	1,500	0	0
		£16,418	7	2		£16,418	7	2

The method of accounting hitherto described represents *single-entry*, which—albeit manifestly incomplete—is still very generally used by small business houses, and particularly by retail traders. Its essential weakness is that it provides no automatic check upon the clerical accuracy of the record, and, should any mistake be made in the keeping of the books, or in the extraction therefrom of the lists of assets and liabilities, the statement of assets and liabilities and the profit or loss of the current financial period, will be incorrect to an equal extent. It was to avoid this obvious weakness of single-entry that the system of double-entry was evolved.

Double-entry.

The essential principle of double-entry is that it constitutes a complete record of *every* business transaction, and as these transactions are invariably cross-dealings—involving simultaneously the receipt of a benefit by some one and the imparting of a benefit by some one—a complete record of transactions from both points of view necessitates an entry of equal amount upon debit and credit sides of the ledger. Hence it follows that, if the clerical work be correctly performed, the aggregate amount entered up upon the debit side of the ledger must at all times equal the aggregate amount entered up upon the credit side; and thus a complete list of all ledger balances will show an agreement of the total debit balances with the total credit balances. Such a list is called a *trial balance*, an example of which is given below. It should be observed, however, that the test supplied by the *trial balance* is a purely mechanical one, and does not prove the absolute accuracy of the ledger as a record of transactions. Thus transactions which have actually taken place may have been omitted from the books altogether, or they may have been recorded to the wrong accounts, or the money values attached to them may be incorrect; or, yet again, fictitious records may be entered in the ledger of transactions which have never taken place. A *trial balance* is thus no very adequate safeguard against fraud, nor does it bring to light mistakes in the monetary value attaching to the various transactions recorded. This last point is of especial importance, in that the monetary value of transactions may have been correctly recorded in the first instance, but owing to altered circumstances may have become inaccurate at a later date. This of course means that the altered circumstances constitute an additional "transaction" which has been omitted.

Trial Balance, 31st December 1906

		Dr.			*Cr.*		
1	Capital account				£15,010	1	7
5	Drawings	1,500	0	0			
20	Trade creditors				4,961	10	0
24	Fixtures, furniture, &c.	1,269	4	3			
27	Bills payable				2,620	18	4
40	Bad debts	71	4	2			
44	Stock 1st Jan. 1906	4,078	16	4			
50	Discounts allowed	975	3	3			
53	Trade debtors	3,842	7	9			
60	Discounts received				1,117	17	8
65	Wages and salaries	1,865	12	0			
75	Depreciation	141	0	5			
78	Rent, rates and taxes	1,242	13	8			
82	General expenses	1,087	8	0			
90	Bills receivable	7,468	14	3			
97	Purchases	44,731	2	10			
100	Sales				48,732	4	9
C56	Cash at bank	4,169	5	5			
		£72,442	12	4	£72,442	12	4

It will be observed, therefore, that in order to complete the record of the transactions by double-entry, it has become necessary to introduce into the ledger a third class of accounts, known as *impersonal* or *nominal accounts*. These accounts record the transferences of money, or of money's worth, which, so far from representing a mere reshuffling of assets and liabilities, involve an increase in or a reduction of the amount invested in the business, *i.e.* a profit or a loss. Transactions representing profits are recorded upon the *Cr.* side of nominal accounts, and those representing losses (including expenses) upon the *Dr.* side. This is consistent with the rules already laid down in connexion with real and nominal accounts, inasmuch as expenditure which does not result in the acquisition of an asset is a loss, whereas receipts which do not involve the creation of liabilities represent profits. All debit balances therefore that are not assets are losses, and *per contra* all credit balances that are not liabilities are profits. So that, inasmuch as double-entry provides *inter alia* a complete

statement under suitable headings of all profits and all losses, it is possible by aggregating these results to deduce therefrom the net profit or loss of carrying on the business—and that by a method entirely distinct from that previously described in connexion with single-entry, thus constituting a valuable additional check. Taking the trial balance shown above, the following represent the *trading account*, *profit and loss account*, and *balance sheet* compiled therefrom. The trading account may be variously regarded as the account recording the movements of goods which represent the stock-in-trade, and as a preliminary to (or a subdivision of) the profit and loss account. The balance sheet is a statement of the assets and liabilities; but—inasmuch as, by transferring the balance of the profit and loss account to the capital account, it is possible to bring the latter account up to date and to show the credit balance representing the surplus of assets over liabilities to date—the balance sheet, instead of showing a difference, or a "balance," representing what is *assumed to be* the amount of the capital to date, shows an absolute agreement of assets upon the one hand and of liabilities *plus* capital upon the other. The two sides of the account thus balance—hence the name.

Balance sheet.

Dr. TRADING ACCOUNT for the Year ended 31st December 1906 *Cr.*

	To Stock on hand, 1st Jan. 1906	£4,078	16	4		By Sales	£48,732	4	9
	” Purchases	44,731	2	10		” Stock on hand 31st Dec. 1906	5,751	3	10
	” Gross Profit, transferred to Profit and Loss account	5,673	9	5					
		£54,483	8	7			£54,483	8	7

Dr. PROFIT AND LOSS ACCOUNT for the Year ended 31st December 1906 *Cr.*

	To Rent, rates and taxes £1,242 13 8					By Gross Profit as per Trading Account	£5,673	9	5
	” Salaries and wages 1,865 12 0					” Discount received	1,117	17	8
	” General expenses 1,087 8 0								
		£4,195	13	8					
	” Discounts allowed	975	3	3					
	” Bad debts	71	4	2					
	” Deprecation	141	0	5					
	” Net Profit for the year transferred to Capital account	1,408	5	7					
		£6,791	7	1			£6,791	7	1

Dr. BALANCE SHEET as at 31st December 1906 *Cr.*

	To A.B., Capital account	£14,918	7	2		By Fixtures, furniture, &c.	£1,269	4	3
	” Trade creditors	4,961	10	0		” Stock on hand	5,751	3	10
	” Bills payable	2,620	18	4		” Trade debtors	3,842	7	9
						” Bills receivable	7,468	14	3
						” Cash at bank	4,169	5	5
		£22,500	15	6			£22,500	15	6

Dr. A.B., CAPITAL ACCOUNT *Cr.*

					1906.				
1906.	To Drawings account	£1,500	0	0	Jan. 1	By balance from last account	£15,010	1	7
Dec 31	” Balance carried down	14,918	7	2	Dec. 31	” Profit and Loss account, being net profit for the year ended this date	1,408	5	7
		£16,418	7	2			£16,418	7	2
					1907.				
					Jan. 1	By Balance brought down	£14,918	7	2

In the foregoing example the customary method has been followed of deducting withdrawals of capital from the capital account and of adding profits thereto. Sometimes, however, the balance of the capital account remains constant, and the drawings and net profits are transferred to a separate account called *current account*. This plan is but rarely observed in the case of undertakings owned by individuals, or private firms, but is invariably adopted in connexion with joint-stock companies, although in such cases the name *appropriation of profit account* is generally employed.

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Journal.

Although it is now usual to employ several books of first-entry, in the case of comparatively small businesses one such book is sufficient for all purposes, in that it is practicable for one person to record all the transactions that take place as and when they occur. A book of this description is called the *journal*, and for many years represented the only book of first-entry employed in book-keeping. An example of the journal is given below. The entries appearing therein are such as would be necessary to prepare the trading and profit and loss accounts from the trial balance shown above, and to bring the capital account up to date.

In modern times, however, with the growth of business, it was soon found impracticable to keep one book of first-entry for all transactions, and accordingly it became necessary either to treat the journal as an intermediate book, in which the transactions might be brought together and focused as a preliminary to being recorded in the ledger, or else to split up the journal into numerous books of first-entry, each of which might in that case be employed for the record of a particular class of transaction. The first method has been generally adopted in the continental countries of Europe, as will be shown later on, whereas in Great Britain and in North America the latter method more generally obtains; that is, instead of having one journal in which all classes of transactions are recorded in the first instance, it is usual to employ several journals, as follows:—a *sales journal, sales book* or *day book*, to record particulars of goods sold; a *bought journal, invoice book* or *purchases book*, to record particulars of goods purchased; a *returns inwards book*, to record particulars of goods sold but subsequently returned by customers; a *returns outwards book*, to record the like particulars with regard to goods purchased and subsequently returned; a *bills receivable book*, to record particulars of bills of exchange received from debtors; and a *bills payable book*, to record particulars of bills of exchange given to creditors.

			Dr.			*Cr.*		
Dec. 31	Trading account	110	£48,809	19	2			
	To Stock account	44				£4,078	16	4
	” Purchases account	97				44,731	2	10
”	Sales account	100	48,732	4	9			
	Stock account	44	5,751	3	10			
	To Trading account	110				54,483	8	7
”	Trading account	110	5,673	9	5			
	To Profit and Loss account	120				5,673	9	5
”	Profit and Loss account	120	5,383	1	6			
	To Rent, rates and taxes	78				1,242	13	8
	” Salaries and wages	65				1,865	12	0
	” General expenses	82				1,087	8	0
	” Discounts allowed	50				975	3	3
	” Bad debts	40				71	4	2
	” Depreciation	75				141	0	5
”	Discounts received	60	1,117	17	8			
	To Profit and Lossaccount	120				1,117	17	8
”	Profit and Loss account	120	1,408	5	7			
	To A.B., Capital account	1				1,408	5	7
	A.B., Captial account	1	1,500	0	0			
	To Drawings account	5				1,500	0	0
			£118,376	1	11	£118,376	1	11

DAY BOOK 1906

	Forward				£3761	7 8
	27th December.					
471	A. Brown,					
	492 New Street, Walworth—					
	2 doz. V.C. port	31/-	£3	2 0		
	1 ” A.C. pale brandy	49/-	2	9 0		
	28th December.				5	11 0
216	Fredk. Newton,					
	Farleigh House, Epsom—					
	1 gall. E. Pale sherry	13/6	£0	13 6		
	2 doz. O.B. Heidsieck 1892	160/-	16	0 0		
	2 gall. P. Scotch	21/-	2	2 0		
					18	15 6
408	Robert French,					
	214 High Road, Sutton—					
	6 doz. F.D. Pommard, 1899	30/-	£9	0 0		
	1 ” M.F. Margaux, 1893	66/-	3	6 0		
	2 ” A. Niersteiner	24/-	2	8 0		
					14	14 0
					£3800	8 2
					100	

With a view still further to split up the work, thus enabling a large staff to be simultaneously engaged, the ledger itself is now generally kept in sections. Thus the cash account and the bank account are frequently bound together in one separate book called the *cash book*, showing in parallel columns the movements of office cash and of cash at the bank, and by the addition of a third column for discounts the necessity of keeping an additional book of first entry as a *discount journal* may also be avoided. Of late years, however, most businesses pay all moneys received into their bankers without deduction, and pay all accounts by cheque; the necessity of an account for office cash thus no longer exists, save in connexion with petty payments, which are recorded in a separate book called the *petty cash book*. With regard to the remaining ledger accounts, personal accounts—which are the most numerous—are frequently separated from the real and nominal accounts, and are further subdivided so that customers' accounts are kept separate from the accounts of trade creditors. The customers' accounts are kept in a ledger (or, if need be, in several ledgers) called *sales ledgers*, or *sold ledgers*; while the accounts of trade creditors are similarly kept in *purchases ledgers* or *bought ledgers*. The nominal and real accounts, if together, are kept in what is called the *general ledger*; but this may be further subdivided into a *nominal ledger* and a *private ledger*. This last subdivision is, however, rarely made upon a scientific basis, for such accounts as the profit and loss account and trading account are generally kept in the private ledger although strictly speaking nominal accounts; while the bills receivable account and the bills payable account are generally kept in the nominal ledger, so as to reduce to a minimum the amount of clerical work in connexion with the private ledger, which is kept either by the principal himself or by his confidential employee. By the employment of *adjustment accounts*, which complete the double-entry record in each ledger, these various ledgers may readily be made self-balancing, thus enabling clerical errors to be localized and responsibility enforced.

Of recent years considerable attention has been devoted to further modifications of book-keeping methods with a view to reducing clerical work, increasing the speed with which results are available, and enabling them to be handled more quickly and with greater certainty. *Tabular book-keeping* is a device to achieve one or more of these ends by the substitution of books ruled with numerous columns for the more usual form. The system may be applied either to books of first entry or to ledgers. As applied to books of first-entry it enables the same book to deal conveniently with more than

Tabular book-keeping.

one class of transaction; thus if the trading of a business is divided into several departments, by providing a separate column for the sales of each department it is possible readily to arrive at separate totals for the aggregate sales of each, thus simplifying the preparation of departmental trading accounts. As applied to ledgers, the application of the system may be best described by the aid of the above example (the proceedings of the columns being given only), which shows how a very large number of personal accounts may be recorded upon a single opening of a ledger provided the number of entries to be made against each individual be few.

Reference No.	Name of Debtor.	Amount due on 1st Oct. 1906	Charges for Current Quarter.	Total Debit.	Date received.	Amount Received.	Discounts.	Allowances.	Bad Debts.	Amount due on 31st Dec. 1906	Remarks.
		£ *s. d.*	£ *s. d.*	£ *s. d.*		£ *s. d.*	£ *s. d.*	£ *s. d.*	£ *s. d.*	£ *s. d.*	

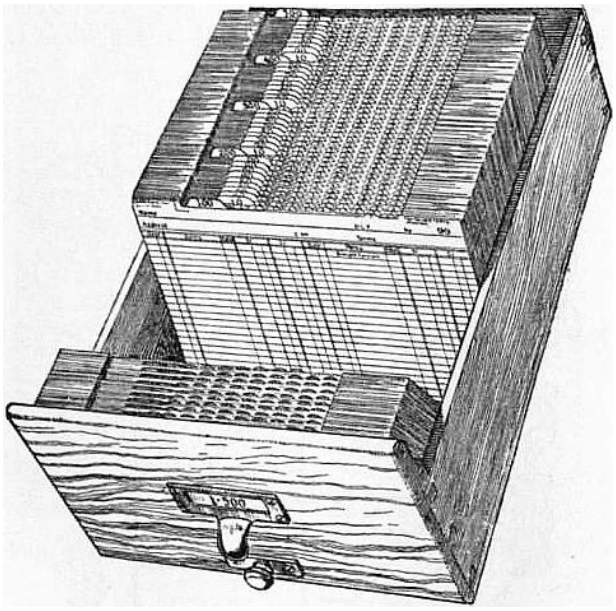


FIG. 1.—Card-Ledger Tray (Libry Bureau System).

Another important application of modern methods consists of what may be described as the *slip system*, which is in many respects a reversion to the method of keeping records upon movable slabs or tablets, as in the Babylonian accounts referred to at the beginning of this article. This system may be applied to books of first-entry, or to ledgers, or to both. As applied to books of first-entry it aims at so modifying the original record of the transaction—whether it represents an invoice for goods sold or an acknowledgment given for money received—that a facsimile duplicate may be taken of the original entry by the aid of a carbon sheet, which instead of being immovably bound up in a book is capable of being handled separately and placed in any desired order or position, and thus more readily recorded in the ledger. Postings are thus made direct from the original slips, which have been first sorted out into an order convenient for that purpose, and afterwards resorted so that the total sales of each department may be readily computed; after which they are filed away in a form convenient for reference. Sometimes the process is carried a step further, and the original slips, filed away with suitable guide-cards indicating the nature of the account, themselves constitute the ledger record—which in such cases is to be found scattered over a number of sheets, one for each transaction, instead of, as in the case of the ordinary book ledger, a considerable number of transactions being recorded upon a single page. This adaptation of the slip system is impracticable except in cases where the transactions with each individual are few in number, and is not worth adoption unless the exceedingly large number of personal accounts makes it important as far as possible to avoid all duplication of clerical work. The more usual adaptation of the slip system to ledgers is to be found in the employment of *card ledgers* or *loose-leaf ledgers*. With card ledgers (fig. 1) each ledger account is upon an independent sheet of cardboard suitably arranged in drawers or cabinets. The system is advantageous as allowing all dead matter to be eliminated from the record continuously in use, and as permitting the order in which the accounts stand to be varied from time to time as convenience dictates, thus (if necessary) enabling the accounts to be always kept in alphabetical order in spite of the addition of new accounts and the dropping out of old ones. An especial convenience of the card system is that in times of pressure any desired number of book-keepers may be simultaneously employed, whereas the maximum number that can be usefully employed upon any bound book is two. The loose-leaf ledger (fig. 2) may be described as midway between card and bound ledgers. It consists of a number of sheets in book form, so bound as to be capable of being readily separated when desired. The loose-leaf ledger thus embraces most of the advantages of the card ledger, while remaining sufficiently like the more old-fashioned book ledger as to enable it to be readily handled by those whose previous experience has been confined to the latter. Both the card and loose-leaf systems will be frequently found of value for records in connexion with cost and stores accounts, quite irrespective of their advantages in connexion with the book-keeping records pure and simple of certain businesses.

Slip system.

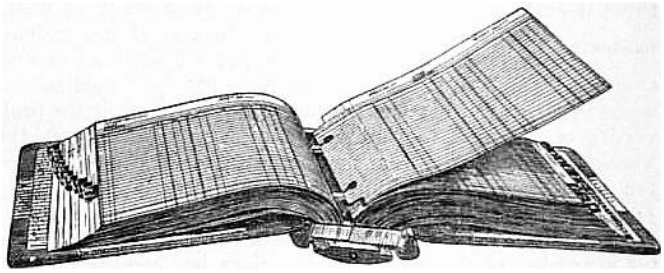


FIG. 2.—Loose-Leaf Ledger (Library Bureau System.)

All book-keeping methods rest upon the same fundamental principles, but their development in practice in different countries is to some extent influenced by the manner in which business is there conducted, and by the legislative requirements imposed by the several states. In France traders are required by the Code of Commerce to keep three books—a journal, an inventory and a letter book, somewhat elaborate provisions being made to identify these books, and to prevent substitution. The compulsory journal makes the employment of numerous books of first-entry impossible without an undesirable amount of duplication, and wherever this provision obtains the book-keeping methods are in an accordingly comparatively backward state. The inventory book comprises periodical lists of ledger balances and the balance sheet, records which are invariably kept under every adequate system, although not always in a book specially set aside for that purpose. In Germany the statutory requirements are similar to those in France, save that the journal is not compulsory; but there is an additional provision that the accounts are to be kept in *bound* books with the pages numbered consecutively—a requirement which makes the introduction of card or loose-leaf ledgers of doubtful legality. A balance sheet must be drawn up every year; but where a stock-in-trade is from its nature or its size difficult to take, it is sufficient for an inventory to be taken every two years. In Belgium the law requires every merchant to keep a journal recording his transactions from day to day, which (with the balance book) must be initialled by a prescribed officer. All letters and telegrams received, and copies of all such sent, must be preserved for ten years. The Commercial Code of Spain requires an inventory, journal, ledger, letter book and invoice book to be kept; while that of Portugal prescribes the use of a balance book, journal, ledger and copy-letter book. The law of Holland requires business men to keep books in which are correctly recorded their commercial transactions, letters received and copies of letters sent. It also provides for the preparation of an annual balance sheet. The law of Rumania makes the employment of journal, inventory book and ledger compulsory, a small tax per page being charged on the two first named. There are no special provisions as to book-keeping contained in the Russian law, nor in the United States law, but in Russia public companies have to supply the government with copies of their annual accounts, which are published in a state newspaper, and in the United States certain classes of companies have to submit their accounts to an official audit. In general terms it may be stated that at the present time the employment of card and loose-leaf ledger systems is more general in the United States than in Great Britain.

Legislative Requirements.

Apart from the organizations of professional accountants, there is none of note devoted to the scientific study of book-keeping other than purely educational institutions. Among the universities those in the United States were the first to include accounting as part of their curriculum; while in Great Britain the London School of Economics (university of London), the university of Birmingham, and the Victoria University of Manchester have, so far, alone treated the subject seriously and upon adequate lines. Quite recently Japan has been making a movement in the same direction, and other countries will doubtless follow suit. In England there have for a number of years past been various bodies—such for instance as the Society of Arts, the London Chamber of Commerce and Owens College, Manchester—which hold examinations in book-keeping and grant diplomas to successful candidates, while most of the polytechnics and technical schools give instruction in book-keeping; these latter, however, for the most part regard it as a "craft" merely.

Education.

AUTHORITIES.—Those interested in the bibliography of book-keeping are referred to the catalogue of the library of the Institute of Chartered Accountants in England and Wales, which probably contains the most complete collection in existence of ancient and modern works on accounting, both British and foreign. The following short list comprises those most likely to be found of general interest: G. van de Linde, *Book-keeping* (1898); L.R. Dicksee, *Book-keeping* (5th ed., 1906) and *Advanced Accounting* (2nd ed., 1905); *Encyclopaedia of Accounting*, ed. by G. Lisle (1903); *Accountants' Library*, ed. by the editor of *The Accountant* (1901); J.W. Heaps, *The Antiquity of Book-keeping* (1898); *History of Accounting and Accountants*, ed. by R. Brown (1905).

(L. R. D.)

BOOK-PLATES. The book-plate, or *ex-libris*, a printed label intended to indicate ownership in individual volumes, is nearly as old as the printed book itself. It bears very much the same relation to the hand-painted armorial or otherwise symbolical personal device found in medieval manuscripts that the printed page does to the scribe's work. The earliest known examples of book-plates are German. According to Friedrich Warnecke, of Berlin (one of the best authorities on the subject), the oldest movable *ex-libris* are certain woodcuts representing a shield of arms supported by an angel (fig. 1), which were pasted in books presented to the Carthusian monastery of Buxheim by Brother Hildebrand Brandenburg of Biberach, about the year 1480—the date being fixed by that of the recorded gift. The woodcut, in imitation of similar devices in old MSS., is hand-painted. In France the most ancient *ex-libris* as yet discovered is that of one Jean Bertaud de la Tour-Blanche, the date of which is 1529; and in England that of Sir Nicholas Bacon, a gift-plate for the books he presented to the university of Cambridge (fig. 2). Holland comes next with the plate of a certain Anna van der Aa, in 1597; then Italy with one attributed to the year 1622. The earliest known American example is the plain printed label of one John Williams, 1679.

Fig. 1.—Gift-plate of Hildebrand Brandenburg of Biberach to the Monastery of Buxheim (*c.* 1480).

Fig. 2.—Book-plate of Sir Nicholas Bacon (slightly reduced).

A sketch of the history of the book-plate, either as a minor work of symbolical and decorative art, or as an accessory to the binding of books, must obviously begin in Germany, not only because the earliest examples known are German, but also because they are found in great numbers long before the fashion spread to other countries, and are often of the highest artistic interest. Albrecht Dürer is known to have actually engraved at least six plates (some of very important size) between 1503 and 1516 (fig. 3), and to have supplied designs for many others. Several notable plates are ascribed to Lucas Cranach and to Hans Holbein, and to that bevy of so-called Little Masters, the Behams, Virgil Solis, Matthias Zundt, Jost Amman, Saldörfer, Georg Hüpschmann and others. The influence of these draughtsmen over the decorative styles of Germany has been felt through subsequent centuries down to the present day, notwithstanding the invasion of successive Italian and French fashions during the 17th and 18th centuries, and the marked effort at originality of composition observable among modern designers. The heavy, over-elaborated German style never seems to have affected neighbouring countries; but since it was undoubtedly from Germany that was spread the fashion of ornamental book-plates as marks of possession, the history of German *ex-libris* remains on that account one of high interest to all those who are curious in the matter.

FIG. 3.—Book-plate of Lazarus Spengler, by Albrecht Dürer, 1515 (reduced).

It was not before the 17th century that the *movable ex-libris* became tolerably common in France. Up to that time the more luxurious habit of stamping the cover with a personal device had been in such general favour with book-owners as to render the use of labels superfluous. From the middle of the century, however, the *ex-libris* proper became quite naturalized; examples of that period are very numerous, and, as a rule, are very handsome. It may be here pointed out that the expression *ex-libris*, used as a substantive, which is now the recognized term for book-plate everywhere on the continent, found its origin in France. The words only occur in the personal tokens of other nationalities long after they had become a recognized inscription on French labels.

In many ways the consideration of the English book-plate, in its numerous styles, from the late Elizabethan to the late Victorian period, is peculiarly interesting. In all its varieties it reflects with great fidelity the prevailing taste in decorative art at different epochs. Of English examples, none thus far seems to have been discovered of older date than the gift-plate of Sir Nicholas Bacon; for the celebrated, gorgeous, hand-painted armorial device attached to a folio that once belonged to Henry VIII., and now reposes in the King's library, British Museum, does not come under the head of book-plate in its modern sense. The next is that of Sir Thomas Tresham, dated 1585. Until the last quarter of the 17th century the number of authentic English plates is very limited. Their composition is always remarkably simple, and displays nothing of the German elaborateness. They are as a rule very plainly armorial, and the decoration is usually limited to a symmetrical arrangement of mantling, with an occasional display of palms or wreaths. Soon after the Restoration, however, a book-plate seems to have suddenly become an established accessory to most well-ordered libraries. Book-plates of that period offer very distinctive characteristics. In the simplicity of their heraldic arrangements they recall those of the previous age; but their physiognomy is totally different. In the first place, they invariably display the tincture lines and dots, after the method originally devised in the middle of the century by Petra Sancta, the author of *Tesserae Gentilitiae*, which by this time had become adopted throughout Europe. In the second, the mantling assumes a much more elaborate appearance—one that irresistibly recalls that of the periwig of the period—surrounding the face of the shield. This style was undoubtedly imported from France, but it assumed a character of its own in England. As a matter of fact, thenceforth until the dawn of the French Revolution, English modes of decoration in book-plates, as in most other chattels, follow at some years' distance the ruling French taste. The main characteristics of the style which prevailed during the Queen Anne and early Georgian periods are:—ornamental frames suggestive of carved oak, a frequent use of fish-scales, trellis or diapered patterns, for the decoration of plain surfaces; and, in the armorial display, a marked reduction in the importance of the mantling. The introduction of the scallop-shell as an almost constant element of ornamentation gives already a foretaste of the *Rocaille-Coquille*, the so-called Chippendale fashions of the next reign. As a matter of fact, during the middle third of the century this rococo style (of which the Convers plate [fig. 4] gives a tolerably typical sample) affects the book-plate as universally as all other decorative objects. Its chief element is a fanciful arrangement of scroll and shell work with curveting acanthus-like sprays—an arrangement which in the examples of the best period is generally made asymmetrical in order to give freer scope for a variety of countercurves. Straight or concentric lines and all appearances of flat surface are studiously avoided; the helmet and its symmetrical mantling tends to disappear, and is replaced by the plain crest on a fillet. The earlier examples of this manner are tolerably ponderous and simple. Later, however, the composition becomes exceedingly light and complicated; every conceivable and often incongruous element of decoration is introduced, from cupids to dragons, from flowerets to Chinese pagodas. During the early part of George III.'s reign there is a return to greater sobriety of ornamentation, and a style more truly national, which may be called *the urn style*, makes its appearance. Book-plates of this period have invariably a physiognomy which at once recalls the decorative manner made popular by architects and designers such as Chambers, the Adams, Josiah Wedgwood, Hepplewhite and Sheraton. The shield shows a plain spade-like outline, manifestly based upon that of the pseudo-classic urn then so much to the fore. The ornamental accessories are symmetrical palms and sprays,

wreaths and ribands. The architectural boss is also an important factor. In many plates, indeed, the shield of arms takes quite a subsidiary position by the side of the predominantly architectural urn. From the beginning of the 19th century, until comparatively recent days, no special style of decoration seems to have established itself. The immense majority of examples display a plain shield of arms with motto on a scroll below, and crest on a fillet above. Of late years, however, a rapid impetus appears to have been given to the designing of *ex-libris*; a new era, in fact, has begun for the book-plate, one of great interest.

FIG. 4.—Book-plate of P.A. Convers, 1762.

FIG. 5.—Book-plate of Francis Gwyn of Lansanor, 1698.

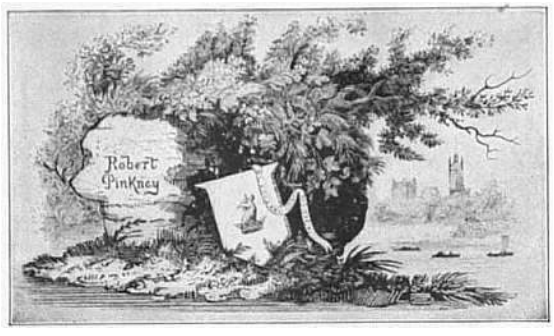
The main styles of decoration (and these, other data being absent, must always in the case of old examples remain the criteria of date) have already been noticed. It is, however, necessary to point out that certain styles of composition were also prevalent at certain periods. Many of the older plates (like the majority of the most modern ones) were essentially pictorial. Of this kind the best-defined English genus may be recalled: *the library interior*—a term which explains itself—and *book-piles*, exemplified by the *ex-libris* (fig. 6) of W. Hewer, Samuel Pepys's secretary. We have also many *portrait-plates*, of which, perhaps, the most notable are those of Samuel Pepys himself and of John Gibbs, the architect; *allegories*, such as were engraved by Hogarth, Bartolozzi, John Pine and George Vertue; *landscape-plates*, by wood engravers of the Bewick school (see Plate), &c. In most of these the armorial element plays but a secondary part.

FIG. 6.—Book-plate of William Hewer, 1699.

The value attached to book-plates, otherwise than as an object of purely personal interest, is comparatively modern. The study of and the taste for collecting these private tokens of book-ownership hardly date farther back than the year 1875. The first real impetus was given by the appearance of the *Guide to the Study of Book-Plates*, by Lord de Tabley (then the Hon. Leicester Warren) in 1880. This work, highly interesting from many points of view, established what is now accepted as the general classification of styles: *early armorial* (*i.e.* previous to Restoration, exemplified by the Nicholas Bacon plate); *Jacobean*, a somewhat misleading term, but distinctly understood to include the heavy decorative manner of the Restoration, Queen Anne and early Georgian days (the Lansanor plate, fig. 5, is typically Jacobean); *Chippendale* (the style above described as *rococo*, tolerably well represented by the French plate of Convers); *wreath and ribbon*, belonging to the period described as that of the urn, &c. Since then the literature on the subject has grown considerably. Societies of collectors have been founded, first in England, then in Germany and France, and in the United States, most of them issuing a journal or archives: *The Journal of the Ex-libris Society* (London), the *Archives de la société française de collectionneurs d'ex-libris* (Paris), both of these monthlies; the *Ex-libris Zeitschrift* (Berlin), a quarterly.

Much has been written for and against book-plate collecting. If, on the one hand, the more enthusiastic ex-librists (for such a word has actually been coined) have made the somewhat ridiculous claim of science for "ex-librisme," the bitter animadversion, on the other, of a certain class of intolerant bibliophiles upon the vandalism of removing book-plates from old books has at times been rather extravagant. Book-plates are undoubtedly very often of high interest (and of a value often far greater than the odd volume in which they are found affixed), either as specimens of bygone decorative fashion or as personal relics of well-known personages. There can be no question, for instance, that engravings or designs by artists such as Holbein and Dürer and the Little Masters of Germany, by Charles Eisen, Hubert François Bourguignon, *dit* Gravelot, D.N. Chodowiecki or Simon Gribelin; by W. Marshall, W. Faithorne, David Loggan, Sir Robert Strange, Francesco Piranesi; by Hogarth, Cipriani, Bartolozzi, John Keyse Sherwin, William Henshaw, Hewitt or Bewick and his imitators; or, to come to modern times, that the occasional examples traced to the handicraft of Thomas Stothard, Thackeray, Millais, Maclise, Bell Scott, T.G. Jackson, Walter Crane, Caldecott, Stacy Marks, Edwin Abbey, Kate Greenaway, Gordon Browne, Herbert Railton, Aubrey Beardsley, Alfred Parsons, D.Y. Cameron, Paul Avril—are worth collecting.

PLATE.

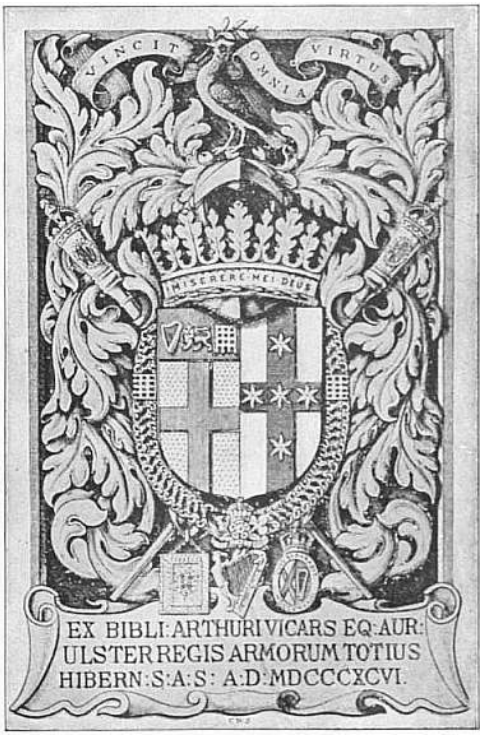


BOOK-PLATE OF ROBERT PINKNEY.

BOOK-PLATE OF FREIHERR V. LIPPERHEIDE.

By Thoma Bewick. By Karl Rickelt.

BOOK-PLATE OF CHARLES DEXTER ALLEN.
By E.D. French.



BOOK-PLATE OF SIR ARTHUR VICARS.
By C.W. Sherborn.

Until the advent of the new taste the devising of book-plates was almost invariably left to the routine skill of the heraldic stationer. Of late years the composition of personal book-tokens has become recognized as a minor branch of a higher art, and there has come into fashion an entirely new class of designs which, for all their wonderful variety, bear as unmistakable a character as that of the most definite styles of bygone days. Broadly speaking, it may be said that the purely heraldic element tends to become subsidiary and the allegorical or symbolic to assert itself more strongly. Among modern English artists who have more specially paid attention to the devising of book-plates, and have produced admirable designs, may be mentioned C.W. Sherborn, G.W. Eve, Robert Anning Bell, J.D. Batten, Erat Harrison, J. Forbes Nixon, Charles Ricketts, John Vinycomb, John Leighton and Warrington Hogg. The development in various directions of process work, by facilitating and cheapening the reproduction of beautiful and elaborate designs, has no doubt helped much to popularize the book-plate—a thing which in older days was almost invariably restricted to ancestral libraries or to collections otherwise important. Thus the great majority of modern plates are reproduced by process. There are, however, a few artists left who devote to book-plates their skill with the graver. Some of the work they produce challenges comparison with the finest productions of bygone engravers. Of these the best-known are C.W. Sherborn (see Plate) and G.W. Eve in England, and in America J.W. Spenceley of Boston, Mass., K.W.F. Hopson of New Haven, Conn., and E.D. French of New York City (see Plate).

AUTHORITIES.—The curious in the matter of book-plate composition will find it treated in the various volumes of the Ex-libris Series (London). See also A. Poulet-Malassis, *Les Ex-libris français* (1875); Hon. J. Leicester Warren (Lord de Tabley), *A Guide to the Study of Book-plates* (1880); Sir A.W. Franks, *Notes on Book-plates*, 1574-1800 (private, 1887); Friedrich Warnecke, *Die deutschen Bücherzeichen* (1890); Henri Bouchot, *Les Ex-libris et les marques de possession du livre* (1891); Egerton Castle, *English Book-plates* (1892); Walter Hamilton, *French Book-plates* (1892), *Dated Book-plates* (1895); H.W. Fincham, *Artists and Engravers of British and American Book-plates* (1897); *German Book-plates*, by Count K.E. zu Leiningen-Westerburg, translated by G.R. Denis (1901).

(E. CA.)

BOOK-SCORPION, or FALSE SCORPION, minute arachnids superficially resembling tailless scorpions and belonging to the order Pseudoscorpiones of the class Arachnida. Occurring in all temperate and tropical countries, book-scorpions live for the most part under stones, beneath the bark of trees or in vegetable detritus. A few species, however, like the common British forms *Chelifer cancroides* and *Chiridium museorum*, frequent human dwellings and are found in books, old chests, furniture, &c; others like *Ganypus littoralis* and allied species may be found under stones or pieces of coral between tide-marks; while others, which are for the most part blind, live permanently in dark caves. Their food consists of minute insects or mites. It is possibly for the purpose of feeding on parasitic mites that book-scorpions lodge themselves beneath the wing-cases of large tropical beetles; and the same explanation, in default of a better, may be extended to their well-known and oft-recorded habit of seizing hold of the legs of horse-flies or other two-winged insects. For safety during hibernation and moulting, book-scorpions spin a small spherical cocoon. They are oviparous; and the eggs after being laid are carried about by the mother, attached to the lower surface of her body, the young remaining with their parent until they have acquired their definite form and are able to shift for themselves.

BOOKSELLING. The trade in books is of a very ancient date. The early poets and orators recited their effusions in public to induce their hearers to possess written copies of their poems or orations. Frequently they were taken down *viva voce*, and transcripts sold to such as were wealthy enough to purchase. In the book of Jeremiah the prophet is represented as dictating to Baruch the scribe, who, when questioned, described the mode in which his book was written. These scribes were, in fact, the earliest booksellers, and supplied copies as they were demanded. Aristotle, we are told, possessed a somewhat extensive library; and Plato is recorded to have paid the large sum of one hundred minae for three small treatises of Philolaus the Pythagorean. When the Alexandrian library was founded about 300 B.C., various expedients were resorted to for the purpose of procuring books, and this appears to have stimulated the energies of the Athenian booksellers, who were termed βιβλìων κάπηλοι. In Rome, towards the end of the republic, it became the fashion to have a library as part of the household furniture; and the booksellers, *librarii* (Cic. *D. Leg.* iii. 20) or *bibliopolae* (Martial iv. 71, xiii. 3), carried on a flourishing trade. Their shops (*taberna librarii*, Cicero, *Phil.* ii. 9) were chiefly in the Argiletum, and in the Vicus Sandalarius. On the door, or on the side posts, was a list of the books on sale; and Martial (i. 118), who mentions this also, says that a copy of his First Book of Epigrams might be purchased for five denarii. In the time of Augustus the great booksellers were the Sosii. According to Justinian (ii. I. 33), a law was passed securing to the scribes the property in the materials used; and in this may, perhaps, be traced the first germ of the modern law of copyright.

The spread of Christianity naturally created a great demand for copies of the Gospels and other sacred books, and later on for missals and other devotional volumes for church and private use. Benedict Biscop, the founder of the abbey at Wearmouth in England, brought home with him from France (671) a whole cargo of books, part of which he had “bought,” but from whom is not mentioned. Passing by the intermediate ages we find that previous to the Reformation, the text writers or stationers (*stacyoneres*), who sold copies of the books then in use—the ABC, the Paternoster, Creed, Ave Maria and other MS. copies of prayers, in the neighbourhood of St Paul’s, London,—were, in 1403, formed into a gild. Some of these “stacyoneres” had stalls or stations built against the very walls of the cathedral itself, in the same manner as they are still to be found in some of the older continental cities. In Henry Anstey’s *Munimenta Academica*, published under the direction of the master of the rolls, we catch a glimpse of the “sworn” university bookseller or stationer, John More of Oxford, who apparently first supplied pupils with their books, and then acted the part of a pawnbroker. Anstey says (p. 77), “The fact is that they (the students) mostly could not afford to buy books, and had they been able, would not have found the advantage so considerable as might be supposed, the instruction given being almost wholly oral. The chief source of supplying books was by purchase from the university sworn stationers, who had to a great extent a monopoly. Of such books there were plainly very large numbers constantly changing hands.” Besides the sworn stationers there were many booksellers in Oxford who were not sworn; for one of the statutes, passed in the year 1373, expressly recites that, in consequence of their presence, “books of great value are sold and carried away from Oxford, the owners of them are cheated, and the sworn stationers are deprived of their lawful business.” It was, therefore, enacted that no bookseller except two sworn stationers or their deputies, should sell any book being either his own property or that of another, exceeding half a mark in value, under a pain of imprisonment, or, if the offence was repeated, of abjuring his trade within the university.

“The trade in bookselling seems,” says Hallam, “to have been established at Paris and Bologna in the 12th century; the lawyers and universities called it into life. It is very improbable that it existed in what we properly call the dark ages. Peter of Blois mentions a book which he had bought of a public dealer (*a quodam publico mangone librorum*); but we do not find many distinct accounts of them till the next age. These dealers were denominated *stationarii*, perhaps from the open stalls at which they carried on their business, though *statio* is a general word for a shop in low Latin. They appear, by the old statutes of the university of Paris, and by those of Bologna, to have sold books upon commission, and are sometimes, though not uniformly, distinguished from the *librarii*, a word which, having originally been confined to the copyists of books, was afterwards applied to those who traded in them. They sold parchment and other materials of writing, which have retained the name of stationery, and they naturally exercised the kindred occupations of binding and decorating. They probably employed transcribers; we find at least that there was a profession of copyists in the universities and in large cities.” 234

The modern system of bookselling dates from soon after the introduction of printing. The earliest printers were also editors and booksellers; but being unable to sell every copy of the works they printed, they had agents at most of the seats of learning. Antony Koburger, who introduced the art of printing into Nuremberg in 1470, although a printer, was more of a bookseller; for, besides his own sixteen shops, we are informed by his biographers that he had agents for the sale of his books in every city of Christendom. Wynkyn de Worde, who succeeded to Caxton’s press in Westminster, had a shop in Fleet Street.

The religious dissensions of the continent, and the Reformation in England under Henry VIII. and Edward VI., created a great demand for books; but in England neither Tudor nor Stuart could tolerate a free press, and various efforts were made to curb it. The first patent for the office of king’s printer was granted to Thomas Berthelet by Henry VIII. in 1529, but only such books as were first licensed were to be printed. At that time even the purchase or possession of an unlicensed book was a punishable offence. In 1556 the Company of Stationers was incorporated, and very extensive powers were granted in order that obnoxious books might be repressed. In the following reigns the Star Chamber exercised a pretty effectual censorship; but, in spite of all precaution, such was the demand for books of a polemical nature, that many were printed abroad and surreptitiously introduced into England. Queen Elizabeth interfered but little with books except when they emanated from Roman Catholics, or touched upon her royal prerogatives; and towards the end of her reign, and during that of her pedantic successor, James, bookselling flourished. Archbishop Laud, who was no friend to booksellers, introduced many arbitrary restrictions; but they were all, or nearly all, removed during the time of the Commonwealth. So much had bookselling increased during the Protectorate that, in 1658, was published *A*

Catalogue of the most Vendible Books in England, digested under the heads of Divinity, History, Physic, &c., with School Books, Hebrew, Greek and Latin, and an Introduction, for the use of Schools, by W. London. A bad time immediately followed. The Restoration also restored the office of Licenser of the Press, which continued till 1694.

In the first English Copyright Act (1709), which specially relates to booksellers, it is enacted that, if any person shall think the published price of a book unreasonably high, he may thereupon make complaint to the archbishop of Canterbury, and to certain other persons named, who shall thereupon examine into his complaint, and if well founded reduce the price; and any bookseller charging more than the price so fixed shall be fined £5 for every copy sold. Apparently this enactment remained a dead letter.

For later times it is necessary to make a gradual distinction between *booksellers*, whose trade consists in selling books, either by retail or wholesale, and *publishers*, whose business involves the production of the books from the author's manuscripts, and who are the intermediaries between author and bookseller, just as the booksellers (in the restricted sense) are intermediaries between the author and publisher and the public. The article on PUBLISHING (*q.v.*) deals more particularly with this second class, who, though originally booksellers, gradually took a higher rank in the book-trade, and whose influence upon the history of literature has often been very great. The convenience of this distinction is not impaired by the fact either that a publisher is also a wholesale bookseller, or that a still more recent development in publishing (as in the instance of the direct sale in 1902, by the London *Times*, of the supplementary volumes to the 9th edition of the *Encyclopaedia Britannica*, which were also "published" by *The Times*) started a reaction to some extent in the way of amalgamating the two functions. The scheme of *The Times* Book Club (started in 1905) was, again, a combination of a subscription library with the business of bookselling (see NEWSPAPERS); and it brought the organization of a newspaper, with all its means of achieving publicity, into the work of pushing the sale of books, in a way which practically introduced a new factor into the bookselling business.

During the 19th century it remains the fact that the distinction between publisher and bookseller—literary promoter and shopkeeper—became fundamental. The booksellers, as such, were engaged either in wholesale bookselling, or in the retail, the old or second-hand, and the periodical trades.

> Coming between the publisher and the retail bookseller is the important distributing agency of the *wholesale bookseller*. It is to him that the retailer looks for his miscellaneous supplies, as it is simply impossible for him to stock one-half of the books published. In Paternoster Row, London, which has for over a hundred years been the centre of this industry, may be seen the collectors from the shops of the retail booksellers, busily engaged in obtaining the books ordered by the book-buying public. It is also through these agencies that the country bookseller obtains his miscellaneous supplies. At the leading house in this department of bookselling almost any book can be found, or information obtained concerning it. At one of these establishments over 1,000,000 books are constantly kept in stock. It is here that the publisher calls first on showing or "subscribing" a new book, a critical process, for by the number thus subscribed the fate of a book is sometimes determined.
>
> What may be termed the third partner in publishing and its ramification is the *retail bookseller*; and to protect his interests there was established in 1890 a London booksellers' society, which had for its object the restriction of discounts to 25%, and also to arrange prices generally and control all details connected with the trade. The society a few years afterwards widened its field of operations so as to include the whole of the United Kingdom, and its designation then became "The Associated Booksellers of Great Britain and Ireland."
>
> The trade in old or (as they are sometimes called) second-hand books is in a sense, no doubt, a higher class of business, requiring a knowledge of bibliography, while the transactions are with individual books rather than with numbers of copies. Occasionally dealers in this class of books replenish their stocks by purchasing remainders of books, which, having ceased from one cause or another to sell with the publisher, they offer to the public as bargains. The periodical trade grew up during the 19th century, and was in its infancy when the *Penny Magazine*, *Chambers's Journal*, and similar publications first appeared. The growth of this important part of the business was greatly promoted by the abolition of the newspaper stamp and of the duty upon paper, the introduction of attractive illustrations, and the facilities offered for purchasing books by instalments.

The history of bookselling in America has a special interest. The Spanish settlements drew away from the old country much of its enterprise and best talent, and the presses of Mexico and other cities teemed with publications mostly of a religious character, but many others, especially linguistic and historical, were also published. Bookselling in the United States was of a somewhat later growth, although printing was introduced into Boston as early as 1676, Philadelphia in 1685, and New York in 1693. Franklin had served to make the trade illustrious, yet few persons were engaged in it at the commencement of the 19th century. Books chiefly for scholars and libraries were imported from Europe; but after the second war printing-presses multiplied rapidly, and with the spread of newspapers and education there also arose a demand for books, and publishers set to work to secure the advantages offered by the wide field of English literature, the whole of which they had the liberty of reaping free of all cost beyond that of production. The works of Scott, Byron, Moore, Southey, Wordsworth, and indeed of every author of note, were reprinted without the smallest payment to author or proprietor. Half the names of the authors in the so-called "American" catalogue of books printed between 1820 and 1852 are British. By this means the works of the best authors were brought to the doors of all classes in the cheapest variety of forms. In consequence of the Civil War, the high price of labour, and the restrictive duties laid on in order to protect native industry, coupled with the frequent intercourse with England, a great change took place, and American publishers and booksellers, while there was still no international copyright, made liberal offers for early sheets of new publications. Boston, New York and Philadelphia still retained their old supremacy as bookselling centres. Meanwhile, the distinct publishing business also grew, till gradually the conditions of business became assimilated to those of Europe.

In the course of the 16th and 17th centuries the Low Countries for a time became the chief centre of the bookselling world, and many of the finest folios and quartos in our libraries bear the names of Jansen, Blauw or Plantin, with the imprint of Amsterdam, Utrecht, Leiden or Antwerp, while the Elzevirs besides other works produced their charming little pocket classics. The southern towns of Douai and St Omer at the same time furnished polemical works in English.

> Under PUBLISHING are noticed various further developments of this subject. Much interesting information on the history of the book trade will be found in Charles Knight's *Biography of William Caxton*, and in the same

author's *Shadows of the Old Booksellers* (1865). See also Henry Curwen, *History of Booksellers* (1873); and Heinrich Lempertz, *Bilder-Hefte zur Geschichte des Bücherhandels* (Cologne, 1854).

BOOLE, GEORGE (1815-1864), English logician and mathematician, was born in Lincoln on the 2nd of November 1815. His father was a tradesman of limited means, but of studious character and active mind. Being especially interested in mathematical science, the father gave his son his first lessons; but the extraordinary mathematical powers of George Boole did not manifest themselves in early life. At first his favourite subject was classics. Not until the age of seventeen did he attack the higher mathematics, and his progress was much retarded by the want of efficient help. When about sixteen years of age he became assistant-master in a private school at Doncaster, and he maintained himself to the end of his life in one grade or other of the scholastic profession. Few distinguished men, indeed, have had a less eventful life. Almost the only changes which can be called events are his successful establishment of a school at Lincoln, its removal to Waddington, his appointment in 1849 as professor of mathematics in the Queen's College at Cork, and his marriage in 1855 to Miss Mary Everest, who, as Mrs Boole, afterwards wrote several useful educational works on her husband's principles.

To the public Boole was known only as the author of numerous abstruse papers on mathematical topics, and of three or four distinct publications which have become standard works. His earliest published paper was one upon the "Theory of Analytical Transformations," printed in the *Cambridge Mathematical Journal* for 1839, and it led to a friendship between Boole and D.F. Gregory, the editor of the journal, which lasted until the premature death of the latter in 1844. A long list of Boole's memoirs and detached papers, both on logical and mathematical topics, will be found in the *Catalogue of Scientific Memoirs* published by the Royal Society, and in the supplementary volume on *Differential Equations*, edited by Isaac Todhunter. To the *Cambridge Mathematical Journal* and its successor, the *Cambridge and Dublin Mathematical Journal*, Boole contributed in all twenty-two articles. In the third and fourth series of the *Philosophical Magazine* will be found sixteen papers. The Royal Society printed six important memoirs in the *Philosophical Transactions*, and a few other memoirs are to be found in the *Transactions of the Royal Society of Edinburgh* and of the *Royal Irish Academy*, in the *Bulletin de l'Académie de St-Pétersbourg* for 1862 (under the name G. Boldt, vol. iv. pp. 198-215), and in *Crelle's Journal*. To these lists should be added a paper on the mathematical basis of logic, published in the *Mechanic's Magazine* for 1848. The works of Boole are thus contained in about fifty scattered articles and a few separate publications.

Only two systematic treatises on mathematical subjects were completed by Boole during his lifetime. The well-known *Treatise on Differential Equations* appeared in 1859, and was followed, the next year, by a *Treatise on the Calculus of Finite Differences*, designed to serve as a sequel to the former work. These treatises are valuable contributions to the important branches of mathematics in question, and Boole, in composing them, seems to have combined elementary exposition with the profound investigation of the philosophy of the subject in a manner hardly admitting of improvement. To a certain extent these works embody the more important discoveries of their author. In the 16th and 17th chapters of the *Differential Equations* we find, for instance, a lucid account of the general symbolic method, the bold and skilful employment of which led to Boole's chief discoveries, and of a general method in analysis, originally described in his famous memoir printed in the *Philosophical Transactions* for 1844. Boole was one of the most eminent of those who perceived that the symbols of operation could be separated from those of quantity and treated as distinct objects of calculation. His principal characteristic was perfect confidence in any result obtained by the treatment of symbols in accordance with their primary laws and conditions, and an almost unrivalled skill and power in tracing out these results.

During the last few years of his life Boole was constantly engaged in extending his researches with the object of producing a second edition of his *Differential Equations* much more complete than the first edition; and part of his last vacation was spent in the libraries of the Royal Society and the British Museum. But this new edition was never completed. Even the manuscripts left at his death were so incomplete that Todhunter, into whose hands they were put, found it impossible to use them in the publication of a second edition of the original treatise, and wisely printed them, in 1865, in a supplementary volume.

With the exception of Augustus de Morgan, Boole was probably the first English mathematician since the time of John Wallis who had also written upon logic. His novel views of logical method were due to the same profound confidence in symbolic reasoning to which he had successfully trusted in mathematical investigation. Speculations concerning a calculus of reasoning had at different times occupied Boole's thoughts, but it was not till the spring of 1847 that he put his ideas into the pamphlet called *Mathematical Analysis of Logic*. Boole afterwards regarded this as a hasty and imperfect exposition of his logical system, and he desired that his much larger work, *An Investigation of the Laws of Thought, on which are founded the Mathematical Theories of Logic and Probabilities* (1854), should alone be considered as containing a mature statement of his views. Nevertheless, there is a charm of originality about his earlier logical work which no competent reader can fail to appreciate. He did not regard logic as a branch of mathematics, as the title of his earlier pamphlet might be taken to imply, but he pointed out such a deep analogy between the symbols of algebra and those which can be made, in his opinion, to represent logical forms and syllogisms, that we can hardly help saying that logic is mathematics restricted to the two quantities, 0 and 1. By unity Boole denoted the universe of thinkable objects; literal symbols, such as *x, y, z, v, u*, &c., were used with the elective meaning attaching to common adjectives and substantives. Thus, if x = horned and y = sheep, then the successive acts of election represented by x and y, if performed on unity, give the whole of the class *horned sheep*. Boole showed that elective symbols of this kind obey the same primary laws of combination as algebraical symbols, whence it followed that they could be added, subtracted, multiplied and even divided, almost exactly in the same manner as numbers. Thus, $1 - x$ would represent the operation of selecting all things in the world except *horned things*, that is, *all not horned things*, and $(1 - x)(1 - y)$ would give us *all things neither horned nor sheep*. By the use of such symbols propositions could be reduced to the form of equations, and the syllogistic conclusion from two premises was

obtained by eliminating the middle term according to ordinary algebraic rules.

Still more original and remarkable, however, was that part of his system, fully stated in his *Laws of Thought*, which formed a general symbolic method of logical inference. Given any propositions involving any number of terms, Boole showed how, by the purely symbolic treatment of the premises, to draw any conclusion logically contained in those premises. The second part of the *Laws of Thought* contained a corresponding attempt to discover a general method in probabilities, which should enable us from the given probabilities of any system of events to determine the consequent probability of any other event logically connected with the given events.

Though Boole published little except his mathematical and logical works, his acquaintance with general literature was wide and deep. Dante was his favourite poet, and he preferred the *Paradiso* to the *Inferno*. The metaphysics of Aristotle, the ethics of Spinoza, the philosophical works of Cicero, and many kindred works, were also frequent subjects of study. His reflections upon scientific, philosophical and religious questions are contained in four addresses upon *The Genius of Sir Isaac Newton*, *The Right Use of Leisure*, *The Claims of Science* and *The Social Aspect of Intellectual Culture*, which he delivered and printed at different times.

The personal character of Boole inspired all his friends with the deepest esteem. He was marked by the modesty of true genius, and his life was given to the single-minded pursuit of truth. Though he received a medal from the Royal Society for his memoir of 1844, and the honorary degree of LL.D. from the university of Dublin, he neither sought nor received the ordinary rewards to which his discoveries would entitle him. On the 8th of December 1864, in the full vigour of his intellectual powers, he died of an attack of fever, ending in suffusion on the lungs.

An excellent sketch of his life and works, by the Rev. R. Harley, F.R.S., is to be found in the *British Quarterly Review* for July 1866, No. 87.

(W. S. J.)

BOOM, a word of Teutonic origin (cf. the Ger. *Baum*, tree, and the Eng. *beam*) for a pole, bar or barrier, used especially as a nautical term, for a long spar, used to extend a sail at the foot (main-boom, jib-boom, &c.). The “boom” of a cannon (note of a bell, cry of the bittern) is distinct from this, being onomatopoeic. In the sense of a barrier, a boom is generally formed of timber lashed together, or of chains, built across the mouth of a river or harbour as a means of defence. Possibly from the metaphor of a breaking boom, and the accompanying rush and roar, or from the rush of rising waters (mingled with the onomatopoeic use), “boom” began in America to be used of a sudden “spurt” or access of industrial activity, as in the phrase “a boom in cotton.” Hence the verb “to boom,” meaning to advertise or push into public favour.

BOOMERANG, a missile weapon of the Australian aborigines and other peoples. The word is taken from the native name used by a single tribe in New South Wales, and was mentioned in 1827 by Captain King as “the Port Jackson term” (*Nav. Surv. Coasts Austral.* i. 355) It has been erroneously connected with the *womera* or spear-thrower, and equally erroneously regarded as onomatopoeic—for it does not “boom” but whistles in the air. Two main types may be distinguished: (*a*) the return boomerang; (*b*) the non-return or war boomerang. Both types are found in most parts of Australia; the return form was, according to General Pitt-Rivers, used in ancient Egypt; and a weapon which has a close resemblance to the boomerang survives to the present day in North-East Africa, whence it has spread in allied forms made of metal (throwing knives). Among the Dravidians of South India is found a boomerang-shaped instrument which can be made to return. It is, however, still uncertain whether the so-called boomerangs of Egypt and India have any real resemblance to the Australian return boomerang. The Hopis (Moquis) of Arizona use a non-return form. The general form of both weapons is the same. They are sickle-shaped, and made of wood (in India of ivory or steel), so modelled that the thickness is about $\frac{1}{6}$th of the breadth, which again is $\frac{1}{12}$th of the length, the last varying from 6 in. to 3 or 4 ft. The return boomerang, which may have two straight arms at an angle of from 70° to 120°, but in Australia is always curved at an angle of 90° or more, is usually 2 to 3 ft. in length and weighs some 8 oz.; the arms have a skew, being twisted 2° or 3° from the plane running through the centre of the weapon, so that B and D (fig. 1) are above it, A and E below it; the ends AB and DE are also to some extent raised above the plane of the weapon at C; the cross section is asymmetrical, the upper side in the figure being convex, the lower flat or nearly so; this must be thrown with the right hand. The non-return boomerang has a skew in the opposite direction but is otherwise similar.

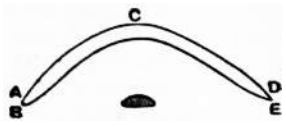


Fig. 1.

The peculiarity of the boomerang’s flight depends mainly on its skew. The return boomerang is held vertically, the concave side forward, and thrown in a plane parallel to the surface of the ground, as much rotation as possible being imparted to it. It travels straight for 30 yds. or more, with nearly vertical rotation; then it inclines to the left, lying over on the flat side and rising in the air; after describing a circle of 50 or more yards in diameter it returns to the thrower. Some observers state that it returns after striking the object; it is certainly possible to strike the ground without affecting the return. Throws of 100 yds. or more, before the leftward curve begins, can be accomplished by Australian natives, the weapon rising as much as 150 ft. in the air and circling five times before returning. The non-return type may also be made to return in a nearly straight line by throwing it at an angle of 45°, but normally it is thrown like the return type, and will then travel an immense distance. No accurate measurements of Australian throws are available, but an English throw of 180 yds. has been recorded, compared with the same thrower’s 70 yds. with the cricket ball.

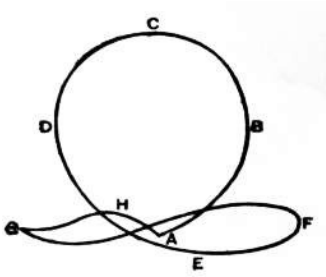


FIG. 2.—Flight in Horizontal Plane.

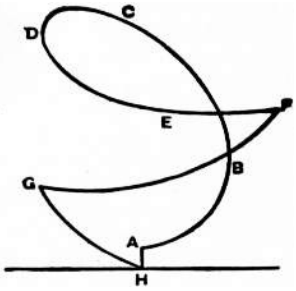


FIG. 3.—Flight in Vertical Plane.

The war boomerang in an expert's hand is a deadly weapon, and the lighter hunting boomerang is also effective. The return boomerang is chiefly used as a plaything or for killing birds, and is often as dangerous to the thrower as to the object at which it is aimed.

See Pitt-Rivers (Lane Fox) in *Anthropological and Archaeological Fragments*, "Primitive Warfare"; also in *Journ. Royal United Service Inst.* xii. No. 51; *British Ass. Report* (1872); *Catalogue of Bethnal Green Collection*, p. 28; Buchner in *Globus*, lxxxviii. 39, 63; G.T. Walker in *Phil. Trans.* cxc. 23; *Wide World Mag.* ii. 626; *Nature*, xiv. 248, lxiv. 338; Brough Smyth, *Aborigines of Victoria*, i. 310-329; Roth, *Ethnological Studies*.

(N. W. T.)

BOONE, DANIEL (1734-1820), American pioneer and backwoodsman, of English descent, was born near the present city of Reading, Pennsylvania, on the 2nd of November (N.S.) 1734. About 1751 his father, Squire Boone, with his family settled in the Yadkin Valley in what is now Davie county, North Carolina, then on the frontier. Daniel worked on his father's farm, and spent much of his time hunting and trapping. In 1755 he served as a wagoner and blacksmith in Braddock's disastrous expedition against the Indians. In 1765 he visited Florida, and in 1767 he first visited the Kentucky region. With several companions, including John Finley, who had been there as early as 1752, he spent two years, 1769-1771, roaming about what is now Kentucky, meeting with numberless adventures, coming in conflict with roving bands of Indians, and collecting bear, beaver and deer skins. He served in Lord Dunmore's War (1774), and in 1775 led to Kentucky the party of settlers who founded Boonesborough, long an important settlement. On the 7th of February 1778 he, and the party he led, were captured by a band of Shawnees. He was adopted into the Shawnee tribe, was taken to Detroit, and on the return from that place escaped, reaching Boonesborough, after a perilous journey of 160 m., within four days, in time to give warning of a formidable attack by his captors. In repelling this attack, which lasted from the 8th to the 17th of September, he bore a conspicuous part. He also took part in the sanguinary "Battle of Blue Licks" in 1782. For a time he represented the settlers in the Virginia legislature (Kentucky then being a part of Virginia), and he also served as deputy surveyor, sheriff and county lieutenant of Fayette county, one of the three counties into which Kentucky was then divided. Having lost all his land through his carelessness in regard to titles, he removed in 1788 to Point Pleasant, Virginia (now W. Va.), whence about 1799 he removed to a place in what is now Missouri, about 45 m. west of St Louis, in territory then owned by Spain. He received a grant of 1000 arpents (about 845 acres) of land, and was appointed syndic of the district. After the United States gained possession of "Louisiana" in 1803, Boone's title was found to be defective, and he was again dispossessed. He died on the 22nd of September 1820, and in 1845 his remains were removed to Frankfort, Kentucky, where a monument has been erected to his memory. Boone was a typical American pioneer and backwoodsman, a great hunter and trapper, highly skilled in all the arts of woodcraft, familiar with the Indians and their methods of warfare, a famous Indian fighter, restless, resourceful and fearless. His services, however, have been greatly over-estimated, and he was not, as is popularly believed, either the first to explore or the first to settle the Kentucky region.

The best biography is that by Reuben G. Thwaites, *Daniel Boone* (New York, 1902).

BOONE, a city and the county-seat of Boone county, Iowa, U.S.A., a short distance from the Des Moines river and near the centre of the state. Pop. (1890) 6520; (1900) 8880; (1905, state census) 9500 (1334 foreign-born); (1910) 10,347. It is served by the Chicago & North-Western (which has construction and repair shops here), the Chicago, Milwaukee & St Paul railways, and by the Fort Dodge, Des Moines & Southern (inter-urban) railway, which connects with Des Moines, Ames, &c. Boone is an important coal centre; bricks and tiles are manufactured from the clay obtained near by; there is a packing plant for the manufacture of beef and pork products; and from the rich farming section by which the city is surrounded come large quantities of grain, some of which is milled here, and live-stock. Boone was laid out in 1865, was incorporated as a town in 1866, and was chartered as a city in 1868.

BOONVILLE, a city and the county-seat of Cooper county, Missouri, U.S.A., on the right bank of the Missouri

river, about 210 m. W. by N. of St Louis. Pop. (1890) 4141; (1900) 4377, including 1111 negroes; (1910) 4252. It is served by the Missouri Pacific, and the Missouri, Kansas & Texas railways. The city lies along a bluff about 100 ft. above the river. It is the seat of the Missouri training school for boys (1889), and of the Kemper military school (1844). Among its manufactures are earthenware, tobacco, vinegar, flour, farm-gates (iron), sash and doors, marble and granite monuments, carriages and bricks. Iron, zinc and lead are found in the vicinity, and some coal is mined. Boonville, named in honour of Daniel Boone, was settled in 1810, was laid out in 1817, incorporated as a village in 1839, and chartered as a city of the third class in 1896. Here on the 17th of June 1861, Captain (Major-General) Nathaniel Lyon, commanding about 2000 Union troops, defeated a slightly larger, but undisciplined Confederate force under Brigadier-General John S. Marmaduke. David Barton (d. 1837), one of the first two United States senators from Missouri, was buried here.

BOORDE (or Borde), **ANDREW** (1490?-1549), English physician and author, was born at Boord's Hill, Holms Dale, Sussex. He was educated at Oxford, and was admitted a member of the Carthusian order while under age. In 1521 he was "dispensed from religion" in order that he might act as suffragan bishop of Chichester, though he never actually filled the office, and in 1529 he was freed from his monastic vows, not being able to endure, as he said, the "rugorosite off your relygyon." He then went abroad to study medicine, and on his return was summoned to attend the duke of Norfolk. He subsequently visited the universities of Orleans, Poitiers, Toulouse, Montpellier and Wittenberg, saw the practice of surgery at Rome, and went on pilgrimage with others of his nation to Compostella in Navarre. In 1534 Boorde was again in London at the Charterhouse, and in 1536 wrote to Thomas Cromwell, complaining that he was in "thraldom" there. Cromwell set him at liberty, and after entertaining him at his house at Bishops Waltham in Hampshire, seems to have entrusted him with a mission to find out the state of public feeling abroad with regard to the English king. He writes to Cromwell from various places, and from Catalonia he sends him the seeds of rhubarb, two hundred years before that plant was generally cultivated in England. Two letters in 1535 and 1536 to the prior of the Charterhouse anxiously argue for his complete release from monastic vows. In 1536 he was studying medicine at Glasgow and gathering his observations about the Scots and the "devellyshe dysposicion of a Scottysh man, not to love nor favour an Englishe man." About 1538 Boorde set out on his most extensive journey, visiting nearly all the countries of Europe except Russia and Turkey, and making his way to Jerusalem. Of these travels he wrote a full itinerary, lost unfortunately by Cromwell, to whom it was sent. He finally settled at Montpellier and before 1542 had completed his *Fyrst Boke of the Introduction of Knowledge*, which ranks as the earliest continental guide book, his *Dietary* and his *Brevyary*. He probably returned to England in 1542, and lived at Winchester and perhaps at Pevensey. John Ponet, bishop of Winchester, in an *Apology* against Bishop Gardiner, relates as matter of common knowledge that in 1547 Doctor Boord, a physician and a holy man, who still kept the Carthusian rules of fasting and wearing a hair shirt, was convicted in Winchester of keeping in his house three loose women. For this offence, apparently, he was imprisoned in the Fleet, where he made his will on the 9th of April 1549. It was proved on the 25th of the same month. Thomas Hearne (*Benedictus Abbas*, i, p. 52) says that he went round like a quack doctor to country fairs, and therefore rashly supposed him to have been the original merry-andrew.

Andrew Boorde was no doubt a learned physician, and he has left two amusing and often sensible works on domestic hygiene and medicine, but his most entertaining book is *The Fyrst Boke of the Introduction of Knowledge. The whyche dothe teache a man to speake parte of all maner of languages, and to know the usage and fashion of all maner of countreys. And for to know the moste parte of all maner of coynes of money, the whych is currant in every region. Made by Andrew Borde, of Physycke Doctor. Dedycated to the right honourable, and gracious lady Mary daughter of our soverayne Lorde Kyng Henry the eyght* (*c*. 1547). The Englishman describes himself and his foibles—his fickleness, his fondness for new fashions and his obstinacy—in lively verse. Then follows a geographical description of the country, followed by a model dialogue in the Cornish language. Each country in turn is dealt with on similar lines. His other authentic works are: *Here foloweth a Compendyous Regimente or Dyetary of health, made in Mountpyllor* (Thomas Colwell, 1562), of which there are undated and doubtless earlier editions; *The Brevyary of Health* (1547?); *The Princyples of Astronamy* (1547?); "The Peregrination of Doctor Board," printed by Thomas Hearne in *Benedictus Abbas Petroburgensis*, vol. ii. (1735); *A Pronostycacyon or an Almanacke for the yere of our lorde MCCCCCXLV. made by Andrew Boorde*. His *Itinerary of Europe* and *Treatyse upon Berdes* are lost. Several jest-books are attributed to him without authority—*The Merie Tales of the Mad Men of Gotam* (earliest extant edition, 1630), *Scogin's Jests* (1626), *A mery jest of the Mylner of Abyngton, with his wyfe, and his daughter, and of two poore scholers of Cambridge* (printed by Wynkyn de Worde), and a Latin poem, *Nos Vagabunduli*.

See Dr F.J. Furnivall's reprint of the *Introduction* and some other selections for the Early English Text Society (new series, 1870).

BOOS, MARTIN (1762-1825), German Roman Catholic theologian, was born at Huttenried in Bavaria on the 25th of December 1762. Orphaned at the age of four, he was reared by an uncle at Augsburg, who finally sent him to the university of Dillingen. There he laid the foundation of the modest piety by which his whole life was distinguished. After serving as priest in several Bavarian towns, he made his way in 1799 to Linz in Austria, where he was welcomed by Bishop Gall, and set to work first at Leonding and then at Waldneukirchen, becoming in 1806 pastor at Gallneukirchen. His pietistic movement won considerable way among the Catholic laity, and even attracted some fifty or sixty priests. The death of Gall and other powerful friends, however, exposed him to bitter enmity and persecution from about 1812, and he had to answer endless accusations in the consistorial courts. His enemies followed him when he returned to Bavaria, but in 1817 the Prussian

government appointed him to a professorship at Düsseldorf, and in 1819 gave him the pastorate at Sayn near Neuwied. He died on the 29th of August 1825.

See *Life* by J. Gossner (1831).

BOOT, (1) (From the O. Eng. *bót*, a word common to Teutonic languages, *e.g.* Goth, *bóta*, "good, advantage," O.H.G. *Buoza*, Mod. Ger. *Busse*, "penance, fine"; cf. "better," the comparative of "good"), profit or advantage. The word survives in "bootless," *i.e.* useless or unavailing, and in such expressions, chiefly archaistic, as "what boots it?" "Bote," an old form, survives in some old compound legal words, such as "house-bote," "fire-bote," "hedge-bote," &c., for particular rights of "estover," the Norman French word corresponding to the Saxon "bote" (see Estovers and Commons). The same form survives also in such expressions as "thief-bote" for the Old English customary compensation paid for injuries.

(2) (A word of uncertain origin, which came into English through the O. Fr. *bote*, modern *botte*; Med. Lat. *botta* or *bota*), a covering for the foot. Properly a boot covers the whole lower part of the leg, sometimes reaching to or above the knee, but in common usage it is applied to one which reaches only above the ankle, and is thus distinguished from "shoe" (see Costume and Shoe).

The "boot" of a coach has the same derivation. It was originally applied to the fixed outside step, the French *botte*, then to the uncovered spaces on or beside the step on which the attendants sat facing sideways. Both senses are now obsolete, the term now being applied to the covered receptacles under the seats of the guard and coachman.

The Boot, Boots or Bootikin was an instrument of torture formerly in use to extort confessions from suspected persons, or obtain evidence from unwilling witnesses. It originated in Scotland, but the date of its first use is unknown. It was certainly frequently employed there in the latter years of the 16th century. In a case of forgery in 1579 two witnesses, a clergyman and an attorney, were so tortured. In a letter dated 1583 at the Record Office in London, Walsingham instructs the English ambassador at Edinburgh to have Father Holt, an English Jesuit, "put to the boots." It seems to have fallen into disuse after 1630, but was revived in 1666 on the occasion of the Covenanters' rebellion, and was employed during the reigns of Charles II. and James II. Upon the accession of William III. the Scottish convention denounced "the use of torture, without evidence and in ordinary crimes, as contrary to law." However, a year or so later, one Neville Payne, an Englishman suspected of treasonable motives for visiting Scotland, was put to the torture under the authority of a warrant signed by the king. This is the last recorded case of its use, torture being finally abolished in Scotland in 1709. It was not used in England after 1640. The boot was made of iron or wood and iron fastened on the leg, between which and the boot wedges were driven by blows from a mallet. After each blow a question was put to the victim, and the ordeal was continued until he gave the information or fainted. The wedges were usually placed against the calf of the leg, but Bishop Burnet says that they were sometimes put against the shin-bone. A similar instrument, called "Spanish boots," was used in Germany. There were also iron boots which were heated on the victim's foot. A less cruel form was a boot or buskin made wet and drawn upon the legs and then dried with fire.

BOÖTES (Gr. βοώτης, a ploughman, from βοῦς, an ox), a constellation of the northern hemisphere, mentioned by Eudoxus (4th century B.C.) and Aratus (3rd century B.C.), and perhaps alluded to in the book of Job (see Arcturus), and by Homer and Hesiod. The ancient Greeks symbolized it as a man walking, with his right hand grasping a club, and his left extending upwards and holding the leash of two dogs, which are apparently barking at the Great Bear. Ptolemy catalogues twenty-three stars, Tycho Brahe twenty-eight, Hevelius fifty-two. In addition to Arcturus, the brightest in the group, the most interesting stars of this constellation are: ε *Boötis*, a beautiful double star composed of a yellow star of magnitude 3, and a blue star of magnitude 6½; ξ *Boötis*, a double star composed of a yellow star, magnitude 4½, and a purple star, magnitude 6½; and *W. Boötis*, an irregularly variable star. This constellation has been known by many other names—Arcas, Arctophylax, Arcturus minor, Bubuleus, Bubulus, Canis latrans, Clamator, Icarus, Lycaon, Philometus, Plaustri custos, Plorans, Thegnis, Vociferator; the Arabs termed it Aramech or Archamech; Hesychius named it Orion; Jules Schiller, St Sylvester; Schickard, Nimrod; and Weigelius, the Three Swedish Crowns.

BOOTH, BARTON (1681-1733), English actor, who came of a good Lancashire family, was educated at Westminster school, where his success in the Latin play *Andria* gave him an inclination for the stage. He was intended for the church; but in 1698 he ran away from Trinity College, Cambridge, and obtained employment in a theatrical company in Dublin, where he made his first appearance as Oroonoko. After two seasons in Ireland he returned to London, where Betterton, who on an earlier application had withheld his active aid, probably out of regard for Booth's family, now gave him all the assistance in his power. At Lincoln's Inn Fields (1700-1704) he first appeared as Maximus in *Valentinian*, and his success was immediate. He was at the Haymarket with Betterton from 1705 to 1708, and for the next twenty years at Drury Lane. Booth died on the 10th of May 1733, and was buried in Westminster Abbey. His greatest parts, after the title-part of Addison's *Cato*, which established his reputation as a tragedian, were probably Hotspur and Brutus. His Lear was deemed worthy of

comparison with Garrick's. As the ghost in *Hamlet* he is said never to have had a superior. Among his other Shakespearian rôles were Mark Antony, Timon of Athens and Othello. He also played to perfection the gay Lothario in Rowe's *Fair Penitent*. Booth was twice married; his second wife, Hester Santlow, an actress of some merit, survived him.

See Cibber, *Lives and Characters of the most eminent Actors and Actresses* (1753); Victor, *Memoirs of the Life of Barton Booth* (1733).

BOOTH, CHARLES (1840-), English sociologist, was born at Liverpool on the 30th of March 1840. In 1862 he became a partner in Alfred Booth & Company, a Liverpool firm engaged in the Brazil trade, and subsequently chairman of the Booth Steamship Company. He devoted much time, and no inconsiderable sums of money, to inquiries into the statistical aspects of social questions. The results of these are chiefly embodied in a work entitled *Life and Labour of the People in London* (1891-1903), of which the earlier portion appeared under the title of *Life and Labour* in 1889. The book is designed to show "the numerical relation which poverty, misery and depravity bear to regular earnings and comparative comfort, and to describe the general conditions under which each class lives." It contains a most striking series of maps, in which the varying degrees of poverty are represented street by street, by shades of colour. The data for the work were derived in part from the detailed records kept by school-board "visitors," partly from systematic inquiries directed by Mr Booth himself, supplemented by information derived from relieving officers and the Charity Organization Society. Mr Booth also paid much attention to a kindred subject—the lot of the aged poor. In 1894 he published a volume of statistics on the subject, and, in 1891 and 1899, works on Old-age pensions, his scheme for the latter depending on a general provision of pensions of five shillings a week to all aged persons, irrespective of the cost to the state. He married, in 1871, the daughter of Charles Zachary Macaulay. In 1904 he was made a privy councillor.

BOOTH, EDWIN [THOMAS] (1833-1893), American actor, was the second son of the actor Junius Brutus Booth, and was born in Belair, Maryland, on the 13th of November 1833. His father (1796-1852) was born in London on the 1st of May 1796, and, after trying printing, law, painting and the sea, made his first appearance on the stage in 1813, and appeared in London at Covent Garden in 1815. He became almost at once a great favourite, and a rival of Kean, whom he was thought to resemble. To Kean's Othello nevertheless he played Iago on several occasions. Richard III., Hamlet, King Lear, Shylock and Sir Giles Overreach were his best parts, and in America, whither he removed in 1821, they brought him great popularity. His eccentricities sometimes bordered on insanity, and his excited and furious fencing as Richard III. and as Hamlet frequently compelled the Richmond and Laertes to fight for their lives in deadly earnest.

Edwin Booth's first regular appearance was at the Boston Museum on the 10th of September 1849, as Tressel to his father's Richard, in Colley Cibber's version of *Richard III.* He was lithe and graceful in figure, buoyant in spirits; his dark hair fell in waving curls across his brow, and his eyes were soft, luminous and most expressive. His father watched him with great interest, but with evident disappointment, and the members of the theatrical profession, who held the acting of the elder Booth in great reverence, seemed to agree that the genius of the father had not descended to the son. Edwin Booth's first appearance in New York was in the character of Wilford in *The Iron Chest*, which he played at the National theatre in Chatham Street, on the 27th of September 1850. A year later, on the illness of the father, the son took his place in the character of Richard III. It was not until after his parent's death that the son conquered for himself an unassailable position on the stage. Between 1852 and 1856 he played in California, Australia and the Sandwich Islands, and those who had known him in the east were surprised when the news came that he had captivated his audiences with his brilliant acting. From this time forward his dramatic triumphs were warmly acknowledged. His Hamlet, Richard and Richelieu were pronounced to be superior to the performances of Edwin Forrest; his success as Sir Giles Overreach in *A New Way to Pay Old Debts* surpassed his father's. In 1862 he became manager of the Winter Garden theatre, New York, where he gave a series of Shakespearian productions of then unexampled magnificence (1864-1867), including *Hamlet*, *Othello* and *The Merchant of Venice*. The splendour of this period in his career was dashed for many months when in 1865 his brother, John Wilkes Booth, assassinated President Lincoln (see Lincoln, Abraham). The three Booth brothers, Junius Brutus (1821-1853), Edwin and John Wilkes (1839-1865), had played together in *Julius Caesar* in the autumn of the previous year—the performance being memorable both for its own excellence, and for the tragic situation into which two of the principal performers were subsequently hurled by the crime of the third. Edwin Booth did not reappear on the stage until the 3rd of January 1866, when he played Hamlet at the Winter Garden theatre, the audience showing by unstinted applause their conviction that the glory of the one brother would never be imperilled by the infamy of the other.

In 1868-1869 Edwin Booth built a theatre of his own—Booth's theatre, at the corner of 23rd Street and 6th Avenue, New York—and organized an excellent stock company, which produced *Romeo and Juliet*, *The Winter's Tale*, *Julius Caesar*, *Macbeth*, *Much Ado about Nothing*, *The Merchant of Venice* and other plays. In all cases Booth used the true text of Shakespeare, thus antedating by many years a similar reform in England. Almost invariably his ventures were successful, but he was of a generous and confiding nature, and his management was not economical. In 1874 the grand dramatic structure he had raised was taken from him, and with it went his entire fortune. By arduous toil, however, he again accumulated wealth, in the use of which his generous nature was shown. He converted his spacious residence in Gramercy Park, New York, into a club—The Players'—for the elect of his profession, and for such members of other professions as they might choose. The house, with all his books and works of art, and many invaluable mementos of the stage, became the property of the club. A single apartment he kept for himself. In this he died on the 7th of June 1893. Among his parts were

Macbeth, Lear, Othello, Iago, Shylock, Wolsey, Richard II., Richard III., Benedick, Petruccio, Richelieu, Sir Giles Overreach, Brutus (Payne's), Bertuccio (in Tom Taylor's *The Fool's Revenge*), Ruy Blas, Don Cesar de Bazan, and many more. His most famous part was Hamlet, for which his extraordinary grace and beauty and his eloquent sensibility peculiarly fitted him. He probably played the part oftener than any other actor before or since. He visited London in 1851, and again in 1880 and in 1882, playing at the Haymarket theatre with brilliant success. In the last year he also visited Germany, where his acting was received with the highest enthusiasm. His last appearance was in Brooklyn as Hamlet in 1891. Booth was twice married: in 1860 to Mary Devlin (d. 1863), and in 1869 to Mary F. McVicker (d. 1881). He left by his first wife one daughter, Edwina Booth Grossman, who published *Edwin Booth: Recollections* (New York, 1894).

Edwin Booth's prompt-books were edited by William Winter (1878). In a series of volumes, *Actors and Actresses of Great Britain and America*, edited by Lawrence Hutton and Brander Matthews, Edwin Booth contributed recollections of his father, which contain much valuable autobiographic material. For the same series Lawrence Barrett contributed an article on Edwin Booth. See also William Winter, *Life and Art of Edwin Booth* (1893); Lawrence Hutton, *Edwin Booth* (1893); Henry A. Clapp, *Reminiscences of a Dramatic Critic* (Boston, 1902); A.B. Clarke. *The Elder and the Younger Booth* (Boston, 1882).

(J. J.*)

BOOTH, WILLIAM (1829-), founder and "general" of the Salvation Army (*q.v.*), was born at Nottingham on the 10th of April 1829. At the age of fifteen his mind took a strongly religious turn, under the influence of the Wesleyan Methodists, in which body he became a local preacher. In 1849 he came to London, where, according to his own account, his passion for open-air preaching caused his severance from the Wesleyans. Joining the Methodist New Connexion, he was ordained a minister, but, not being employed as he wished in active "travelling evangelization," left that body also in 1861. Meanwhile he had (1855) married Miss Catherine Mumford, and had a family of four children. Both he and his wife occupied themselves with preaching, first in Cornwall and then in Cardiff and Walsall. At the last-named place was first organized a "Hallelujah band" of converted criminals and others, who testified in public of their conversion. In 1864 Booth went to London and continued his services in tents and in the open air, and founded a body which was successively known as the East London Revival Society, the East London Christian Mission, the Christian Mission and (in 1878) the Salvation Army. The Army operates (1) by outdoor meetings and processions; (2) by visiting public-houses, prisons, private houses; (3) by holding meetings in theatres, factories and other unusual buildings; (4) by using the most popular song-tunes and the language of everyday life, &c.; (5) by making every convert a daily witness for Christ, both in public and private. The army is a quasi-military organization, and Booth modelled its "Orders and Regulations" on those of the British army. Its early "campaigns" excited violent opposition, a "Skeleton Army" being organized to break up the meetings, and for many years Booth's followers were subjected to fine and imprisonment as breakers of the peace. Since 1889, however, these disorders have been little heard of. The operations of the army were extended in 1880 to the United States, in 1881 to Australia, and spread to the European continent, to India, Ceylon and elsewhere, "General" Booth himself being an indefatigable traveller, organizer and speaker. His wife (b. 1829) died in 1890. By her preaching at Gateshead, where her husband was circuit minister, in 1860, she began the women's ministry which is so prominent a feature of the army's work. A biography of her by Mr Booth Tucker appeared in 1892.

In 1890 "General" Booth attracted further public attention by the publication of a work entitled *In Darkest England, and the Way Out*, in which he proposed to remedy pauperism and vice by a series of ten expedients: (1) the city colony; (2) the farm colony; (3) the over-sea colony; (4) the household salvage brigade; (5) the rescue homes for fallen women; (6) deliverance for the drunkard; (7) the prison-gate brigade; (8) the poor man's bank; (9) the poor man's lawyer; (10) Whitechapel-by-the-Sea. Money was liberally subscribed and a large part of the scheme was carried out. The opposition and ridicule with which Booth's work was for many years received gave way, towards the end of the 19th century, to very widespread sympathy as his genius and its results were more fully realized. 240

The active encouragement of King Edward VII., at whose instance in 1902 he was invited officially to be present at the coronation ceremony, marked the completeness of the change; and when, in 1905, the "general" went on a progress through England, he was received in state by the mayors and corporations of many towns. In the United States also, and elsewhere, his work was cordially encouraged by the authorities.

See T.F. Coates, *The Life Story of General Booth* (2nd ed., London, 1906), and bibliography under SALVATION ARMY.

BOOTH (connected with a Teutonic root meaning to dwell, whence also "bower"), primarily a temporary dwelling of boughs or other slight materials. Later the word gained the special meaning of a market stall or any non-permanent erection, such as a tent at a fair, where goods were on sale. Later still it was applied to the temporary structure where votes were registered, viz. polling-booth. Temporary booths erected for the weekly markets naturally tended to become permanent shops. Thus Stow states that the houses in Old Fish Street, London, "were at first but movable boards set out on market days to show their fish there to be sold; but procuring licence to set up sheds, they grew to shops, and by little and little, to tall houses." As *bothy* or *bothie*, in Scotland, meaning generally a hut or cottage, the word was specially applied to a barrack-like room on large farms where the unmarried labourers were lodged. This, known as the *Bothy system*, was formerly common in Aberdeenshire and other parts of northern Scotland.

BOOTHIA (*Boothia Felix*), a peninsula of British North America, belonging to Franklin district, and having an area of 13,100 sq. m., between 69° 30′ and 71° 50′ N. and 91° 30′ and 97° W. Its northernmost promontory, Murchison Point, is also the northernmost point of the American mainland. It was discovered by Captain (afterwards Sir James) Ross, during his expedition of 1829-1833, and was named after Sir Felix Booth, who had been chiefly instrumental in fitting out the expedition. Boothia forms the western side of Boothia Gulf. From the main mass of the continent the peninsula is almost separated by lakes and inlets; and a narrow channel known as Bellot Strait intervenes between it and North Somerset Island, which was discovered by Sir E. Parry in 1819. The peninsula is not only interesting for its connexion with the Franklin expedition and the Franklin search, but is of scientific importance from the north magnetic pole having been first distinctly localized here by Ross, on the western side, in 70° 5′ N., 96° 47′ W.

Boothia Gulf separates the north-western portion of Baffin Land and Melville Peninsula from Boothia Peninsula. It is connected with Barrow Strait and Lancaster Sound by Prince Regent Inlet, with Franklin Strait by Bellot Strait, and with Fox Channel by Fury and Hecla Strait. The principal bays are Committee and Pelly in the southern portion, and Lord Mayor in the western.

BOOTLE, a municipal and county borough in the Bootle parliamentary division of Lancashire, England; at the mouth of the Mersey, forming a northern suburb of Liverpool. Pop. (1901) 58,566; an increase by nearly nine times in forty years. The great docks on this, the east bank of the Mersey, extend into the borough, but are considered as a whole under Liverpool (*q.v.*). Such features, moreover, as communications, water-supply, &c., may be considered as part of the greater systems of the same city. The chief buildings and institutions are a handsome town hall, a museum, free libraries, technical schools, and several public pleasure grounds. Bootle was incorporated in 1868 and was created a county borough in 1888; the corporation consists of a mayor, 10 aldermen and 30 councillors. A proposal to include it within the city of Liverpool was rejected in parliament in July 1903. Area, 1576 acres.

BOOTY (apparently influenced by “boot,” 0. Eng. *bot*, advantage or profit, through an adaptation from an earlier form cognate with Ger. *Beute* and Fr. *butin*), plunder or gain. The phrase “to play booty,” dating from the 16th century, means to play into a confederate’s hands, or to play intentionally badly at first in order to deceive an opponent.

BOPP, FRANZ (1791-1867), German philologist, was born at Mainz on the 14th of September 1791. In consequence of the political troubles of that time, his parents removed to Aschaffenburg, in Bavaria, where he received a liberal education at the Lyceum. It was here that his attention was drawn to the languages and literature of the East by the eloquent lectures of Karl J. Windischmann, who, with G.F. Creuzer, J.J. Görres, and the brothers Schlegel, was full of enthusiasm for Indian wisdom and philosophy. And further, Fr. Schlegel’s book, *Über die Sprache und Weisheit der Indier* (Heidelberg, 1808), which was just then exerting a powerful influence on the minds of German philosophers and historians, could not fail to stimulate also Bopp’s interest in the sacred language of the Hindus. In 1812 he went to Paris at the expense of the Bavarian government, with a view to devote himself vigorously to the study of Sanskrit. There he enjoyed the society of such eminent men as A.L. Chézy, S. de Sacy, L.M. Langlès, and, above all, of Alexander Hamilton (1762-1824), who had acquired, when in India, an acquaintance with Sanskrit, and had brought out, conjointly with Langlès, a descriptive catalogue of the Sanskrit manuscripts of the Imperial library. At that library Bopp had access not only to the rich collection of Sanskrit manuscripts, most of which had been brought from India by Father Pons early in the 18th century, but also to the Sanskrit books which had up to that time issued from the Calcutta and Serampore presses. The first fruit of his four years’ study in Paris appeared at Frankfort-On-Main in 1816, under the title *Über das Conjugationssystem der Sanskritsprache in Vergleichung mit jenem der griechischen, lateinischen, persischen und germanischen Sprache*, and it was accompanied with a preface from the pen of Windischmann. In this first book Bopp entered at once on the path on which the philological researches of his whole subsequent life were concentrated. It was not that he wished to prove the common parentage of Sanskrit with Persian, Greek, Latin and German, for that had long been established; but his object was to trace the common origin of their grammatical forms, of their inflections from composition,—a task which had never been attempted. By a historical analysis of those forms, as applied to the verb, he furnished the first trustworthy materials for a history of the languages compared.

After a brief sojourn in Germany, Bopp came to London, where he made the acquaintance of Sir Charles Wilkins and H.T. Colebrooke, and became the friend of Wilhelm von Humboldt, then Prussian ambassador at the court of St James’s, to whom he gave instruction in Sanskrit. He brought out, in the *Annals of Oriental Literature* (London, 1820), an essay entitled, “Analytical Comparison of the Sanskrit, Greek, Latin and Teutonic

Languages," in which he extended to all parts of the grammar what he had done in his first book for the verb alone. He had previously published a critical edition, with a Latin translation and notes, of the story of *Nala and Damayantī* (London, 1819), the most beautiful episode of the Mahābhārata. Other episodes of the Mahābhārata —*Indralokāgamanam*, and three others (Berlin, 1824); *Diluvium*, and three others (Berlin, 1829); and a new edition of *Nala* (Berlin, 1832)—followed in due course, all of which, with A.W. Schlegel's edition of the *Bhagavadgītā* (1823), proved excellent aids in initiating the early student into the reading of Sanskrit texts. On the publication, in Calcutta, of the whole Mahābhārata, Bopp discontinued editing Sanskrit texts, and confined himself thenceforth exclusively to grammatical investigations.

After a short residence at Göttingen, Bopp was, on the recommendation of Humboldt, appointed to the chair of Sanskrit and comparative grammar at Berlin in 1821, and was elected member of the Royal Prussian Academy in the following year. He brought out, in 1827, his *Ausführliches Lehrgebäude der Sanskrita-Sprache*, on which he had been engaged since 1821. A new edition, in Latin, was commenced in the following year, and completed in 1832; and a shorter grammar appeared in 1834. At the same time he compiled a Sanskrit and Latin glossary (1830) in which, more especially in the second and third editions (1847 and 1867), account was also taken of the cognate languages. His chief activity, however, centred on the elaboration of his *Comparative Grammar*, which appeared in six parts at considerable intervals (Berlin, 1833, 1835, 1842, 1847, 1849, 1852), under the title *Vergleichende Grammatik des Sanskrit, Zend, Griechischen, Lateinischen, Litthauischen, Altslavischen, Gothischen, und Deutschen*. How carefully this work was matured may be gathered from the series of monographs printed in the *Transactions of the Berlin Academy* (1824 to 1831), by which it was preceded. They bear the general title, *Vergleichende Zergliederung des Sanskrits und der mit ihm verwandten Sprachen*. Two other essays (on the "Numerals," 1835) followed the publication of the first part of the *Comparative Grammar*. The Old-Slavonian began to take its stand among the languages compared from the second part onwards. The work was translated into English by E.B. Eastwick in 1845. A second German edition, thoroughly revised (1856-1861), comprised also the Old-Armenian. From this edition an excellent French translation was made by Professor Michel Bréal in 1866. The task which Bopp endeavoured to carry out in his *Comparative Grammar* was threefold,—to give a description of the original grammatical structure of the languages as deduced from their intercomparison, to trace their phonetic laws, and to investigate the origin of their grammatical forms. The first and second points were subservient to the third. As Bopp's researches were based on the best available sources, and incorporated every new item of information that came to light, so they continued to widen and deepen in their progress. Witness his monographs on the vowel system in the Teutonic languages (1836), on the Celtic languages (1839), on the Old-Prussian (1853) and Albanian languages (1854), on the accent in Sanskrit and Greek (1854), on the relationship of the Malayo-Polynesian with the Indo-European languages (1840), and on the Caucasian languages (1846). In the two last mentioned the impetus of his genius led him on a wrong track. Bopp has been charged with neglecting the study of the native Sanskrit grammars, but in those early days of Sanskrit studies the requisite materials were not accessible in the great libraries of Europe; and if they had been, they would have absorbed his exclusive attention for years, while such grammars as those of Wilkins and Colebrooke, from which his grammatical knowledge was derived, were all based on native grammars. The further charge that Bopp, in his *Comparative Grammar*, gave undue prominence to Sanskrit may be disproved by his own words; for, as early as the year 1820, he gave it as his opinion that frequently the cognate languages serve to elucidate grammatical forms lost in Sanskrit (*Annals of Or. Lit.* i. 3),—an opinion which he further developed in all his subsequent writings.

Bopp's researches, carried with wonderful penetration into the most minute and almost microscopical details of linguistic phenomena, have led to the opening up of a wide and distant view into the original seats, the closer or more distant affinity, and the tenets, practices and domestic usages of the ancient Indo-European nations, and the science of comparative grammar may truly be said to date from his earliest publication. In grateful recognition of that fact, on the fiftieth anniversary (May 16, 1866) of the date of Windischmann's preface to that work, a fund called *Die Bopp-Stiftung*, for the promotion of the study of Sanskrit and comparative grammar, was established at Berlin, to which liberal contributions were made by his numerous pupils and admirers in all parts of the globe. Bopp lived to see the results of his labours everywhere accepted, and his name justly celebrated. But he died, on the 23rd of October 1867, a poor man,—though his genuine kindliness and unselfishness, his devotion to his family and friends, and his rare modesty, endeared him to all who knew him.

See M. Bréal's translation of Bopp's *Vergl. Gramm.* (1866) introduction; Th. Benfey, *Gesch. der Sprachwissenschaft* (1869); A. Kuhn in *Unsere Zeit,* Neue Folge, iv. i (1868); Lefmann, *Franz Bopp* (Berlin, 1891-1897).

BOPPARD, a town of Germany, in the Prussian Rhine province, on the left bank of the Rhine, 12 m. S. of Coblenz on the mainline to Cologne. Pop. (1900) 5806. It is an old town still partly surrounded by medieval walls, and its most noteworthy buildings are the Roman Catholic parish church (12th and 13th centuries); the Carmelite church (1318), the former castle, now used for administrative offices; the Evangelical church (1851, enlarged in 1887); and the former Benedictine motnastery of the Marienberg, founded 1123 and since 1839 a hydropathic establishment, crowning a hill 100 ft. above the Rhine. Boppard is a favourite tourist centre, and being less pent in by hills than many other places in this part of the picturesque gorge of the Rhine, has in modern times become a residential town. It has some comparatively insignificant industries, such as tanning and tobacco manufacture; its direct trade is in wine and fruit.

Boppard (*Baudobriga*) was founded by the Romans; under the Merovingian dynasty it became a royal residence. During the middle ages it was a considerable centre of commerce and shipping, and under the Hohenstaufen emperors was raised to the rank of a free imperial city. In 1312, however, the emperor Henry VII. pledged the town to his brother Baldwin, archbishop-elector of Trier, and it remained in the possession of the electors until it was absorbed by France during the Revolutionary epoch. It was assigned by the congress of Vienna in 1815 to Prussia.

BORA, an Italian name for a violent cold northerly and northeasterly wind, common in the Adriatic, especially on the Istrian and Dalmatian coasts. There is always a northern tendency in the winds on the north Mediterranean shores in winter owing to the cold air of the mountains sliding down to the sea where the pressure is less. When, therefore, a cyclone is formed over the Mediterranean, the currents in its north-western area draw the air from the cold northern regions, and during the passage of the cyclone the bora prevails. The bora also occurs at Novorossiysk on the Black Sea. It is precisely similar in character to the mistral which prevails in Provence and along the French Mediterranean littoral.

BORACITE, a mineral of special interest on account of its optical anomalies. Small crystals bounded on all sides by sharply defined faces are found in considerable numbers embedded in gypsum and anhydrite in the salt deposits at Lüneburg in Hanover, where it was first observed in 1787. In external form these crystals are cubic with inclined hemihedrism, the symmetry being the same as in blende and tetrahedrite. Their habit varies according to whether the tetrahedron (fig. 1), the cube (fig. 2). or the rhombic dodecahedron (fig. 3) predominates. Penetration twins with a tetrahedron face as twin-plane are sometimes observed. The crystals vary from translucent to transparent, are possessed of a vitreous lustre, and are colourless or white, though often tinged with grey, yellow or green. The hardness is as high as 7 on Mohs' scale; specific gravity 3.0. As first observed by R.J. Haüy in 1791, the crystals are markedly pyroelectric; a cube when heated becomes positively electrified on four of its corners and negatively on the four opposite corners. In a crystal such as represented in fig. 3, the smaller and dull tetrahedral faces *s* are situated at the analogous poles (which become positively electrified when the crystal is heated), and the larger and bright tetrahedral faces *s'* at the antilogous poles.

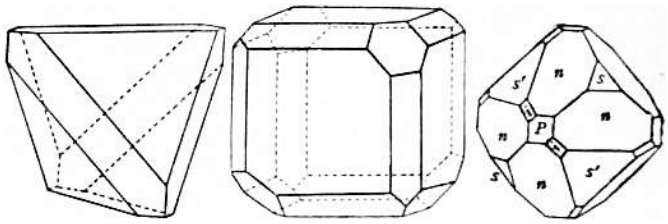


FIG. 1. FIG. 2. FIG. 3.

Crystals of Boracite.

The characters so far enumerated are strictly in accordance with cubic symmetry, but when a crystal is examined in polarized light, it will be seen to be doubly refracting, as was first observed by Sir David Brewster in 1821. Thin sections show twin-lamellae, and a division into definite areas which are optically biaxial. By cutting sections in suitable directions, it may be proved that a rhombic dodecahedral crystal is really built up of twelve orthorhombic pyramids, the apices of which meet in the centre and the bases coincide with the dodecahedral faces of the compound (pseudo-cubic) crystal. Crystals of other forms show other types of internal structure. When the crystals are heated these optical characters change, and at a temperature of 265° the crystals suddenly become optically isotropic; on cooling, however, the complexity of internal structure reappears. Various explanations have been offered to account for these "optical anomalies" of boracite. Some observers have attributed them to alteration, others to internal strains in the crystals, which originally grew as truly cubic at a temperature above 265°. It would, however, appear that there are really two crystalline modifications of the boracite substance, a cubic modification stable above 265° and an orthorhombic (or monoclinic) one stable at a lower temperature. This is strictly analogous to the case of silver iodide, of which cubic and rhombohedral modifications exist at different temperatures; but whereas rhombohedral as well as pseudo-cubic crystals of silver iodide (iodyrite) are known in nature, only pseudo-cubic crystals of boracite have as yet been met with.

Chemically, boracite is a magnesium borate and chloride with the formula $Mg_7Cl_2B_{16}O_{30}$—A small amount of iron is sometimes present, and an iron-boracite with half the magnesium replaced by ferrous iron has been called huyssenite. The mineral is insoluble in water, but soluble in hydrochloric acid. On exposure it is liable to slow alteration, owing to the absorption of water by the magnesium chloride: an altered form is known as parasite.

In addition to embedded crystals, a massive variety, known as stassfurtite, occurs as nodules in the salt deposits at Stassfurt in Prussia: that from the carnallite layer is compact, resembling fine-grained marble, and white or greenish in colour, whilst that from the kainite layer is soft and earthy, and yellowish or reddish in colour.

(L. J. S.)

BORAGE (pronounced like "courage"; possibly from Lat. *borra*, rough hair), a herb (*Borago officinalis*) with

bright blue flowers and hairy leaves and stem, considered to have some virtue as a cordial and a febrifuge; used as an ingredient in salads or in making claret-cup, &c.

BORAGINACEAE, an order of plants belonging to the sympetalous section of dicotyledons, and a member of the series Tubiflorae. It is represented in Britain by bugloss (*Echium*) (fig. 1), comfrey (*Symphytum*), *Myosotis*, hounds-tongue (*Cynoglossum*) (fig. 2), and other genera, while borage (*Borago officinalis*) (fig. 3) occurs as a garden escape in waste ground. The plants are rough-haired annual or perennial herbs, more rarely shrubby or arborescent, as in *Cordia* and *Ehretia*, which are tropical or sub-tropical. The leaves, which are generally alternate, are usually entire and narrow: the radical leaves in some genera, as *Pulmonaria* (lungwort) and *Cynoglossum*, differ in form from the stem-leaves, being generally broader and sometimes heart-shaped. A characteristic feature is the one-sided (*dorsiventral*) inflorescence, well illustrated in forget-me-not and other species of *Myosotis*; the cyme is at first closely coiled, becoming uncoiled as the flowers open. At the same time there is often a change in colour in the flowers, which are red in bud, becoming blue as they expand, as in *Myosotis, Echium, Symphytum* and others. The flowers are generally regular; the form of the corolla varies widely. Thus in borage it is rotate, tubular in comfrey, funnel-shaped in hounds-tongue, and salver-shaped in alkanet (*Anchusa*); the throat is often closed by scale-like outgrowths from the corolla, forming the so-called corona. A departure from the usual regular corolla occurs in *Echium* and a few allied genera, where it is oblique; in *Lycopsis* it is also bent.

FIG. 1.—Viper's Bugloss (*Echium vulgare*), about ¼ nat. size.

1. Single flower, about nat. size.
2. Corolla split open.
3. Calyx.
4. Pistil.
5. One stamen.
6. Calyx surrounding nutlets.
7. Same part of calyx cut away.
8. Two nutlets.
9. Same enlarged.

The five stamens alternate in position with the lobes of the corolla. The ovary, of two carpels, is seated on a ring-like disk which secretes honey. Each carpel becomes divided by a median constriction in four portions, each containing one ovule; the style springs from the centre of the group of four divisions.

The flowers show well-marked adaptation to insect-visits. Their colour and tendency to arrangement on one surface, with the presence of honey, serve to attract insects. The scales around the throat of the corolla protect the pollen and honey from wet or undesirable visitors, and by their difference in colour from the corolla-lobes, as in the yellow eye of forget-me-not, may serve to indicate the position of the honey. In most genera the fruit consists of one-seeded nutlets, generally four, but one or more may be undeveloped. The shape of the nutlet and the character of its coat are very varied. Thus in *Lithospermum* the nutlets are hard like a stone, in *Myosotis* usually polished, in *Cynoglossum* covered with bristles, &c.

The order is widely spread in temperate and tropical regions, and contains 85 genera with about 1200 species. Its chief centre is the Mediterranean region, whence it extends over central Europe and Asia, becoming less frequent northwards. A smaller centre occurs on the Pacific side of North America. The order is less developed in the south temperate zone.

The order is of little economic value. Several genera, such as borage and *Pulmonaria*, were formerly used in medicine, and the roots yield purple or brown dyes, as in *Alkanna tinctoria* (alkanet). Heliotrope or cherry-pie (*Heliotropium peruvianum*) is a well-known garden plant.

Fig. 2.—(1) Inflorescence of Forget-me-not; (2) ripe fruits.

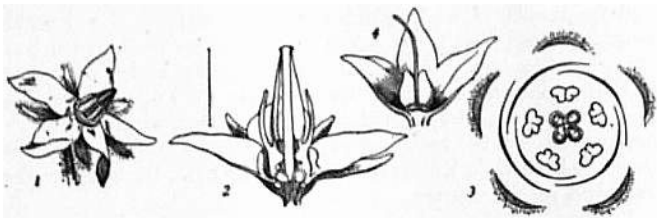


Fig. 3.—(1) Flower of Borage; (2) same in vertical section enlarged; (3) horizontal plan of flower; (4) flower of Comfrey after removal of corolla, showing unripe fruit.

BORÅS, a town of Sweden, in the district (*län*) of Elfsborg, 45 m. E. of Gothenburg by rail, on the river Viske. Pop. (1880) 4723; (1900) 15,837. It ranks among the first twelve towns in Sweden both in population and in the value of its manufacturing industries. These are principally textile, as there are numerous cotton spinning and weaving mills, together with a technical weaving school. The town was founded in 1632 by King Gustavus Adolphus.

BORAX (sodium pyroborate or sodium biborate), $Na_2B_4O_7$, a substance which appears in commerce under two forms, namely “common” or prismatic borax, $Na_2B_4O_7{\cdot}10H_2O$, and “jewellers’” or octahedral borax, $Na_2B_4O_7{\cdot}5H_2O$. It is to be noted that the term “borax” was used by the alchemists in a very vague manner, and is therefore not to be taken as meaning the substance now specifically known by the name. Prismatic borax is found widely distributed as a natural product (see below, *Mineralogy*) in Tibet, and in Canada, Peru and Transylvania, while the bed of Borax Lake, near Clear Lake in California, is occupied by a large mass of crystallized borax, which is fit for use by the assayer without undergoing any preliminary purification. The supply of borax is, however, mainly derived from the boric acid of Tuscany, which is fused in a reverberatory furnace with half its weight of sodium carbonate, and the mass after cooling is extracted with warm water. An alternative method is to dissolve sodium carbonate in lead-lined steam-heated pans, and add the boric acid gradually; the solution then being concentrated until the borax crystallizes. Borax is also prepared from the naturally occurring calcium borate, which is mixed in a finely divided condition with the requisite quantity of soda ash; the mixture is fused, extracted with water and concentrated until the solution commences to crystallize.

From a supersaturated aqueous solution of borax, the pentahydrate, $Na_2B_4O_7{\cdot}5H_2O$, is deposited when evaporation takes place at somewhat high temperatures. The same hydrate can be prepared by dissolving borax in water until the solution has a specific gravity of 1.246 and then allowing the solution to cool. The pentahydrate is deposited between 79° C. and 56° C.; below this temperature the decahydrate or ordinary borax, $Na_2B_4O_7{\cdot}10H_2O$, is deposited. Crystals of ordinary borax swell up to a very great extent on heating, losing their water of crystallization and melting to a clear white glass. The crystals of octahedral borax fuse more easily than those of the prismatic form and are less liable to split when heated, so that they are preferable for soldering or fluxing. Fused borax dissolves many metallic oxides, forming complex borates which in many cases show characteristic colours. Its use in soldering depends on the fact that solder only adheres to the surface of an untarnished metal, and consequently a little borax is placed on the surface of the metal and heated by the soldering iron in order to remove any superficial film of oxide. It is also used for glazing pottery, in glass-making and the glazing of linen.

Boric acid (*q.v.*) being only a weak acid, its salts readily undergo hydrolytic dissociation in aqueous solution, and this property can be readily shown with a concentrated aqueous solution of borax, for by adding litmus and then just sufficient acetic acid to turn the litmus red, the addition of a large volume of water to the solution changes the colour back to blue again. The boric acid being scarcely ionized gives only a very small quantity of hydrogen ions, whilst the base (sodium hydroxide) produced by the hydrolysis occasioned by the dilution of the

solution, being a “strong base,” is highly ionized and gives a comparatively large amount of hydroxyl ions. In the solution, therefore, there is now an excess of hydroxyl ions; consequently it has an alkaline reaction and the litmus turns blue.

Mineralogy.—The Tibetan mineral deposits have been known since very early times, and formerly the crude material was exported to Europe, under the name of *tincal*, for the preparation of pure borax and other boron salts. The most westerly of the Tibetan deposits are in the lake-plain of Pugha on the Rulangchu, a tributary of the Indus, at an elevation of 15,000 ft.: here the impure borax (*sohaga*) occurs over an area of about 2 sq. m., and is covered by a saline efflorescence; successive crops are obtained by the action of rain and snow and subsequent evaporation. Deposits of purer material (*chú tsalé* or water borax) occur at the lakes of Rudok, situated to the east of the Pugha district; also still farther to the east at the great lakes Tengri Nor, north of Lhasa, and several other places. More recently, the extensive deposits of borates (chiefly, however, of calcium; see Colemanite) in the Mohave desert on the borders of California and Nevada, and in the Atacama desert in South America, have been the chief commercial sources of boron compounds. The boron contained in solution in the salt lakes has very probably been supplied by hot springs and solfataras of volcanic origin, such as those which at the present day charge the waters of the lagoons in Tuscany with boric acid. The deposits formed by evaporation from these lakes and marshes or salines, are mixtures of borates, various alkaline salts (sodium carbonate, sulphate, chloride), gypsum, &c. In the mud of the lakes and in the surrounding marshy soil fine isolated crystals of borax are frequently found. For example, crystals up to 7 in. in length and weighing a pound each have been found in large numbers at Borax Lake in Lake county, and at Borax Lake in San Bernardino county, both in California.

Borax crystallizes with ten molecules of water, the composition of the crystals being $Na_2B_4O_7 + 10H_2O$. The crystals belong to the monoclinic system, and it is a curious fact that in habit and angles they closely resemble pyroxene (a silicate of calcium, magnesium and iron). There is a perfect cleavage parallel to the orthopinacoid and less perfect cleavages parallel to the faces of the prism. The mineral is transparent to opaque and white, sometimes greyish, bluish or greenish in colour. Hardness 2-2½; sp. gr. 1.69-1.72.

The optical characters are interesting, because of the striking crossed dispersion of the optic axes, of which phenomenon borax affords the best example. The optic figure seen in convergent polarized light through a section cut parallel to the plane of symmetry of a borax crystal is symmetrical only with respect to the central point. The plane of the optic axes for red light is inclined at 2° to that for blue light, and the angle between the optic axes themselves is 3° greater for red than for blue light.

BORDA, JEAN CHARLES (1733-1799), French mathematician and nautical astronomer, was born at Dax on the 4th of May 1733. He studied at La Flèche, and at an early age obtained a commission in the cavalry. In 1756 he presented a *Mémoire sur le mouvement des projectiles* to the Academy of Sciences, who elected him a member. He was present at the battle of Hastembeck, and soon afterwards joined the naval service. He visited the Azores and the Canary Islands, of which he constructed an admirable map. In 1782 his frigate was taken by a British squadron; he himself was carried to England, but was almost immediately released on parole and returned to France. He died at Paris on the 20th of February 1799. Borda contributed a long series of valuable memoirs to the Academy of Sciences. His researches in hydrodynamics were highly useful for marine engineering, while the reflecting and repeating circles, as improved by him, were of great service in nautical astronomy. He was associated with J.B.J. Delambre and P.F.A. Méchain in the attempt to determine an arc of the meridian, and the greater number of the instruments employed in the task were invented by him.

See J.B. Biot, “Notice sur Borda” in the *Mém. de l’Acad. des Sciences*, iv.

BORDAGE. (i) A nautical term (from Fr. *bord*, side) for the planking on a ship’s side. (2) A feudal term (from Lat. *borda*, a cottage) for the tenure by which a certain class of villein held their cottages; also the services due from these villeins or “bordars.” A “bordar” (Med. Lat. *bardarius*) was a villein who obtained a cottage from his lord in return for menial services (see Villenage).

BORDEAUX, a city of south-western France, capital of the department of Gironde, 359 m. S.S.W. of Paris by a main line of the Orléans railway and 159 m. N.W. of Toulouse on the main line of the Southern railway. Pop. (1906) 237,707. Bordeaux, one of the finest and most extensive cities in France, is situated on the left or west bank of the Garonne about 60 m. from the sea, in a plain which comprises the wine-growing district of Médoc. The Garonne at this point describes a semicircle, separating the city proper on the left bank from the important suburb of La Bastide on the right bank. The river is crossed by the Pont de Bordeaux, a fine stone structure of the early 19th century, measuring 1534 ft. in length, and by a railway bridge connecting the station of the Orléans railway company in La Bastide with that of the Southern company on the left bank. Looking west from the Pont de Bordeaux, the view embraces a crescent of wide and busy quays with a background of lofty warehouses, factories and mansions, behind which rise towers and steeples. Almost at the centre of the line of quays is the Place des Quinconces, round which lie the narrow, winding streets in which the life of the city is concentrated. Outside this quarter, which contains most of the important buildings, the streets are narrow and

quiet and bordered by the low white houses which at Bordeaux take the place of the high tenements characteristic of other large French towns. The whole city is surrounded by a semicircle of boulevards, beyond which lie the suburbs of Le Bouscat, Caudéran, Mérignac, Talence and Bégles. The principal promenades are situated close together near the centre of the city. They comprise the beautiful public garden, the allées de Tourny and the Place des Quinconces. The latter is planted with plane trees, among which stand two huge statues of Montaigne and Montesquieu, and terminates upon the quays with two rostral columns which serve as lighthouses. On its west side there is a monument to the Girondin deputies proscribed under the convention in 1793. At its south-west corner the Place des Quinconces opens into the Place de la Comédie, which contains the Grand Théâtre (18th century), the masterpiece of the architect Victor Louis. The Place de la Comédie, the centre of business in Bordeaux, is traversed by a street which, under the names of Cours du Chapeau-Rouge, rue de l'Intendance and rue Judaïque, runs from the Place de la Bourse and the quai de la Douane on the east to the outer boulevards on the west. Another important thoroughfare, the rue Sainte Cathérine, runs at right angles to the rue de l'Intendance and enters the Place de la Comédie on the south. The Pont de Bordeaux is continued by the Cours Victor Hugo, a curved street crossing the rue Sainte Cathérine and leading to the cathedral of St André. This church, dating from the 11th to the 14th centuries, is a building in the Gothic style with certain Romanesque features, chief among which are the arches in the nave. It consists of a large nave without aisles, a transept at the extremities of which are the main entrances, and a choir, flanked by double aisles and chapels and containing many works of art. Both the north and south façades are richly decorated with sculpture and statuary. Of the four towers flanking the principal portals, only those to the north are surmounted by spires. Near the choir stands an isolated tower. It contains the great bell of the cathedral and is known as the Clocher Pey-Berland, after the archbishop of Bordeaux who erected it in the 15th century. Of the numerous other churches of Bordeaux the most notable are St Seurin (11th to the 15th centuries), with a finely sculptured southern portal; Ste Croix (12th and 13th centuries), remarkable for its Romanesque façade; and St Michel, a fine Gothic building of the 15th and 16th centuries. The bell tower of St Michel, which has the highest spire (354 ft.) in the south of France, dates from the end of the 15th century, and, like that of the cathedral, stands apart from its church. The palace of the Faculties of Science and of Letters (1881-1886) contains the tomb of Michel de Montaigne. The prefecture, the hôtel de ville, the bourse and the custom-house belong to the 15th century. The law-courts and the hospital of St André (the foundation of which dates from 1390) belong to the first half of the 19th century. Of greater antiquarian interest is the Palais Gallien, situated near the public garden, consisting of remains of lofty arcades, vaulting and fragments of wall, which once formed part of a Roman amphitheatre. Bordeaux lost its fortifications in the 18th century, but four of the old gateways or triumphal arches belonging to that period still remain. Still older are the Porte de Cailhau, once the entrance to the Palais de l'Ombrière, which before its destruction was the residence of the duke of Aquitaine, and the Porte de l'Hôtel de Ville, the former of the 15th, the latter of the 13th and 16th centuries.

Bordeaux is the seat of an archbishop, the headquarters of the XVIII. army corps, the centre of an *académie* (educational division) and the seat of a court of appeal. A court of assizes is held there, and there are tribunals of first instance and of commerce, a council of trade-arbitrators, a chamber of commerce and a branch of the Bank of France. Its educational institutions include faculties of law, of science, of letters and of medicine and pharmacy, a faculty of Catholic theology, lycées, training colleges, a higher school of commerce, a chair of agriculture, a school of fine art and a naval school of medicine. There are several museums, including one with a large collection of pictures and sculptures, a library with over 200,000 volumes and numerous learned societies.

The trade of Bordeaux, the fourth port in France, is chiefly carried on by sea. Its port, 5½ m. long and on the average 550 yds. wide, is formed by the basin of the Garonne and is divided into two portions by the Pont de Bordeaux. That to the south is used only by small craft; that to the north is accessible to vessels drawing from 21 to 26 ft. according to the state of the tide. From 1000 to 1200 vessels can be accommodated in the harbour, which is lined on both sides by quays and sloping wharves served by railway lines. At the northen extremity of the harbour, on the left bank, there is a floating basin of 25 acres in extent, capable of receiving the largest vessels; it has over 1900 yds. of quays and is furnished with a repairing dock and with elaborate machinery for the loading and unloading of goods. In 1907 the construction of new docks behind this basin was begun. The city maintains commercial relations with nearly all countries, but chiefly with Great Britain, Spain, Argentina, Portugal and the United States. The most important line of steamers using the port is the South American service of the Messageries Maritimes. The total value of the exports and imports of Bordeaux averages between 25 and 26 millions sterling yearly. Of this amount exports make up 13½ millions, of which the sales of wine bring in about one quarter. The city is the centre of the trade in "Bordeaux" wines, and the wine-cellars of the quays are one of its principal sights. Other principal exports are brandy, hides and skins, sugar, rice, woollen and cotton goods, salt-fish, chemicals, oil-cake, pitwood, fruit, potatoes and other vegetables. The chief imports are wool, fish, timber, rice, wine, rubber, coal, oil-grains, hardware, agricultural and other machinery and chemicals. A large fleet is annually despatched to the cod-fisheries of Newfoundland and Iceland. The most important industry is ship-building and refitting. Ironclads and torpedo-boats as well as merchant vessels are constructed. Railway carriages are also built. The industries subsidiary to the wine-trade, such as wine-mixing, cooperage and the making of bottles, corks, capsules, straw envelopes and wooden cases, occupy many hands. There are also flour-mills, sugar-refineries, breweries, distilleries, oil-works, cod-drying works, manufactories of canned and preserved fruits, vegetables and meat, and of chocolate. Chemicals, leather, iron-ware, machinery and pottery are manufactured, and a tobacco factory employs 1500 hands.

Bordeaux (*Burdigala*) was originally the chief town of the Bituriges Vivisci. Under the Roman empire it became a flourishing commercial city, and in the 4th century it was made the capital of Aquitania Secunda. Ausonius, a writer of the 4th century, who was a native of the place, describes it as four-square and surrounded with walls and lofty towers, and celebrates its importance as one of the greatest educational centres of Gaul. In the evils that resulted from the disintegration of the empire Bordeaux had its full share, and did not recover its prosperity till the beginning of the 10th century. Along with Guienne it belonged to the English kings for nearly three hundred years (1154-1453), and was for a time the seat of the brilliant court of Edward the Black Prince, whose son Richard was born in the city. An extensive commerce was gradually developed between the Bordeaux merchants and their fellow-subjects in England,—London, Hull, Exeter, Dartmouth, Bristol and Chester being the principal ports with which they traded. The English administration was favourable to the liberties as well as to the trade of the city. In 1235 it received the right of electing its mayors, who were

assisted in the administration by a “jurade” or municipal council. The influence of Bordeaux was still further increased when several important towns of the region, among them St Emilion and Libourne, united in a federation under its leadership. The defeat of the English at the battle of Castillon in 1453 was followed, after a siege of three months, by the submission of Bordeaux to Charles VII. The privileges of the city were at once curtailed, and were only partially restored under Louis XI., who established there the parlement of Guienne. In 1548 the inhabitants resisted the imposition of the salt-tax by force of arms, a rebellion for which they were punished by the constable Anne de Montmorency with merciless severity.

The reformed religion found numerous adherents at Bordeaux, and after the massacre of St Bartholomew nearly three hundred of its inhabitants lost their lives. The 17th century was a period of disturbance. The city was for a time the chief support of the Fronde, and on two occasions, in 1653 and 1675, troops were sent to repress insurrections against royal measures. In the middle of the 18th century, a period of commercial and architectural activity for Bordeaux, the marquis de Tourny, *intendant* of Guienne, did much to improve the city by widening the streets and laying out public squares. It was the headquarters of the Girondists at the Revolution, and during the Reign of Terror suffered almost as severely as Lyons and Marseilles. Its commerce was greatly reduced under Napoleon I. In 1814 it declared for the house of Bourbon; and Louis XVIII. afterwards gave the title of duc de Bordeaux to his grand-nephew, better known as the comte de Chambord. In 1870 the French government was transferred to Bordeaux from Tours on the approach of the Germans to the latter city.

See Camille Jullian, *Hist. de Bordeaux, depuis les origines jusqu’en 1895* (Bordeaux, 1895); T. Malvezin, *Hist. du commerce de Bordeaux* (Bordeaux, 1892); *Bordeaux, aperçu historique, sol, population, industrie, commerce, administration* (Bordeaux, 1892).

BORDEN, SIR FREDERICK WILLIAM (1847-), Canadian statesman, was born at Cornwallis, Nova Scotia, on the 14th of May 1847. He was educated at King’s College, Windsor, and at Harvard University, and for some years practised medicine at Canning, Nova Scotia. In 1874 he was elected to the Canadian parliament as Liberal member for King’s county. In 1896 he became minister of militia and defence in the Liberal ministry.

BORDEN, ROBERT LAIRD (1854-), Canadian statesman, was born at Grand Pré, Nova Scotia, on the 26th of June 1854. In 1878 he was called to the bar, and became a leading lawyer in his native province. In 1896 he was elected to the Canadian parliament for the city of Halifax, but later lost his seat there and was elected for Carlton. In February 1901, on the resignation of Sir Charles Tupper, he became leader of the Conservative opposition. At the general election of 1908 he was returned again for Halifax.

BORDENTOWN, a city of Burlington county, New Jersey, U.S.A., on the E. bank of the Delaware river, 6 m. S. of Trenton and 28 m. N.E. of Philadelphia. Pop. (1890) 4232; (1900) 4110; (1905) 4073; (1910) 4250. It is served by the Pennsylvania railway, the Camden & Trenton railway (an electric line, forming part of the line between Philadelphia and New York) and by freight and passenger steamboat lines on the Delaware. Bordentown is attractively situated on a broad, level plain, 65 ft. above the river, with wide, beautifully shaded streets. The city is the seat of the Bordentown Military Institute (with the Woodward memorial library), of the state manual training and industrial school for coloured youth, of the St Joseph’s convent and mother-house of the Sisters of Mercy, and of St Joseph’s academy for girls. There are ship-yards, iron foundries and forges, machine shops, shirt factories, a pottery for the manufacture of sanitary earthenware, a woollen mill and canning factories. The first settlers on the site of the city were several Quaker families who came in the 18th century. Bordentown was laid out by Joseph Borden, in whose honour it was named; was incorporated as a borough in 1825; was re-incorporated in 1849, and was chartered as a city in 1867. It was the home for some years of Francis Hopkinson and of his son Joseph Hopkinson (whose residences are still standing), and from 1817 to 1832 and in 1837-1839 was the home of Joseph Bonaparte, ex-king of Spain, who lived on a handsome estate known as “Bonaparte’s Park,” which he laid out with considerable magnificence. Here he entertained many distinguished visitors, including Lafayette. The legislature of New Jersey passed a special law, enabling him, as an alien, to own real property, and it is said to have been in reference to this that the state received its nickname “Spain.” Prince Napoleon Lucien Charles Murat, the second son of Joachim Murat, also lived here for many years; and the estate known as “Ironsides” was long the home of Rear-Admiral Charles Stewart. The Camden & Amboy railway, begun in 1831 and completed from Bordentown to South Amboy (34 m.) in 1832, was one of the first railways in the United States; in September 1831 the famous engine “Johnny Bull,” built in England and imported for this railway, had its first trial at Bordentown, and a monument now marks the site where the first rails were laid.

See E.M. Woodward, *Bonaparte’s Park and the Murats* (Trenton, 1879).

BORDERS, THE, a name applied to the territory on both sides of the boundary line between England and Scotland. The term has also a literary and historical as well as a geographical sense, and is most frequently employed of the Scottish side. The line begins on the coast of Berwickshire at a spot 3 m. N. by W. of Berwick, and, after running a short distance W. and S., reaches the Tweed near the village of Paxton, whence it keeps to the river to a point just beyond Carham. There it strikes off S.S.E. to the Cheviot Hills, the watershed of which for 35 m. constitutes the boundary, which is thereafter formed by a series of streams—Bells Burn, the Kershope, Liddel and Esk. After following the last named for 1 m. it cuts across country due west to the Sark, which it follows to the river's mouth at the head of the Solway Firth. The length of the boundary thus described is 108 m., but in a direct line from the Solway to the North Sea the distance is only 70 m. At the extreme east end a small district of 8 sq. m., consisting of the tract north of the Tweed which is not included in Scotland, forms the "bounds" or "liberties" of Berwick, or the country of the borough and town of Berwick-on-Tweed. At the extreme west between the Sark and Esk as far up the latter as its junction with the Liddel, there was a strip of country, a "No man's land," for generations the haunt of outlaws and brigands. This was called the Debatable Land, because the possession of it was a constant source of contention between England and Scotland until its boundaries were finally adjusted in 1552. The English Border counties are Northumberland and Cumberland, the Scottish Berwick, Roxburgh and Dumfries; though historically, and still by usage, the Scottish shires of Selkirk and Peebles have always been classed as Border shires. On the English side the region is watered by the Till, Bowmont, Coquet, Rede and North Tyne; on the Scottish by the Tweed, Whiteadder, Leet, Kale, Jed, Kershope, Liddel, Esk and Sark. Physically there is a marked difference between the country on each side. On the southern it mostly consists of lofty, bleak moorland, affording subsistence for sheep and cattle, and rugged glens and ravines, while on the northern there are many stretches of fertile soil, especially in the valleys and dales, and the landscape is often romantic and beautiful. Railway communication is supplied by the east coast route to Berwick, the Waverley route through Liddesdale, the London & North-Western by Carlisle, the North British branch from Berwick to St Boswells, and the North Eastern lines from Berwick to Kelso, Alnwick to Coldstream, and Newcastle to Carlisle.

At frequent intervals during a period of 1500 years the region was the scene of strife and lawlessness. The Roman road of Watling Street crossed the Cheviots at Brownhartlaw (1664 ft.), close to the camp of *Ad Fines*, by means of which the warlike Brigantes on the south and the Gadeni and Otadeni on the north were held in check, while another Roman road, the Wheel Causeway, passed into Scotland near the headwaters of the North Tyne and Liddel. (For early history see Lothian; Northumbria; Strathclyde.) In the 12th century were founded the abbeys of Hexham and Alnwick, the priory church of Lindisfarne and the cathedral of Carlisle on the English side, and on the Scottish the abbeys of Jedburgh, Kelso, Melrose and Dryburgh. The deaths of Alexander III. (1286) and Margaret the Maid of Norway (1290), whose right to the throne had been acknowledged, plunged the country into the wars of the succession and independence, and until the union of the crowns in 1603 the borders were frequently disturbed. Berwick and Carlisle were repeatedly assailed, and battles took place at Halidon Hill (1333), Otterburn (1388), Nisbet (1402), Homildon (1402), Piperden (1435), Hedgeley Moor (1464), Flodden (1513), Solway Moss (1542), and Ancrum Moor (1544), in addition to many fights arising out of family feuds and raids fomented by the Armstrongs, Eliots, Grahams, Johnstones, Maxwells and other families, of which the most serious were the encounters at Arkenholme (Langholm) in 1455, the Raid of Reidswire (1575), and the bloody combat at Dryfe Sands (1593). The English expeditions of 1544 and 1545 were exceptionally disastrous, since they involved the destruction of the four Scottish border abbeys, the sack of many towns, and the obliteration of Roxburgh. The only other important conflict belongs to the Covenanters' time, when the marquess of Montrose was defeated at Philiphaugh in 1645. Partly for the defence of the kingdoms and partly to overawe the freebooters and mosstroopers who were a perpetual menace to the peace until they were suppressed in the 17th century, castles were erected at various points on both sides of the border.

Even during the period when relations between England and Scotland were strained, the sovereigns of both countries recognized it to be their duty to protect property and regulate the lawlessness of the borders. The frontier was divided into the East, Middle and West Marches, each under the control of an English and a Scots warden. The posts were generally filled by eminent and capable men who had to keep the peace, enforce punishment for breach of the law, and take care that neither country encroached on the boundary of the other. The wardens usually conferred once a year on matters of common interest, and as a rule their meetings were conducted in a friendly spirit, though in 1575 a display of temper led to the affair of the Raid of Reidswire. The appointment was not only one of the most important in this quarter of the kingdom, but lucrative as well, part of the fines and forfeits falling to the warden, who was also entitled to ration and forage for his retinue. On the occasion of his first public progress to London, James I. of England attended service in Berwick church (March 27, 1603) "to return thanks for his peaceful entry into his new dominions." Anxious to blot out all memory of the bitter past, he forbade the use of the word "Borders," hoping that the designation "Middle Shires" might take its place. Frontier fortresses were also to be dismantled and their garrisons reduced to nominal strength. In course of time this policy had the desired effect, though the expression "Borders" proved too convenient geographically to be dropped, the king's proposed amendment being in point of fact merely sentimental and, in the relative positions then and now of England and Scotland, meaningless. Some English strongholds, such as Alnwick, Chillingham, Ford and Naworth, have been modernized; others, like Norham, Wark and Warkworth, are picturesque ruins; but most of the Scottish fortresses have been demolished and their sites built over, or are now represented by grass-grown mounds. Another familiar feature in the landscape is the chain of peel towers crossing the country from coast to coast. Many were homes of marauding chiefs, and nearly all were used as beacon-stations to give alarm of foray or invasion. Early in the 18th century the Scottish gipsies found a congenial home on the Roxburghshire side of the Cheviots; and at a later period the Scottish border became notorious for a hundred years as offering hospitality to runaway couples who were clandestinely married at Gretna Green, Coldstream or Lamberton. The toll-house of Lamberton displayed the following intimation —"Ginger-beer sold here and marriages performed on the most reasonable terms."

Border ballads occupy a distinctive place in English literature. Many of them were rescued from oblivion by Sir Walter Scott, who ransacked the district for materials for his *Minstrelsy of the Scottish Border*, which appeared in 1802 and 1803. Border traditions and folklore, and the picturesque, pathetic and stirring incidents of which the country was so often the scene, appealed strongly to James Hogg ("the Ettrick Shepherd"), John Wilson ("Christopher North"), and John Mackay Wilson (1804-1835), whose *Tales of the Borders*, published in

1835, long enjoyed popular favour.

Besides the works just mentioned see Sir Herbert Maxwell, *History of Dumfries and Galloway* (1896); George Ridpath, *Border History of England and Scotland* (1776); Professor John Veitch, *History and Poetry of the Scottish Border* (1877); Sir George Douglas, *History of the Border Counties* (Scots), (1890): W.S. Crockett, *The Scott Country* (1902).

BORDIGHERA, a town of Liguria, Italy, in the province of Porto Maurizio, 91 m. S.W. of Genoa by rail, and 3 m. E.N.E. of Ventimiglia. Pop. (1901) 4673. It is a favourite winter resort, especially for visitors from England, and is situated in beautiful coast scenery. It has fine gardens, and its flowers and palms are especially famous: the former are largely exported, while the latter serve for the supply of palm branches for St Peter's at Rome and other churches on Palm Sunday. The new museum contains a unique collection of the flora of the Riviera. From 1682 until the Napoleonic period, Bordighera was the capital of a small republic of the villages of the neighbouring valleys.

BORDONE, PARIS (1495-1570), Venetian painter, was born at Treviso, and entered the *bottega* of Titian in 1509. Vasari, to whom we are indebted for nearly all the facts of Bordone's life—later research has not added much to our knowledge—holds that he did not spend many years with Titian and set himself to imitate the manner of Giorgione to the utmost of his power. As a matter of fact, the Giorgionesque traits in Bordone's earlier works are derived entirely from Titian, whom he imitated so closely that to this day some of his paintings pass under Titian's name. Crowe and Cavalcaselle and Dr Bode ascribe to Bordone the "Baptism of Christ" in the Capitoline gallery, but Morelli sees in it an early work of Titian. Paris Bordone subsequently executed many important mural paintings in Venice, Treviso and Vicenza, all of which have perished. In 1538 he was invited to France by Francis I., at whose court he painted many portraits, though no trace of them is to be found in French collections, the two portraits at the Louvre being later acquisitions. On his return journey he undertook works of great importance for the Fugger palace at Augsburg, which again have been lost sight of. Bordone's pictures are of very unequal merit. They have a certain nobility of style, and that golden harmony of colour which he derived from Titian, together with the realistic conception of the human figure and the dignified character of his portraiture. On the other hand, his nudes are a little coarse in form, and the action of his figures is frequently unnatural and affected. A true child of the Renaissance, he also painted a number of religious pictures, numerous mythological scenes, allegories, nymphs, cupids and subjects from Ovid's fables, but he excelled as a portraitist. His principal surviving work is the "Fisherman and Doge" at the Venice Academy. The National Gallery, London, has a "Daphnis and Chloe" and a portrait of a lady, whilst a "Holy Family" from his brush is at Bridgwater House. Other important works of his are the "Madonna" in the Tadini collection at Lovere, the paintings in the Duomo of Treviso, two mythological pictures at the Villa Borghese and the Doria palace in Rome, the "Chess Players" in Berlin, a very little-known portrait of superb quality in the possession of the landgrave of Hesse at Kronberg, and a "Baptism of Christ" in Philadelphia. Besides these, there are examples of his art in Bergamo, Milan, Genoa, Padua, Siena, Venice, Florence, Munich, Dresden and Vienna.

Beyond some references in general works on Italian painting, very little has been written on Paris Bordone since the days of Vasari. In 1900 the committee of the fourth centenary of Paris Bordone, Treviso, published L. Barlo and G. Biscaro's *Della Vita e delle Opere di Paris Bordone*; and the *Nuova Antologia* (November 16, 1900) contains a sixteen-page paper on Paris Bordone by P.G. Molmenti.

(P. G. K.)

BORE, a high tidal wave rushing up a narrow estuary or tidal river. The bore of the Severn is produced by a tide that rises 18 ft. in an hour and a half. This body of water becomes compressed in the narrowing funnel-shaped estuary, and heaped up into an advancing wave extending from bank to bank. The phenomenon is also particularly well illustrated in the Bay of Fundy. The origin of this word is doubtful, but it is usually referred to a Scandinavian word *bāra*, a wave, billow. The other name by which the phenomenon is known, "eagre," is also of unknown origin. There is, of course, no connexion with "bore," to make a hole by piercing or drilling, which is a common Teutonic word, cf. Ger. *bohren*, the Indo-European root being seen in Lat. *forare*, to pierce, Gr. φάρος, plough. For the making of deep holes for shafts, wells, &c., see Boring. The substantival use of this word is generally confined to the circular cavity of objects of tubular shape, particularly of a gun, hence the internal diameter of a gun, its "calibre" (see Gun). A "bore" is also a tiresome, wearying person, particularly one who persistently harps on one subject, in or out of season, whatever interest his audience may take in it. This has generally been taken to be merely a metaphorical use of "bore," to pierce. The earliest sense, however, in which it is found in English (1766, in certain letters printed in Jesse's *Life of George Selwyn*) is that of *ennui*, and a French origin is suggested. The *New English Dictionary* conjectures a possible source in Fr. *bourrer*, to stuff, satiate.

BOREAS, in Greek mythology, a personification of the north wind. He was described as the son of Astraeus and Eos, brother of Hesperus, Notus and Zephyrus. His dwelling-place was on Mount Haemus in Thrace, or at Salmydessus, near the country of the Hyperboreans. He was said to have carried off the beautiful Oreithyia, a daughter of Erechtheus, king of Athens, when he found her leading the dance at a festival, or gathering flowers on the banks of the Ilissus or some other spot in the neighbourhood of Athens. He had before wooed her in vain, and now carried her off to Mount Haemus, where they lived as king and queen of the winds, and had two sons, Zetes and Calaïs, and two daughters, Cleopatra and Chione (Apollodorus iii. 15; Ovid, *Metam.* vi. 677). For the loss of Oreithyia the Athenians in after times counted on Boreas's friendliness, and were assured of it when he sent storms which wrecked the Persian fleet at Athos and at Sepias (Herodotus vii. 189). For this they erected to him a sanctuary or altar near the Ilissus, and held a festival (Boreasmos) in his honour. Thurii also, which was a colony of Athens, offered sacrifice to him as Euergetes every year, because he had destroyed the hostile fleet of Dionysius the elder (Aelian, *Var. Hist.* xii. 61). In works of art Boreas was represented as bearded, powerful, draped against cold, and winged. On the Tower of the Winds at Athens he is figured holding a shell, such as is blown by Tritons. Boreas carrying off Oreithyia is the subject of a beautiful bronze relief in the British Museum, found in the island of Calymna. The same subject occurs frequently on painted Greek vases.

BOREL, PETRUS, whose full name was Pierre Joseph Borel d'Hauterive (1809-1859), French writer, was born at Lyons on the 26th of June 1809. His father had been ruined by taking part in the resistance offered by the Lyonnese royalists against the Convention, and Petrus Borel was educated in Paris to be an architect. He soon abandoned his profession to become one of the most violent partisans of the Romantic movement. His extravagant sentiments were illustrated in various volumes: *Rhapsodies* (1832), poems; *Champavert, contes immoraux* (1833); *Madame Putiphar* (1839), &c. His works did not rescue him from poverty, but through the kindness of Théophile Gautier and Mme de Girardin he obtained a small place in the civil service. He died at Mostaganem in Algeria on the 14th of July 1859.

See Jules Clarétie, *Petrus Borel, le Lycanthrope* (1865); and Ch. Asselineau, *Bibliographie romantique* (1872).

BORELLI, GIOVANNI ALFONSO (1608-1679), Italian physiologist and physicist, was born at Naples on the 28th of January 1608. He was appointed professor of mathematics at Messina in 1649 and at Pisa in 1656. In 1667 he returned to Messina, but in 1674 was obliged to retire to Rome, where he lived under the protection of Christina, queen of Sweden, and died on the 31st of December 1679. His best-known work is *De motu animalium* (Rome, 1680-1681), in which he sought to explain the movements of the animal body on mechanical principles; he thus ranks as the founder of the iatrophysical school. In a letter, *Del movimento della cometa apparsa il mese di decembre 1664*, published in 1665 under the pseudonym Pier Maria Mutoli, he was the first to suggest the idea of a parabolic path; and another of his astronomical works was *Theorica mediceorum planetarum ex causis physicis deducta* (Florence, 1666), in which he considered the influence of attraction on the satellites of Jupiter. He also wrote: *Della Causa delle Febbri maligni* (Pisa, 1658); *De Renum usu Judicium* (Strassburg, 1664); *Euclides Restitutus* (Pisa, 1658); *Apollonii Pergaei Conicorum libri v., vi. et vii.* (Florence, 1661); *De vi percussionis* (Bologna, 1667); *Meteorologia Aetnea* (Reggio, 1669); and *De motionibus naturalibus a gravitate pendentibus* (Bologna, 1670).

BORGÅ (Finnish *Porvoo*), a seaport in the province of Nyland, grand duchy of Finland, situated at the entrance of the river Borgå into the Gulf of Finland, about 33 m. by rail N.W. of Helsingfors. Pop. (1810) 1693; (1870) 3478; (1904) 5255. It is the seat of a Lutheran bishopric which extends over the provinces of Viborg and St Michel with portions of Tavastehus and Nyland; it possesses a beautiful cathedral, and a high school (where the well-known Finnish poet Runeberg lectured for many years), and is the seat of a court of appeal. The weaving of sail-cloth and the manufacture of tobacco are the principal industries, and the chief articles of trade are wood, butter and furs. Borgå was once a city of great dignity and importance, but the rapid growth of Helsingfors has somewhat eclipsed it. In 1809, when the estates of Finland were summoned to a special diet to decide the future of the country, Borgå was the place of meeting, and it was in the cathedral that the emperor Alexander I. pledged himself as grand duke of Finland to maintain the constitution and liberties of the grand duchy.

BORGHESE, a noble Italian family of Sienese origin, first mentioned in 1238, a member of which, Marcantonio Borghese, settled in Rome and was the father of Camillo Borghese (1550-1620), elected pope under the title of Paul V. (1605). Paul created his nephew prince of Vivero on the 17th of November 1609, and Philip III. of Spain conferred the title of prince of Sulmona on him in 1610. The family took its place among the higher Roman nobility by the marriage of the prince's son Paolo with Olimpia, heiress of the Aldobrandini

family, in 1614. In 1803 Camillo Filippo Ludovico, Prince Borghese (b. 1775), married Pauline, sister of the emperor Napoleon, and widow of General Leclerc. In 1806 he was made duke of Guastalla, and for some years acted as governor of the Piedmontese and Genoese provinces. After the fall of Napoleon he fixed his residence at Florence, where he died in 1832. The Borghese palace at Rome is one of the most magnificent buildings in the city, and contained a splendid gallery of pictures, most of which have been transferred to the Villa Borghese outside the Porto del Popolo, now Villa Umberto I., the property of the Italian government.

See A. von Reumont, *Geschichte der Stadt Rom*, iii. 605, 609 617, &c.; *Almanach de Gotha* (Gotha, 1902); J.H. Douglas, *The Principal Noble Families of Rome* (Rome, 1905).

BORGHESI, BARTOLOMMEO (1781-1860), Italian antiquarian, was born at Savignano, near Rimini, on the 11th of July 1781. He studied at Bologna and Rome. Having weakened his eyesight by the study of documents of the middle ages, he turned his attention to epigraphy and numismatics. At Rome he arranged and catalogued several collections of coins, amongst them those of the Vatican, a task which he undertook for Pius VII. In consequence of the disturbances of 1821, Borghesi retired to San Marino, where he died on the 16th of April 1860. Although mainly an enthusiastic student, he was for some time podestà of the little republic. His monumental work, *Nuovi Frammenti dei Fasti Consolari Capitolini* (1818-1820), attracted the attention of the learned world as furnishing positive bases for the chronology of Roman history, while his contributions to Italian archaeological journals established his reputation as a numismatist and antiquarian. Before his death, Borghesi conceived the design of publishing a collection of all the Latin inscriptions of the Roman world. The work was taken up by the Academy of Berlin under the auspices of Mommsen, and the result was the *Corpus Inscriptionum Latinarum*. Napoleon III. ordered the publication of a complete edition of the works of Borghesi. This edition, in ten volumes, of which the first appeared in 1862, was not completed until 1897.

BORGIA, CESARE, duke of Valentinois and Romagna (1476-1507) was the son of Pope Alexander VI. by Vanozza dei Cattanei. He was born at Rome while his father was cardinal, and on the latter’s elevation to the papacy (1492) he was created archbishop of Valencia, and a year later cardinal. Cesare was Alexander’s favourite son, and it was for him that the pope’s notorious nepotism was most extensively practised. In the early years of his father’s pontificate he led a profligate life at the Vatican. When Charles VIII. left Rome for the conquest of Naples (January 25, 1495), Cesare accompanied him as a hostage for the pope’s good behaviour, but he escaped at Velletri and returned to Rome. He soon began to give proofs of the violence for which he afterwards became notorious; when in 1497 his brother Giovanni, duke of Gandia, was murdered, the deed was attributed, in all probability with reason, to Cesare. It was suggested that the motive of the murder was the brothers’ rivalry in the affection of Donna Sancha, wife of Giuffrè, the pope’s youngest son, while there were yet darker hints at incestuous relations of Cesare and the duke with their sister Lucrezia. But it is more probable that Cesare, who contemplated exchanging his ecclesiastical dignities for a secular career, regarded his brother’s splendid position with envy, and was determined to enjoy the whole of his father’s favours.

In July 1497 Cesare went to Naples as papal legate and crowned Frederick of Aragon king. Now that the duke of Gandia was dead, the pope needed Cesare to carry out his political schemes, and tried to arrange a wealthy marriage for him. Cesare wished to marry Carlotta, the daughter of the king of Naples, but both she and her father resolutely refused an alliance with “a priest, the bastard of a priest.” In August 1498, Cesare in the consistory asked for the permission of the cardinals and the pope to renounce the priesthood, and the latter granted it “for the good of his soul.” On the 1st of October he set forth for France with a magnificent retinue as papal legate to Louis XII., to bring him the pope’s bull annulling his marriage with Jeanne of France (Louis wished to marry Anne of Brittany). In exchange he received the duchy of Valentinois, as well as military assistance for his own enterprises. He found Carlotta of Naples in France, and having again tried to win her over in vain, he had to content himself with Charlotte d’Albret, sister of the king of Navarre (May 1499). Alexander now contemplated sending Cesare to Romagna to subdue the turbulent local despots, and with the help of the French king carve a principality for himself out of those territories owing nominal allegiance to the pope. Cesare made Cesena his headquarters, and with an army consisting of 300 French lances, 4000 Gascons and Swiss, besides Italian troops, he attacked Imola, which surrendered at once, and then besieged Forli, held by Caterina Sforza (*q.v.*), the widow of Girolamo Riario. She held out gallantly, but was at last forced to surrender on the 22nd of January 1500; Cesare treated her with consideration, and she ended her days in a convent. The Sforzas having expelled the French from Milan, Cesare returned to Rome in February, his schemes checked for the moment; his father rewarded him for his successes by making him *gonfaloniere* of the church and conferring many honours on him; he remained in Rome and took part in bull fights and other carnival festivities. In July occurred the murder of the duke of Bisceglie, Lucrezia Borgia’s third husband. He was attacked by assassins on the steps of St Peter’s and badly wounded; attendants carried him to a cardinal’s house, and, fearing poison, he was nursed only by his wife and Sancha, his sister-in-law. Again Cesare was suspected as the instigator of the deed, and in fact he almost admitted it himself. Bisceglie was related to the Neapolitan dynasty, with whose enemies the pope was allied, and he had had a quarrel with Cesare. When it appeared that he was recovering from his wounds, Cesare had him murdered, but not apparently without provocation, for, according to the Venetian ambassador Cappello, the duke had tried to murder Cesare first.

In October 1500 Cesare again set out for the Romagna, on the strength of Venetian friendship, with an army of 10,000 men. Pandolfo Malatesta of Rimini and Giovanni Sforza of Pesaro fled, and those cities opened their gates to Cesare. Faenza held out, for the people were devoted to their lord, Astorre Manfredi, a handsome and virtuous youth of eighteen. Manfredi surrendered in April 1501, on the promise that his life should be spared;

but Cesare broke his word, and sent him a prisoner to Rome, where he was afterwards foully outraged and put to death. After taking Castel Bolognese he returned to Rome in June, to take part in the Franco-Spanish intrigues for the partition of Naples. He was now lord of an extensive territory, and the pope created him duke of Romagna. His cruelty, his utter want of scruple, and his good fortune made him a terror to all Italy. His avidity was insatiable and he could brook no opposition; but, unlike his father, he was morose, silent and unsympathetic. His next conquests were Camerino and Urbino, but his power was now greatly shaken by the conspiracy of La Magione (a castle near Perugia where the plotters met). Several of the princes deposed by him, the Orsinis, and some of his own captains, such as Vitellozzo Vitelli (*q.v.*), Oliverotto da Fermo, and G.P. Baglioni, who had been given estates but feared to lose them, joined forces to conspire against the Borgias. Risings broke out at Urbino and in Romagna, and the papal troops were defeated; Cesare could find no allies, and it seemed as though all Italy was about to turn against the hated family, when the French king promised help, and this was enough to frighten the confederates into coming to terms. Most of them had shown very little political or military skill, and several were ready to betray each other. But Cesare, while trusting no one, proved a match for them all. During his operations in northern Romagna, Vitelli, Oliverotto, Paolo Orsini, and the duke of Gravina, to show their repentance, seized Senigallia, which still held for the duke of Urbino, in his name. Cesare arrived at that town, decoyed the unsuspecting *condottieri* into his house, had them all arrested, and two of them, Vitelli and Oliverotto, strangled (December 31, 1502).

He was back in Rome early in 1503, and took part in reducing the last rebel Orsinis. He was gathering troops for a new expedition in central Italy in the summer, when both he and his father were simultaneously seized with fever. The pope died on the 18th of August, while Cesare was still incapacitated, and this unfortunate coincidence proved his ruin; it was the one contingency for which he had not provided. On all sides his enemies rose up against him; in Romagna the deposed princes prepared to regain their own, and the Orsinis raised their heads once more in Rome. Cesare's position was greatly shaken, and when he tried to browbeat the cardinals by means of Don Michelotto and his bravos, they refused to be intimidated; he had to leave Rome in September, trusting that the Spanish cardinals would elect a candidate friendly to his house. At the conclave Francesco Todeschini-Piccolomini was elected as Pius III., and he showed every disposition to be peaceful and respectable, but he was old and in bad health. Cesare's dominion at once began to fall to pieces; Guidobaldo, duke of Urbino, returned to his duchy with Venetian help; and the lords of Piombino, Rimini and Pesaro soon regained their own; Cesena, defended by a governor faithful to Cesare, alone held out. Pius III. died on the 18th of October 1503, and a new conclave was held. Cesare, who could still count on the Spanish cardinals, wished to prevent the election of Giuliano della Rovere, the enemy of his house, but the latter's chances were so greatly improved that it was necessary to come to terms with him. On the 1st of November he was elected, and assumed the name of Julius II. He showed no ill-will towards Cesare, but declared that the latter's territories must be restored to the church, for "we desire the honour of recovering what our predecessors have wrongfully alienated." Venice hoped to intervene in Romagna and establish her protectorate over the principalities, but this Julius was determined to prevent, and after trying in vain to use Cesare as a means of keeping out the Venetians, he had him arrested. Borgia's power was now at an end, and he was obliged to surrender all his castles in Romagna save Cesena, Forli and Bettinoro, whose governors refused to accept an order of surrender from a master who was a prisoner. Finally, it was agreed that if Cesare were set at liberty he would surrender the castles; this having been accomplished, he departed for Naples, where the Spaniards were in possession. The Spanish governor, Gonzalo de Cordova, had given him a safe-conduct, and he was meditating fresh plans, when Gonzalo arrested him by the order of Ferdinand of Spain as a disturber of the peace of Italy (May 1504). In August he was sent to Spain, where he remained a prisoner for two years; in November 1506 he made his escape, and fled to the court of his brother-in-law, the king of Navarre, under whom he took service. While besieging the castle of Viana, held by the rebellious count of Lerin, he was killed (March 12, 1507).

Cesare Borgia was a type of the adventurers with which the Italy of the Renaissance swarmed, but he was cleverer and more unscrupulous than his rivals. His methods of conquest were ferocious and treacherous; but once the conquest was made he governed his subjects with firmness and justice, so that his rule was preferred to the anarchy of factions and local despots. But he was certainly not a man of genius, as has long been imagined, and his success was chiefly due to the support of the papacy; once his father was dead his career was at an end, and he could no longer play a prominent part in Italian affairs. His fall proved on how unsound a basis his system had been built up.

The chief authorities for the life of Cesare Borgia are the same as those of Alexander VI., especially M. Creighton's *History of the Papacy*, vol. v. (London, 1897); F. Gregorovius's *Geschichte der Stadt Rom*, vol. vii. (Stuttgart, 1881); and P. Villari's *Machiavelli* (London 1892); also C. Yriarte, *César Borgia* (Paris, 1889), an admirable piece of writing; Schubert-Soldern, *Die Borgia und ihre Zeit* (Dresden, 1902), which contains the latest discoveries on the subject; and E. Alvisi, *Cesare Borgia, Duca di Romagna* (Imola, 1878).

(L. V.*)

BORGIA, FRANCIS (1510-1572), Roman Catholic saint, duke of Gandia, and general of the order of Jesuits, was born at Gandia (Valencia) on the 10th of October 1510, and from boyhood was remarkable for his piety. Educated from his twelfth year at Saragossa under the charge of his uncle the archbishop, he had begun to show a strong inclination towards the monastic life, when his father sent him in 1528 to the court of Charles V. Here he distinguished himself, and on his marriage with Eleanor de Castro, a Portuguese lady of high rank, he was created marquis of Lombay, and was appointed master of the horse to the empress. He accompanied Charles on his African expedition in 1535, and also into Provence in 1536; and on the death of the empress in 1539 he was deputed to convoy the body to the burial-place in Granada. This sad duty confirmed his determination to leave the court, and also, should he survive his consort, to embrace the monastic life. On his return to Toledo, however, new honours were thrust upon him, much against his will; he was made viceroy of Catalonia and commander of the order of St James. At Barcelona, the seat of his government, he lived a life of great austerity, but discharged his official duties with energy and efficiency until 1543, when, having succeeded his father in the dukedom, he at length obtained permission to resign his viceroyalty and to retire to a more

congenial mode of life at Gandia. Having already held some correspondence with Ignatius Loyola, he now powerfully encouraged the recently founded order of Jesus. One of his first cares at Gandia was to build a Jesuit college; and on the death of Eleanor in 1546, he resolved to become himself a member of the society. The difficulties arising from political and family circumstances were removed by a papal dispensation, which allowed him, in the interests of his young children, to retain his dignities and worldly possessions for four years after taking the vows. In 1550 he visited Rome, where he was received with every mark of distinction, and where he furnished the means for building the Collegium Romanum. Returning to Spain in the following year, he formally resigned his rank and estate in favour of his eldest son, assumed the Jesuit habit, was ordained priest, and entered upon a life of penance and prayer. At his own earnest request, seconded by Loyola, a proposal that he should be created a cardinal by Julius III. was departed from; and at the command of his superior he employed himself in the work of itinerant preaching. In 1554 he was appointed commissary-general of the order in Spain, Portugal and the Indies, in which capacity he showed great activity, and was successful in founding many new and thriving colleges. In 1556, shortly after Charles V. retired, Borgia had an interview with him, but would not yield to his inducements to transfer his allegiance to the older order of Hieronymites. Some time afterwards Borgia was employed by Charles to conduct negotiations with reference to a project which was to secure for Don Carlos of Spain the Portuguese succession in the event of the death of his cousin Don Sebastian. On the death of Lainez in 1565, Francis Borgia was chosen to succeed him as third general of the Jesuits. In this capacity he showed great zeal and administrative skill; and so great was the progress of the society under his government that he has sometimes been called “its second founder,” The peculiarities which are most characteristic of the order were, however, derived from Loyola and Lainez, rather than from Borgia, whose ideal was a simple monasticism rather than a life of manifold and influential contact with the world. He died at Rome on the 30th of September 1572. He was beatified by Urban VIII. in 1624, and canonized by Clement X. in 1671, his festival being afterwards (1683) fixed by Innocent XI. for the 10th of October.

Several works by St Francis Borgia have been published, the principal of these being a series of *Exercises* similar to the *Exercitia Spiritualia* of Loyola, and a treatise *Rhetorica Concionandi*. The *Opera Omnia* were published at Brussels in 1675. His life was written by his confessor Pedro de Ribadeneira. See also A. Butler’s *Lives of the Saints*, and the *Breviarium Romanum* (second nocturn for October 10).

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