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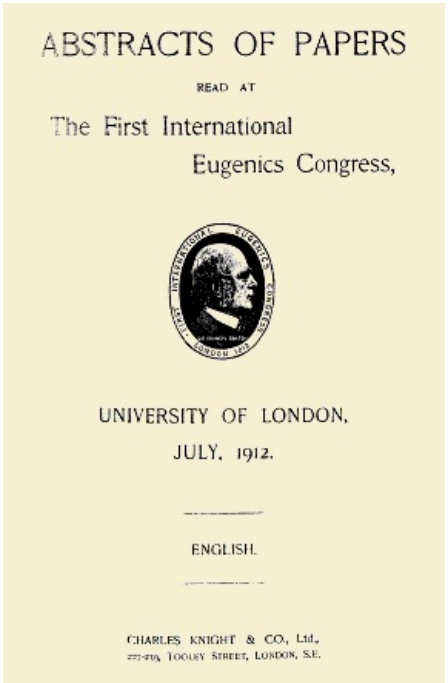
ABSTRACTS OF PAPERS

READ AT

The First International Eugenics Congress,

UNIVERSITY OF LONDON,

JULY, 1912.

ENGLISH.

CHARLES KNIGHT & CO., Ltd.,

Table of Contents

CATALOGUE OF THE EXHIBITION

PROGRAMME

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ENGLISH.

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[3]

Section I.

Biology and Eugenics.

Section II.

Practical Eugenics.

Section IIa.

Education and Eugenics.

[4]

Section III.

Sociology and Eugenics

.

Section IV.

Medicine and Eugenics

---

[5]

Section I.

Biology and Eugenics.

VARIATION AND HEREDITY IN MAN. (Abstract.)

By Professor G. Sergi, *Professor of Anthropology, Rome*.

In his paper Professor G. Sergi wishes to show that in man after his morphological characteristics are established there occur no profound variations to change the typical forms which are naturally persistent.

The principal discussion concerns the different forms of the skull which are important as characteristics of race. Professor Sergi distinguishes in the human skull two principal and primordial forms: the dolichomorphic and the brachymorphic are both very ancient, as they are found contemporaneously in European human fossils. Consequently he attacks the idea of the transformation of one form into another. He does not find it demonstrated that the dolichomorphic type is transformed into the brachymorphic, and considers the causes adduced for this supposed transformation insufficient. It is neither the effect of environment of the plains or of the mountains, or the climatic influence of extreme cold, or the increase of volume of the brain supposed to be due to greater cerebral activity owing to a more developed culture, that the form of the skull is transformed into another type. All these suppositions are contrary to facts, because dolichomorphic and brachymorphic skulls are found alike in mountain and plain, in northern and southern regions, among primitive and civilized populations, in fact without any distinction.

The mutations that are believed to be found in the different populations are due to the effect of intermixture and penetration of new demographical elements, and not to the transformation of forms. That is also proved by the crossing of the two different human types from which no intermediary forms are derived: but instead there occurs in the heredity a segregation analagous to that under the Mendelian theory. If this were not so, to-day after many thousands of years of intermixture of the most diverse races, there would be but a single form derived from transformation; the demonstration of the facts proves that this has not occurred.

There is a great persistence in human physical forms, the variability is minimum after the formation of the races, and does not effect the changes of type. [6]

The same fact can be noticed for the external characteristics of man, such as the colour of the skin, the colour and form of the hair, and the colour of the iris. It is solely in the crossings that there can be intermediary formations which have not indefinite heredity, because the segregation of characteristics takes place also in this case.

But the studies and observations on this matter are still incomplete, especially according to the Mendelian theory, and there is need of new and careful observation.

As to the pathological inheritance, there exist facts that confirm it in a general way, but the laws under which this heredity occurs have not been fully verified.

ON THE INCREASE OF STATURE IN CERTAIN EUROPEAN POPULATIONS.

(Abstract.)

By Soren Hansen, M.D.,
Director of the Danish Anthropological Survey, Copenhagen.

The improvement in stature in many European countries during the past 50 years is generally ascribed simply to improved hygienic and economic conditions, but the question is really very intricate. The presence of different racial elements, social selection with its tendency to draw the well-made into towns, and the falling death-rate, etc., complicate the investigations. In all countries there is a great lack of truly comparable data from earlier years. The British Inter-Departmental Committee on Physical Deterioration, for example, though it collected an enormous amount of material, was unsuccessful in its endeavours to solve the main question. Single cases,

e.g., the comparison of factory children with the boys of the York Quaker school (Anthropometric Committee, Brit. Ass. 1883), are certainly of great interest, but how can such cases be taken to represent the average?

Other countries possess a rich source of information in their conscription lists. Thus, in Denmark these lists show an unmistakable increase of 3.7 cm. (1 ½ inch) in the average height of the adult Dane during the past 50-60 years. Similar increases are noted from Norway, Sweden and Holland. This increase suggests that there may have been more or less periodic waves of increase and decrease in height, since, on the one hand, we cannot imagine such an increase [7] continuing indefinitely, and on the other, we know that the men of, say, 1000 years ago were quite as tall as they are at present. What are the agencies alternately improving or impairing the racial qualities? First of all, have we sufficiently exact, numerical information regarding the racial qualities?

A critical examination of all available data is very necessary. For example, the weight of new-born children is stated to have increased in England by 59 and 82 grams during the past 20 years, and in Denmark we can point to an increase of 40 grams in 35 years. But when we consider all the possible sources of error, it must be admitted that these statements, and especially the former, require confirmation. The material is not homogenous. Again, it is stated, that the average height of adult women in France has increased by 3 cm. in the last 80 years—but when we read that the total number of measurements in the last period was only 255, we cannot rely very much upon this statement.

On the whole, it may be said, that we have a few cases of definite increase and a goodly number very doubtful. We really need to have the first of the principal recommendations of the Inter-Departmental Committee on Physical Deterioration carried out in all countries, for, the more we subject the available data to critical scrutiny, the more we see the hopelessness of attaining to any real and fruitful conclusions, unless we have an efficient organisation of capable workers, backed by governmental as well as private support.

THE SO-CALLED LAWS OF INHERITANCE IN MAN.

(Abstract.)

By Professor V. Guiffrida-Ruggeri,
Professor of Anthropology, Naples.

The Mendelian laws find verification in man. Every race, whether a sub-species or a variety, has an hereditary possession of certain characters; a possession which is completely transmitted to the descendants, in whom is preserved the same germ plasm as in the progenitors.

The researches of C. B. and G. Davenport seem to have proved the recessive character of albinism and its obedience to the Mendelian law. Hurst has presented figures which show that the inheritance of colour in the iris of the human eye obeys Mendelian laws. Davenport has established the order of dominance by the form of hair, which also obeys the Mendelian law.

De Quatrefages, many years before the re-affirmation of Mendel's discoveries, wrote:—

"The union of individuals of different races involves a contest between their two natures—a contest of which the theatre is the field where the new being is organised. Now, this contest does not take place *en bloc*, so to speak, as has [8] been generally admitted. Each of the characters of the two parents struggles on its own account against the corresponding character (its antagonist, as has just been said). When the hereditary energy is equal on both sides there necessarily ensues a kind of process of which the consequence is the fusion of the maternal and paternal characters in an intermediate character. If the energies are very unequal the hybrid inherits a character borrowed entirely from one of his parents; but this parent, conqueror on one point, may be conquered upon another. Hence, there results with the hybrid a *juxtaposition* of characters derived from each of the types of which he is the child."

Above all, I have wished to call attention to the so-called laws of dominance, because of their great importance. We may conclude that in the case of man the dominant characters are also the original ones.

THE INHERITANCE OF FECUNDITY.

(Abstract.)

By Raymond Pearl,
Biologist, Maine Agricultural Experiment Station.

The purpose of this paper is to give an account (necessarily abbreviated, and without

presentation of complete evidence) of the results of an investigation into the mode of inheritance of fecundity in the domestic fowl, and to point out some of the possible eugenic bearings of these results.

It is shown that while the continued selection, over a period of years, of highly fecund females failed to bring about any change in average fecundity of the strain used, this character must nevertheless be inherited since pedigree lines have been isolated which uniformly breed true to definite degrees of fecundity.

It is further shown that observed variations in actually realized fecundity (number of eggs laid) do not depend upon anatomical differences in respect to the number of visible oöcytes in the ovary. The differential factor on which the variations in fecundity depend must be primarily physiological.

Fecundity in the fowl is shown to be inherited in strict accord with the following Mendelian plan:—

1. Observed individual variations in fecundity depend essentially upon two separately inherited physiological factors (designated L_1, and L_2).

2. *High* fecundity is manifested only when both of these factors are present together in the same individual.

3. Either of these factors when present alone, whether in homozygous or heterozygous form, causes about the same degree of *low* fecundity to be manifested. [9]

4. One of these factors, namely L_2, is sex-limited or sex-correlated in its inheritance, in such way that in gametogenesis any gamete which bears the female sex-determinant F does not bear L_2.

5. There is a definite and clear-cut segregation of high fecundity from low fecundity, in the manner set forth above.

From the standpoint of eugenics it is pointed out that these results furnish a new conception of the mode of inheritance of fecundity, and may be helpful in suggesting a method of attacking the same problem for man.

ETHNIC PSYCHOLOGY AND THE SCIENCE OF EUGENICS.

(Abstract.)

By Prof. Enrico Morselli,
Director of the Clinic for Mental and Nervous Diseases, Genoa University.

All natural varieties or races of mankind differ, not only by their physical, but also by their mental, characters. There exists, therefore, an "Ethnic Psychology" which, along with "Ethnic Somatology," constitutes the complete Science of Anthropology or the Natural History of Man. This must describe and classify races and populations under a double aspect—physical and psychical.

The psychical characters of races are in part *original*, and in part acquired through *adaptation*. These persist in a race as long as such mesological adaptation lasts; they vary with modifications of the conditions of life, including social activities and inter-racial relations.

In mixed unions, amongst different races, there are always some which are more vigorous, biologically and mentally, more fully developed, which impress their characters upon their descendants. For the vitality and well-being of mixed or metamorphic populations a certain amount of difference amongst the parent races is necessary, but too great a difference is injurious to the offspring.

The offspring of mixed unions present in their psychology a *mixture*, again a *combination* or fusion of the mental characters of the parent races: sometimes certain psychical characters of a race become the *dominant* characters.

All ethnic groupings have their destiny marked out by the grade attained in *the human psycho-physical hierarchy*. Nevertheless, it is necessary that each race or nation, when it knows its contribution to the development of universal civilisation, should contemplate the preservation of its own ethnic type. Differentiation amongst peoples is an indispensable factor in human progress. [10]

The science of eugenics should not look for the realisation of a uniform type of man, but vary its aims and methods according to the natural differentiation of races and nations, taking account of ethnic psychology equally with ethnic somatology.

The humanity of the future will be physically and mentally superior to the existing humanity,

but the *amelioration of the species* ought not to aim at the equality of races and populations. These races and populations ought not to lose their acquisition of particular adaptations to different conditions of existence.

A science of universal or common eugenics should allow a eugenic ethnology to exist, which should indicate and facilitate for each race or nation the defence and propagation of its own *physical type* and its own *mentality*. The most vigorous and dominant races will always be those which know how to create and preserve in sexual unions their characteristics of structure and culture.

THE INHERITANCE OF EPILEPSY.

(Abstract.)

By David Fairchild Weeks, M.D.,
Medical Superintendent and Executive Officer, the New Jersey State Village for Epileptics at Skillman, U.S.A.

In this paper the writer has endeavoured to learn what laws, if any, epilepsy follows in its return to successive generations, and the relation it bears to alcoholism, migraine, paralysis, and other symptoms of lack of neural strength.

The data used in the study was analysed according to the Mendelian method which assumes that the inheritance of any character is not from the parents, grandparents, etc., but from the germ plasm out of which every fraternity and its parents and other relatives have arisen. If the soma possesses the trait of the recessive to normality sort, it lacks in its germ plasm the determiner upon which the normal development depends, and this condition is called nulliplex. If the soma possesses the trait of the dominant to normality sort, the determiner was derived from both parents and is double in the germ plasm, or normal, all of the germ cells have the determiner; or else it came from one parent only, is single in the germ plasm, or simplex, and half of the germ cells have and half lack the determiner. [11]

The method of obtaining the data was by means of field workers, who interviewed in their homes the parents, relatives and all others interested in the epileptic patient. These visits have established a friendly feeling toward and an intelligent understanding of the Institution and its work.

The study is based on the data derived from 397 histories, covering 440 matings.

The matings are classified under the six possible types, of nulliplex × nulliplex, nulliplex × simplex, nulliplex × normal, simplex × simplex, simplex × normal, and normal × normal.

Under the first type all those matings where both parents were epileptic, one was epileptic and the other feeble-minded, or both were feeble-minded, are classified. According to Mendel's Law, all of the children should be nulliplex. The data showed all of the children defective.

Under the type nulliplex × simplex, all matings where one parent was epileptic or feeble-minded and the other "tainted," that is, alcoholic, neurotic, migrainous, or showed some mental weakness, are classified. From this type of mating, 50% of the offspring are expected to be nulliplex and 50% simplex. From the matings where one parent was epileptic or feeble-minded and the other alcoholic, there were 61% mentally deficient or nulliplex, the remainder simplex. The figures for the offspring from the other matings showed 47% nulliplex, and 53% simplex.

For the third type, nulliplex by normal, all those matings where one parent was epileptic or feeble-minded and the other reported as mentally normal are classified. From this type of mating, the expectations are that all of the children would be simplex. A study of the ancestors of the normal parents showed these parents simplex rather than normal. The analysis of the offspring showed at least 43% nulliplex, which is a close fitting to the type of mating nulliplex × simplex.

The fourth type of mating is simplex × simplex. Here, all matings where both of the parents were "tainted" are classified. The expectation is that 25% of the offspring would be nulliplex, in reality 35% were found to be mentally deficient.

Simplex × normal is the fifth type of mating considered. The matings where one parent was tainted and the other supposedly normal, are classified here. From a study of their ancestors these normal parents appeared to be simplex, and the classification of the offspring showed more than 25% nulliplex, which is the expectation from simplex × simplex mating.

The sixth type is normal × normal, and the matings where both parents were reported normal is studied under this heading. Here, as before, a study of the ancestors of these normal parents indicates that they are simplex, and not normal. The classification of the children showed a close fitting to the expectation from a simplex × simplex mating.

A special study of the matings where one or both of the parents was migrainous or alcoholic, [12]

shows a close relationship between these conditions and epilepsy.

The following conclusions are drawn from the study.

The common types of epileptics lack some element necessary for complete mental development. This is also true of the feeble-minded.

Two epileptic parents produce only defectives. When both parents are either epileptic or feeble-minded their offspring are also mentally defective.

Epilepsy tends in successive generations to form a larger part of the population.

The normal parents of epileptics are not normal but simplex, and have descended from tainted ancestors.

Alcohol may be a cause of defect in that more children of alcoholic parents are defective than where alcoholism is not a factor.

Neurotic and other tainted conditions are closely allied with epilepsy.

In the light of present knowledge, epilepsy, considered by itself, is not a Mendelian factor, but epilepsy and feeble-mindedness are Mendelian factors of the recessive type.

Tainted individuals, as neurotics, alcoholics, criminals, sex offenders, etc., are simplex and normals or simplex and normal in character.

THE INFLUENCE OF THE AGE OF PARENTS ON THE PSYCHO-PHYSICAL CHARACTERS OF THE OFFSPRING.

(Abstract.)

By Antonio Marro,
Director of the Lunatic Asylum, Turin.

The natural law of heredity holds good whether for the physical characteristics or for those which are biological and moral.

The apparent anomalies which children present in not reproducing the qualities of the parents, and the unlikeness frequently noted among the children of the same family, only serve to reveal the presence of the particular conditions of the parents at the time of begetting which has influenced the offspring.

We have a proof of this law in the anomalies presented by the children of parents who, at the time of begetting, were themselves in anomalous conditions by reason of intoxication or disease.

Among the conditions of parents which are capable of influencing the characteristics of children must be included the changes which their organism undergoes by reason of advancing age.

I propose to study the effects of age on the physical and moral characters of the children. My researches have extended to numerous criminals and insane persons, as well as to scholars of the [13]
public schools and other normal persons affected or not with special diseases.

Of my studies on criminals, the result is: that the children of young parents are found in large numbers guilty of offences against property; and this is natural. The first impulse to that is not due to wickedness, which impels them to inflict harm on others, but to love of pleasure, of revel, of idleness—all features of youth, during which period the passions are very active, and no restraint present with which to repress and subjugate them.

Swindlers alone are exceptions to this rule, but swindling is a crime of riper years, according to the dictum of Quetelet.

Among crimes of personal violence, I have found a numerical superiority in the children of aged parents. Assassins, homicides, those who show the completest absence of sentiments of affection and often delusions of persecution more or less pronounced, gave a proportion of children of aged parents far greater than that furnished by all the other categories of delinquents; the proportion is as high for fathers as for mothers of advanced age.

Here, too, we note a certain correlation between the state of discontent, of suspicion, of frigid egoism, which the decline of physical energy tends to arouse in the old, and the absence of affectionate sentiment and a tendency to delusions of persecution which are usual in murderers. Among the insane, moral idiocy in particular, and the degenerative forms in general, appeared more frequently in children of aged parents.

As to schoolboys, I have noticed that the minimum of good conduct and the maximum of better developed intelligence coincides with the possession of youth by both parents.

The age of complete development corresponds to a maximum of good conduct and a minimum of bad conduct, and retains a large proportion of intelligent children.

In the period of decline of both parents, good conduct of children is observed in a smaller proportion than in the preceding period, and high intelligence in a very small proportion.

Among biological qualities I have made observations on longevity; among persons of 70 and 80 whom I have examined there is a large proportion of parents who themselves enjoyed remarkably long lives, which proves the transmissibility from father to son of powers of resistance against the stresses of life.

Among physical qualities I have made note of the fact that from alcoholic or aged parents were descended children in whom degenerative physical characteristics were most frequently apparent, recalling some features of an inferior human type, such as exaggeration of the frontal sinuses, the torus occipitalis, ears with the Darwinian tubercles prominent, the forehead receding, etc. At the same time the ascendants of those who presented typical and anomalous characters, due to morbid influences of various kinds and following on faulty development of the [14]
fœtus, such as cretinism, congenital goître, nasal deflections, strabismus, plagio-cephaly, hydrocephaly, dental malformation, etc., showed a large number of alcoholics and epileptics.

The explanation of the pernicious consequences to the psycho-physical characters of the children of parents too young or too advanced in age does not present much difficulty.

At the younger period the organism is still in process of formation; the incomplete development of the skeleton, as of all the other organs, continually absorbs a mass of plastic materials necessary to the formation of offspring. So we may consider that the faults of children born of too young parents are due to an incomplete development because of the insufficiency of plastic material.

We must, on the other hand, seek in the conditions which accompany old age for the reason why it has a disastrous influence on the vitality of the germinal elements of the parents and predisposes the descendants to various forms of physical and moral degeneracy.

During this period we have in the tissues, instead of a development and renewal of protoplasm, the tendency to an accumulation of fat; and in the whole organism, chiefly in the tissues of the arterial system, we find the tendency to a deposit in their structure of an amorphous substance which converts the supple elastic canals into rigid tubes; and from this a general slowing up of the organic functions (circulation, oxidation, secretion) results; the blood, not reaching the degree of elaboration which it possessed before, acquires a greater acidity, and cannot by the ordinary excretory channels so quickly get rid of the catabolic products with which it is charged.

By reason of these conditions the organism of older people undergoes a sort of slow and gradual intoxication, which, at the same time as it shows itself in the individual by the gradual languishing of all his functions, influences in a disastrous manner the germs which develop within him, and predisposes them to become beings condemned to degeneracy.

Consequently this cause of degeneracy enters the general category of intoxications.

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[15]

GENETICS AND EUGENICS.

(Abstract.)

By R. C. Punnett,
Professor of Biology, Cambridge.

To the student of genetics, man, like any other animal, is material for working out the manner in which characters, whether physical or mental, are transmitted from one generation to the next. Viewed in this way he must be regarded as unpromising, not only from the small size of his families, the time consumed in their production, and the long period of immaturity, but also because full experimental control is here out of the question. For these reasons man is of interest to the student of genetics, chiefly in so far as he presents problems in heredity which are rarely to be found in other species, and can only be studied at present in man himself. The aim of the Eugenist, on the other hand, is to control human mating in order to obtain the largest proportion of individuals he considers best fitted to the form of society which he affects. It is evident that to do this effectually he must have precise knowledge of the manner in which transmission of characters occurs, and more especially of those with which he particularly wishes to deal. Precise knowledge is at present available in man for relatively few characters; and those characters, such as eye-colour, and certain somewhat rare deformities, are not the kind on which the Eugenist lays great stress. The one instance of eugenic importance that could be brought under immediate control is that of feeble-mindedness. Speaking generally, the available evidence suggests that it is a case of simple Mendelian inheritance. Occasional exceptions occur, but there is every reason to expect that a policy of strict segregation would rapidly bring about the elimination of this

character.

There is reason to suppose that many human qualities are more complicated in their transmission, and it is probable that certain phenomena now being studied in plants and animals will throw definite light upon man. Though characters are frequently transmitted on the Mendelian scheme quite independently of one another, there are cases known in which they are linked up more or less completely in the germ cells with the determinant of a particular sex. Sex-limited inheritance of this nature has been carefully worked out in particular cases in Lepidoptera and poultry. As yet there is much to be learnt in this direction, and further progress may be expected to lead eventually to a precise knowledge of the mode of transmission of many human defects, such as colour-blindness and hæmophilia. It is not unlikely that a similar mode of transmission will be found to hold good for many human characters usually classed as normal.

Another set of phenomena which will probably be found of importance in the heredity of man [16] are those included under the terms "coupling" and "repulsion." Characters, each exhibiting simple Mendelian segregation, may become linked together more or less completely in the process of heredity, or the reverse may occur. Our knowledge of these phenomena is at present almost completely confined to cases in plants, but evidence is beginning to be obtained for their occurrence in animals. It is not unlikely that they will be found to play a considerable part in human heredity. For one of the most noticeable things about man is the frequency with which children resemble one or other parent to the seemingly almost complete exclusion of the other. In view of the mongrelisation of the human race, the frequency of these cases is very remarkable, and can hardly fail to suggest that some sort of coupling between characters plays a large part in human heredity.

Except in very few cases, our knowledge of heredity in man is at present far too slight and too uncertain to base legislation upon. On the other hand, experience derived from plants and animals has shewn that problems of considerable complexity can be unravelled by the experimental method, and the characters concerned brought under control. Though the direct method is hardly feasible in man, much may yet be learnt by collecting accurate pedigrees and comparing them with standard cases worked out in other animals. But it must be clearly recognised that the collection of such pedigrees is an arduous undertaking demanding high critical ability, and only to be carried out satisfactorily by those who have been trained in and are alive to the trend of genetic research.

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Section II.

Practical Eugenics.

GENERAL CONSIDERATIONS UPON "EDUCATION BEFORE PROCREATION."

(Abstract.)

By Adolphe Pinard,
Professor at the Faculty; Member of the Academy of Medicine of Paris.

Sir Francis Galton has entitled Eugenics the new science having for its object the study of the causes subject to social control which can improve or impair the racial qualities of future generations, whether physical or mental.

Eugenics, thus defined, is nothing else but "Education before Procreation," which has been studied in France for a number of years, and which constitutes the first part of child-culture, "a science having for its object the search for information relative to the reproduction, preservation, and improvement of the human species"([1]).

[1] v. De la Puériculture in Revue Scientifique, 1897.

The Congress ought then to have for its object to work for the investigation of the conditions necessary to secure a favourable procreation. Now, it appears that the word "Eugenics," from the etymological point of view, does not characterise either explicitly or sufficiently the proposed object, while the word "Eugénique," of [Greek: gennaô], at once recalls to the mind the idea of a favourable procreation([2]).

[2] Besides, the word "Eugenics" recalls in France a chemical term: eugenic-acid.

It is part of the duty of our first principal sitting to lay down a rule upon this point.

Certainly, biological, sociological, and historical researches, laws and social customs regarded in their relations with the science of Eugenics, are necessary and will undoubtedly result in extremely interesting data, but from now it is above all things urgent to establish and proclaim eugenic principles.

Researches relating to physiological heredity and pathological heredity ought to be pursued without interruption, but it is necessary to make known as soon as possible to the masses of the [18] people the individual conditions, fully understood, which alone permit a favourable and healthy procreation. In a word, it is necessary, by every means and as soon as possible, to organise a great movement in order to show to the greatest number of human beings the absolute necessity for a conscientious, *i.e.*, an enlightened procreation. We must bravely approach the civilising of *the reproductive instinct*, which alone has remained in a barbarous state amongst all the so-called civilised nations from the earliest times.

Then only, when societies have fulfilled this duty, will they have the right to investigate what they ought and can effect against those for whom future offspring would be recognised as fatally disastrous.

Finally, it is fully understood that researches relating to selection in the human species must be pursued in a parallel manner, as is now done with such fruitful results for animals and vegetables in Genetics, and in throwing light upon the constantly increasing conquests of this other science.

PRACTICAL ORGANIZATION OF EUGENIC ACTION.

(Abstract.)

By Dr. Louis Querton,
Professor at the University of Brussels.

Now that many studies on the physiology and hygiene of reproduction of man have been made, and many investigations on degeneration have been conducted, we may face the problem of the betterment of the race, from a practical standpoint.

If the eugenic action cannot yet strive directly against hereditary transmission of anomalies, it can fight successfully against the causes of degeneration which act during the development of the individual.

Physical and social environment influences these causes, which, on account of their growing complexity, create more and more obstacles to the normal evolution of the individual, while at the same time they force him to acquire greater and more varied aptitudes.

To thwart the prejudicial action of the environment on the development of the individual, the systematic organization of this development seems to be of first importance.

The control of the development of the children, at the different phases of their evolution, is [19] strictly necessary to assure the education of the individual and to check the degeneration of the race.

The control is already established for certain classes of children, and during limited periods of their development. Nurslings, school children, and labourers can already, sometimes compulsorily, be submitted to control.

But the insufficiency of the actual organization is very evident, and the results are, from the eugenic standpoint, unsatisfactory.

In order to be really effective and to contribute to the improvement of the individual and to the betterment of the race, the control of the development should, as far as possible, be exerted over all children, and it should last during the whole period of their evolution. This control should be compulsory, as well as education; it should be exercised by an institution, the frequentation of which, as well as that of school, might be forced upon all children whose development is not submitted to an effective control in their homes. Private initiative should create such institutions everywhere, and thus prepare legislative interference.

These methodically organized eugenic institutions should, in the future, be the development of the administrative institutions, which actually establish the civil state of individuals. They would tend to facilitate the education of individuals and public bodies; at the same time they would assure the strict application of the laws concerning the protection and education of childhood.

They would collect the documents necessary to the scientific knowledge of the facts of heredity, and would supply precise information concerning the effective work of different social institutions on transformation of the race.

MARRIAGE LAWS AND CUSTOMS.

(Abstract.)

By C. B. Davenport,
Director, Eugenics Record Office, U.S.A.

Of the various laws limiting freedom of marriage three are of biological import. First, the limitation of relationship between the mates; second, the limitations in mental capacity of the mates; and third, limitations of race.

For the first there is a biological justification in so far as cousin marriages are apt to bring in from both sides of the house the same defect. For the second the justification is partial; but there is equal reason for forbidding the marriage of normal persons both of whom have mentally [20]
defective parents or other close relatives. The denial of marriage between races has this justification, that most other races have not, through selection, attained the social status of the Caucasian. In such cases the socially inadequate should be sterilized or segregated in other races as well as in the Caucasian.

EUGENIC SELECTION AND THE ORIGIN OF DEFECTS.

(Abstract.)

By Frédéric Houssay,
Professor of Science, University of Paris.

Eugenics, which is a social application of biological science, cannot yet be judged by its results; it must be judged by its tendencies. To determine these, we must adjust them to principles generally admitted.

And inasmuch as it advocates practical rules and seeks to check the propagation of the unfit, by isolation or sterilization (voluntary or enforced), it is an artificial selection.

Its justification lies in the fact that, without intervention, the descendants of defectives or degenerates would, in a few generations, eliminate themselves by early death of children or by natural sterility. This would produce a natural selection which Eugenics simply proposes to anticipate by social economy.

It seems that, by applying Darwinian principles, the group of defectives, considered at a given moment, could be rapidly extinguished. But this group is continually reinforced by fresh degeneration of healthy stocks which become tainted.

Hence the need to keep our eye on the re-formation of the group as well as its elimination, and to keep in touch with Lamarckian principles. The study of the origin and hereditary conservation of defects points already as essential factors, to alcoholism, syphilis, and more generally every chronic ailment and diathesis, among which gout must be put in a leading position. Everything which will tend to restrain the action of these factors is of capital importance from our present point of view, whether it occurs in the ranks of rich or poor.

The questions, thus, which Eugenics seeks to answer would be on this view reduced to questions of hygiene and morals.

So that the different biological principles, which sometimes seem in mutual opposition, would become convergent, and would find in Eugenics a ready reconciliation and a field of useful co-operation.

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[21]

PRELIMINARY REPORT TO THE FIRST INTERNATIONAL EUGENICS CONGRESS,

Of the Committee of the Eugenics Section of the American Breeders' Association to Study and Report on the Best Practical Means for Cutting Off the Defective Germ Plasm in the Human Population.

(Abstract.)

By Bleecker Van Wagenen, *Chairman*.

1. Brief history of the American Breeders' Association, the Eugenics Section and the Committee on Elimination of Defective Germ Plasm.

2. Concise statement of the problem before the Committee and reasons for the investigation.

3. History of legislation in the United States authorising or requiring the sterilization of certain classes of criminals, defectives and degenerates who are under the control of the State in institutions. Digest of the laws now in force. (This may be given as a lantern slide with greater effect.)

Legal views concerning the constitutionality of these laws.

4. Investigations of vasectomy in Indiana, Illinois, Massachusetts and elsewhere, with detailed reports of some typical cases. (With lantern slides.)

5. Reports of sterilization of females, both of normal and abnormal mentality, with a number of typical cases showing after-effects. (With lantern slides.)

6. Some observations in thremmatology suggesting important questions concerning the practical effectiveness of sterilization as a eugenic measure.

7. Technical description of several kinds of sterilizing operations as now performed. Vasectomy, ovariotomy and salpingectomy (with and without complete excision), castration.

8. Reports of several cases of persons, male and female, who having been completely sterilized for a time, recovered the power of procreation and actually did procreate thereafter.

9. State of public opinion regarding sterilization in the United States at the present time. Letters from Governors of States, views of Social Workers and Institution people. Conflicting views of Roman Catholics (as such). Digest of arguments set forth in a long controversy carried on in the American Ecclesiastical Review, chiefly in Latin.

10. Brief report of other data collected by the Committee and programme for future work, with a call for co-operation in securing further data pertinent to this inquiry.

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[22]

EUGENICS AND THE NEW SOCIAL CONSCIOUSNESS.

(Abstract.)

By Samuel George Smith.

The new social consciousness is indicated; first, by the larger powers and duties assumed by the State: second, by the new sense of social solidarity affecting persons and groups of persons within the State. The exclusion from parenthood of such wards of the State as the feeble-minded, the insane, and the pauper has gone beyond debate; and for all that are legally excluded from parenthood, custodial care is required. There is need to develop a new ethical sense of the individual in regard to his own relations to the social group. We have not yet sufficient facts to establish a definite relation between physical fitness and social efficiency. This is the place for caution.

Questions of maternity among the poor: (*a*) Hard labour must be forbidden to the expectant mother; (*b*) she must have nourishing food; (*c*) surroundings must be wholesome. The economic problem is solved in the increased vitality and consequent earning power of the coming generation.

Problem of the parenthood of the better classes: just as important and more difficult. The question is not only vital and economic; it is also ethical.

The ignorance of parents and the defects of children. The State has invaded the home, and has set standards, both physical and moral, for the family. It is the duty of the State to secure the proper physical environment for the home. It is a municipal problem. It is a problem of public health. The whole movement looks to the triumph of a vital democracy, which is more important than either political or industrial democracy.

Relations of alcoholism to neurasthenia, of tuberculosis to feeble-mindedness, of bad social and labour conditions to both, indicate cross sections in the problem. Vices of the rich in most countries are greater than the vices of the poor. A vital democracy cannot be based upon physical tests and material comfort. Its deepest foundations are psychical and ethical.

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[23]

PRACTICABLE EUGENICS IN EDUCATION.

(Abstract.)

By Dr. F. C. S. Schiller.

The danger to mankind arising from the preservation of the unfit under social conditions. The self-destructiveness of civilization. Its superiority dependent on the transmission of accumulated knowledge by education. The danger of failure in educational systems. Is the education of the rich necessarily a failure? The middle classes as providers of ability to man the professions; but the price they have to pay at present is too often racial extinction. The draining of ability from the lower classes.

The existing educational system and its potential value for eugenics. Its unintellectual character. The liberal endowment of a "liberal education." Commercialism and the scholarship system. The athletic system, the play instincts and moral training. Both systems are Darwinian and appeal to British character.

Suggested improvements: (1) in the athletic system; "fitness," not a merely physical ideal; (2) in the scholarship system; "liberal education" to be conceived as intrinsically useful, and not merely a game with intrinsically useless subjects.

Should scholarships be restricted to the needy? The educational dangers of this policy. The eugenical value of the existing system.

The possibility of infusing eugenical spirit into athletics. The appeal of eugenics to the upper classes. A real versus a sham nobility. The eugenical ideal essentially a matter of sentiment and not necessarily anti-democratic.

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[24]

Section III.

Sociology and Eugenics.

THE PSYCHO-PHYSICAL ELITE AND THE ECONOMIC ELITE.

(Abstract.)

By Professor Achille Loria,
University of Turin.

Artificial selection could be perfectly applied to the human species, in which case marriages would be arranged between persons better endowed, physically and mentally, and the worse endowed would be excluded from marriage. But this selection encounters the gravest practical difficulties; because, if it is relatively easy to estimate the physical qualities of man, nothing on the other hand is harder than to estimate his mental qualities. A dynamometer of intelligence does not exist, and Galton's method of observing the points of merit of University graduates is very insufficient and fallible.

In face of these difficulties there naturally arises the idea of inferring the psycho-physical aptitudes of individuals from their social and economic position, or from their income, which is easily measured. In accord with this idea, it would be a question of acting so that marriages would be effected exclusively and predominantly amongst individuals provided with superior incomes, and to prevent, as far as possible, marriages between persons of inferior incomes, or of no income at all.

But all this would be plausible if there should be a real analogy between the economic élite, and the psycho-physical élite, or if the former were really a product of the latter. Now, this is precisely what I deny. The *economic élite* is not in the least the product of the possession of superior qualities, but is simply the result of a blind struggle between incomes, which carries to the top those who, at the start, possess a larger income through causes which may be absolutely independent of the possession of superior endowments. (See my *Sintesi economica*—Paris, Giard et Briard, 1911.) Hence, nothing makes it impossible that the wealthier people should be precisely the worst endowed, physically and mentally, and this as a matter of fact happens in innumerable cases.

Besides, we have an indirect proof of this in the very results of selective processes as, until now, they are practised. And, in fact, conjugal selection to-day takes place precisely amongst individuals of the same class, or belonging to the same standard of income, so that persons of the

[25]

upper classes always marry exclusively amongst each other. So then these marriages, which, according to the theory, ought to give more splendid results, give, on the contrary, more wretched results. Galton's same law of "return to the mean," or the fact that the descendants of persons of high class sometimes have inferior endowments as compared with the average of the race, could not be fulfilled if persons of the upper classes who marry with each other were really select persons, physically and mentally.

There would also be in this case a falling off from the super-normal qualities of an exceptionally gifted parent, but in that case the characters of the children would always be superior to those of the descendants of the lower classes. If this does not happen, if the children of the upper classes show qualities inferior to those of the average of children of the lower classes, this proves conclusively that married people of the superior classes were not in the least endowed with specially high aptitudes, but, on the contrary, presented the opposite characteristics. Thus, the same law of Galton, properly interpreted, shows the absolute independence of largeness of income and excellence of individual qualities, hence the absurdity and danger of Eugenics upon an economic foundation, such as many desire.

The researches of Fahlbeck upon the Swedish nobility, which show the rapid extinction of the upper classes who practise *Economic Eugenics*, is a further proof of the absence of any link between economic superiority and psycho-physical superiority; since if the wealthier people, who usually intermarry, were really the better endowed, their descendants would never show those phenomena of extinction which betray a leaven of inner degeneration.

I conclude that Economic Eugenics is already practised to-day upon a large scale, and hence it is already possible to form an accurate judgment upon its results—which are those of return to the mean—degeneration and extinction of race. Now, these same results show that the economically superior classes are not at all the best endowed, and often even degenerate, and that, therefore, the only method calculated to effect a conjugal selection which would be socially useful is not to unite in marriage the richer people, but individuals really possessing superior qualities, and to exclude from marriage those who do not possess them.

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[26]

THE CAUSE OF THE INFERIORITY OF PHYSICAL AND MENTAL CHARACTERS IN THE LOWER SOCIAL CLASSES.

(Abstract.)

By Professor Alfredo Niceforo,
Of the University of Naples.

The author has compared the physical, demographic, and mental characters of the upper and leisured classes with the same characters in individuals of the inferior and poor classes. He has made use of several methods: (1) A comparison between the well-to-do and the poor children in schools; (2) a comparison between individuals belonging to different professions; (3) a comparison between the rich and the poor quarters of the same city.

He has also studied 4,000 children of the schools of Lausanne; Italian peasants; conscripts of different countries, classified according to their occupation; and the rich and the poor quarters of Lausanne, Paris, etc.

He has found that individuals of the lower classes show a smaller development of stature, of cranial capacity, of sensibility, of resistance to mental fatigue, a delay in the period when puberty makes its appearance, a slackening in growth, a very large number of anomalies, etc.

The causes of these differences ascertained in comparing the two groups are of the *mesological* and *individual order*.

Of the *mesological* order because the conditions of life where men of the lower classes are forced to live constitute one of the causes of the deterioration of their physical and mental characters.

Of the *individual* order because, thanks to biological variation, every man is born different from all other men, and men who are born with superior physical and mental characters tend to rise in the superior classes, while men who are born with inferior physical and mental characters tend to fall in the most wretched classes.

However, in studying the catalogues of measurements and observations, the author has found that in the mass of men belonging to the superior classes one finds a small number of men with inferior qualities, while in the mass of men forming the inferior classes one finds a certain number of men presenting superior characters.

It is between these two *exceptional* categories that social exchanges should be made, allowing the best and most capable of the lower stratum to ascend, and compelling the unadapted who are found above to fall to the lower stratum.

THE FERTILITY OF MARRIAGES ACCORDING TO PROFESSION AND SOCIAL POSITION.

(Abstract.)

By M. Lucien March,
Directeur de la Statistique Générale de la France.

Statistics of families furnish, perhaps, the most appropriate data for the examination of the factors which govern the productiveness of marriages or their sterility.

Statistics concerning the children born in the eleven and a half million French families, classed according to occupation, have been prepared in France for the first time as a result of the census of 1906. These statistics give information as to the number of children per family, either alive on the day of the census or previously deceased, in each occupation, for all the families in the whole country taken together, and for the different provinces. Further, a special investigation of the 200,000 families of employees and workmen in the public services has furnished more circumstantial details, which have enabled the number of children and number of deaths of children in a family to be brought into relation with the income of the head.

The results obtained by the method described above are the subject of this report. The effects of occupation, social position and income are analysed by means of co-efficients expressing the productiveness of marriages, after eliminating the influence of such factors as duration of marriage, age, and habitat, all of which may obviously affect the productiveness of a marriage.

These results confirm what has been learnt from previous researches of the fertility of different social classes, but they go further in that they show that the difference is not exclusively dependent on income.

In general there are more children per family in the families of workmen than in the families of employers, and the latter contain more than those of employees other than workmen. Further, one finds industries in which the number of children in the employers' families is larger than in the families of workmen in other industries. Thus, differences are introduced by the occupation. Industries employing many hands seem the more favourable to the production of large families, both among workmen and among employers. Agriculture, in which a large number of persons are engaged in France, does not seem to conduce to fertility. Fishermen and sailors in the merchant service, on the other hand, appear to form the class in which fertility is the most considerable.

The importance of the occupational factor is such that we could place its influence on the same plane as that of "concentration" of population, with which it is in close relation, since [28] persons following certain classes of occupation, as, for instance, the members of the liberal professions, and clerks and other salaried employees are most numerous in towns.

It does not appear that in France casual and unskilled labourers, persons in the receipt of Poor Law relief, etc., are specially prolific. There is not thus in reality too much risk of seeing the renewal of the population carried out in a dangerous manner by its least valuable section. However, even among the working classes, the most highly paid occupations are not those among which one finds the greatest number of children.

The economic, social, or moral burden of children is a factor bound up in a complex manner, not only with the individual conditions of existence, but also with the transformations of society, progress in manners and customs, and the conception which one forms of life.

It is this burden which must be allieviated where allieviation would be most effective and produce the best results, in order to put a stop to a movement which may be dangerous to civilisation.

EUGENICS AND MILITARISM.

(Abstract.)

By Vernon L. Kellogg.
(*Professor in Stanford University, California.*)

The claim that war and military service have a directly deteriorating influence through military selection on a population much given to militarism, has been clearly stated by von Liebig, Karl Marx, Herbert Spencer, Tschouriloff, Otto Seeck, David Starr Jordan, and others, not to mention the ever-anticipating Greeks. Military selection may be conceived to work disastrously on a population both through the actual killing during war by wounds and disease of the sturdy

young men selected by conscription or recruiting, and also by the removal from the reproducing part of the population of much larger numbers of these selected young men both in war and peace times. Another phase of the racial danger from military service is the possibility of the contraction of persistent and heritable disease which may be carried back from camp and garrison with the return of the soldiers to the population at home.

As likely as seem all these and certain other anti-eugenic influences arising from military selection, the substantiation of their actual results on a basis of observed facts is necessary to give them real standing as eugenic arguments against militarism.

The writer is engaged at present in an attempt to find and expose certain actual results of [29] military service and war that have direct relation to racial modification. His paper presents some pertinent facts and figures already gained. These facts are examined in the light of the criticisms of such men as Bischoff and Livi, who have recognized the weaknesses in military and hygienic statistics, and in the light of other opportunities for error both in the recording and the interpretation of the facts, which have suggested themselves to him. Also there has to be considered the possible reality of eugenic advantages from military selection. Seeck and Ammon believe they have discovered some.

The writer, holding in mind both the dangers of error and the possibility of eugenic advantage, believes himself nevertheless able to present certain definite facts showing considerable direct eugenic disadvantage in certain types of militarism.

EUGENICS IN PARTY ORGANIZATION.

(Abstract.)

By Roberto Michels,
University of Turin, Italy.

An oligarchy is invariably formed in all political parties for reasons based partly on individual psychology, partly on crowd psychology, and partly on the social necessity of party organisation. Under the first head is grouped the individual's consciousness of his own importance, which with opportunity develops into the natural human lust for power, and, further, such individual qualities as native tact, editorial ability, and so on. Crowd psychology is characterised chiefly by the incompetence of the masses, their dependence upon traditional methods of party government, and their feeling of gratitude to leaders who have suffered for the cause. Finally, the necessity for party organisations grows with every increase of numbers and extension of functions. It is physically impossible for large party groups to govern themselves directly. All parties live in a state of perpetual warfare with opposing parties, and, if they are revolutionary in character, with the social order itself. Tactical considerations, therefore, and, above all, the necessity of maintaining a condition of military preparedness, strengthen the hands of the controlling clique within the party and render every day more impossible genuine democracy.

The selective or eugenic value of party organization is that it allows men gifted with certain qualities to rise above their fellows into positions of superiority, which, for the considerations set forth above, are more or less permanent. This value is of the greater importance because the [30] opportunities for able and ambitious workmen to rise by the economic ladder to the rank of employers are rapidly disappearing, at any rate, in old countries.

The qualities necessary for a successful party leader are discussed. Briefly stated, they consist of oratorical ability, which is partly a psychical and partly a physiological and anatomical character; energy of will; superiority of intellect and knowledge; a depth of conviction often bordering on fanaticism and self-confidence, pushed even to the point of self-conceit. Also in many countries, as for instance Italy, physical beauty is important in helping a man to rise, while in rarer cases goodness of heart and disinterestedness influence the crowd by reawakening religious sentiments.

We have seen that some elements of the crowd are seized by the selecting-machine of the party organisation that raises them above their companions, increasing automatically the social distance between them and their followers. To put this automatical selecting-machine into action, certain individuals appear, possessing special physical and intellectual gifts that distinguish them spontaneously from the mass of the party.

THE INFLUENCE OF RACE ON HISTORY.

(Abstract.)

By W. C. D. and C. D. Whetham.

The history of Europe presents a long series of nations successively rising and falling in the scale of prosperity and influence. Such persistent alternations suggest a common cause underlying the phenomena. All history is the record of change. The outward change as recorded by the chronicler has probably its counterpart in unnoticed variations of the internal biological structure of the nation.

Most nations are composite in character. They contain two or more racial stocks, fulfilling different functions in the national life. It is probable that the proportion in which these stocks are present is not always constant. The variation in proportion is possibly the agent effecting the internal change in structure, which becomes manifest outwardly in the rise or decline of the nation.

The physical characters of the population of Europe during historic times indicate three chief races: (1) the Mediterranean, (2) the Alpine, (3) the Northern. The individuals of these races possess also distinct mental and intellectual attributes, and the history of Europe is fundamentally the story of the interaction of the three races.

It is suggested that the supreme power of Greece and Rome, each in its own direction, was due to the attainment of a fortunate balance between the social and political functions of the [31] constituents of the nation, the directing power being supplied chiefly by the invaders of northern race, who formed the dominant class among the southern indigenous Mediterranean population. In each case, the northern elements grew gradually less, through such agencies as losses in war, the selective action of a differential birth rate, and by racial merging into the more numerous southern stock.

The outburst of artistic genius and intellectual pre-eminence which marked the Renaissance in North Italy may perhaps be due to a similar racial composition, the northern elements being supplied by the descendants of the barbarian invaders of the later Roman Empire.

Great Britain has also similar racial elements. The Mediterranean race, spreading up the shores of the Atlantic, enters largely into the composition of the people of the south-west. The northern element, immigrant from the shores of the Baltic and North Sea, is strongest in the east and north.

We know that there are now at work two influences affecting the average racial character of the English nation; (1) the increase in the urban population at the expense of the rural, (2) the voluntary restriction of the birth rate which affects certain sections of all classes more than others. It is probable that both these changes tend to favour selectively the southern racial elements at the expense of the northern. Eventually, the present structure of society may become unstable in consequence of this racial alteration, and the necessary readjustment, in its turn, will contribute a chapter to history.

SOME INTER-RELATIONS BETWEEN EUGENICS AND HISTORICAL RESEARCH.

(Abstract.)

By Frederick Adams Woods, M.D.,
Harvard Medical School.

The relative influence of heredity and environment has long been a subject for debate, but, for the most part, such debates have not been profitable. It is true that heredity cannot be separated from environment if only one individual be considered; but as soon as we inquire into the causes of the differences between man and man, it is perfectly possible to gain real light on this subject, so important to the advocates of eugenics. Everything must be made a problem of differences. The mathematical measurements of resemblances between relatives close of kin will sometimes serve. At other times, the correlation co-efficient is of no avail, and only an intensive study of detailed pedigrees will bring out such differences as cannot be due to the action of surroundings.

History and genealogy both speak unmistakably for heredity. Men of genius have as many [32] eminent relationships as the expectations of heredity demand. The same is true among the highest aristocratic classes, and is equally true under democratic government, as is proved by a study of the family history of those Americans whose names are in the Hall of Fame. History shows that about half of the early monarchs were not cruel or were not licentious. Alternative heredity can well account for that. Virtuous types have only slightly increased in numerical proportion. Environment cannot be very effective; but there are biological factors of a more hidden nature which are silently making for progress. Mental qualities are correlated with moral; and in the European dynasties the survivors have been generally the descendants of the morally superior.

Physical differences can also be demonstrated, coming in the course of generations. A study of the portraits of royal, noble, and other historical personages shows that the bony framework of the face, especially about the nose and eyes, has changed rapidly since the beginning of the sixteenth century.

In explaining the rise and fall of nations, gametic and personal causes can be measured and marked. All the evidence of history points to the power and importance of a very few great personalities—they themselves the product of inborn forces. These have been the chief causes of political and economic differences, but non-gametic (environmental) causation can be occasionally detected, and separated out; as, for instance, the modern scientific productivity in Germany and the proportionate intellectual activity among women in America. It is estimated that there are four hundred thousand books on history. These form an almost unworked mine of information, easily available to every student of eugenics. It is high time that the human record, so ancient in its beginnings, should be used to contribute to that most modern of sciences, the improvement of the human breed.

DEMOGRAPHICAL CONTRIBUTIONS TO THE PROBLEMS OF EUGENICS.

(Abstract.)

By Dr. Corrado Gini,
Professor of Statistics in the Royal University of Cagliari, Italy.

Tables of mortality relating to human beings with classification as to age, when compared with similar statistics relating to the equine species, show that man during the period of development has a much heavier death-rate. It is not possible to say whether in their natural state the higher kinds of animals possess a higher or lower death-rate during the period of development than when under domestication, but the second of the alternatives seems more likely. It remains to be [33] determined whether the heavy death-rate during development which the human race shows in the comparison is a distinctive natural characteristic belonging to it, or whether it is rather the result of the more or less artificial circumstances in which man is born and reared.

The human race differs as regards reproduction and the rearing of its offspring from the higher species of animals in their natural state, chiefly in three ways: (*a*) In the case of the human race reproduction takes place at all times of the year, whilst the higher animals have one single period for reproducing, or, in some cases, two or three periods; (*b*) animals reproduce as soon as the organism becomes capable of reproduction, whilst in civilised human races as a rule a longer or shorter period elapses between the time when the individual becomes capable of reproduction and the time he actually begins to reproduce; (*c*) in civilised man the development of altruistic sentiments protects weak and sickly persons from the eliminating action of natural selection, and often enables them to take part in the procreation of future generations.

The paper of A. has for its object to examine closely these three arguments based upon very extensive data taken partly from demographic statistics and partly from researches made personally by him or which he caused to be made, especially in the Municipal Statistical Offices of Rome and Cagliari, and in the Obstetrical Clinic of Bologna. The principal results are here indicated.

A. The rule of a greater number of conceptions in Spring observed in temperate regions suffers notable exceptions in tropical and arctic regions. Hence there is a weakening of the idea that in it one should recognise the atavistic heritage of a special season for reproduction which the human race had originally shown, analogous to what one finds to-day in many species of animals. On the other hand, neither the frequency of multiple births, of miscarriages, or of stillbirths, nor the length of life of offspring nor their intellectual capacity show any correlation whatever with the season of conception. The frequency of stillbirths, however, and the length of life of the offspring show a clear correlation with the season of birth, in the sense that those born in temperate seasons show a lower rate for stillbirths and a greater length of life.

B. The age of the mother at the time of parturition does not show any regular influence on the size and weight of the child. It has a very sensible influence on the frequency of miscarriages and of stillbirths; this increases with the increase in age. The age of the mother at the time of marriage exercises a decisive influence upon the vitality of the offspring: the greater the age of the mother at the time of marriage the less will be the vitality of the children.

The age of the father at the birth of his child has some influence on the number of stillbirths among his children. This influence—at any rate above a given age—increases with the increase in the father's age. It can neither be disproved nor affirmed that the age of the father at the time of [34] marriage has an influence upon the vitality of the children; it is certain, however, that if any influence of that kind exists it is much less intense than that exercised by the age of the mother.

There has also been an enquiry as to the effect upon the characters of the offspring exerted by

(1) order of birth; (2) difference in age of the parents; and (3) the age of the woman at the first menstruation.

C. Persons who die at a more advanced age have children in greater number and endowed with greater length of life. For some classes of the unfit (mad, consumptives, suicides) it can be proved beyond question that the number of children born is less and their mortality greater than among married people generally. Those who die of heart disease or of cancer show a number of children slightly higher than the general average of married persons; but that can be attributed to the fact that their age at death is greater than the average age at death of married people.

MATERNITY STATISTICS OF THE STATE OF RHODE ISLAND, STATE CENSUS OF 1905.

(Abstract.)

By Frederick L. Hoffman, LL.D., F.S.S.,
Statistician of the Prudential Insurance Company of America.

As a contribution to the practical study of eugenics the decennial maternity statistics of Rhode Island are of exceptional interest and importance.

In 1905, of 36,766 native-born married women 26,329 (71.6%) were mothers, and 10,477 (28.4%) childless. Of 32,960 foreign-born married women 27,207 (82.5%) were mothers, and 5,753 (17.5%) childless. Contrasting these percentages, the fact requires only to be stated to emphasize its profound and far-reaching social as well as political significance.

Considered with reference to religious belief, 72.7% of Protestant and 80.3% of Roman Catholic married women were mothers. Of married women of Jewish faith 88.0% were mothers.

At ages 25-34, the proportion of native-born mothers having only one child was 35.1%, against 22.6% for the foreign-born; the proportion of mothers having from six to ten children was 6.8% for the native-born, against 12.9% for the foreign-born. At all ages a similar disproportion is apparent.

Vastly more important than the multitude of general social and economic facts are these statistics of what, for want of a better term, may be called *human production*, and which disclose what must be considered the most alarming tendency in American life. Granting that excessively [35]
large families are not desirable, at least from an economic point of view, it cannot be questioned that the diminution in the average size of the family, and the increase in the proportion of childless families among the native-born stock is evidence of physical deterioration, and must have a lasting and injurious effect on national life and character.

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[36]

Section IV.

Medicine and Eugenics.

THE PROPHYLAXIS OF HEREDITARY SYPHILIS AND ITS EUGENIC EFFECT.

(Abstract.)

By Dr. H. Hallopeau.

Syphilis is strongly *dysgenic*; it causes the production of profoundly damaged children; in preventing it the physician co-operates effectively with eugenic action. In order to prevent the propagation of this disease we must have recourse to *administrative prophylaxis*, *prophylaxis by persuasion*, and *prophylaxis by medical measures*.

Administrative prophylaxis must act especially by multiplying gratuitous consultations and in securing, as far as possible, hospital treatment for persons affected by transmissible lesions, especially for prostitutes.

To the physician belongs the duty of acting by *persuasion* in pointing out to syphilitics that they have no right to have children so long as they are liable to transmit their disease to their offspring.

We must abort syphilis if it is in the stage of primary invasion: this invasion is not, as was believed until recently, confined to the chancre and its accompanying swellings; it includes all the intermediate stage; in order to destroy the tripanosomes we must use repeated injections of *benzosulfoneparaminophenylarsinate of soda*, commonly known as *hectine* (Mouneyrat), the only specific medicament which is well borne locally.

Results similar to those we have just shown are obtained by making, in a given region, two or three injections of salvarsan. However, the comparison between the two medications is altogether in favour of that by hectine. Indeed, experience proves that the secondary generalization is noticeably more frequent after injections of salvarsan, and, besides, these are far from being always painless. We have made known to the Académie of Medicine a case in which, within 48 hours, they caused the death of a young man in good health. Several similar cases have since been notified, particularly by Dr. Gaucher. Confidently believing in the axiom "Primo non nocere," we explicitly declare ourselves adversaries of a practice which brings such accidents in its train.

In the secondary stage, we must have recourse simultaneously to various specific agents.

Procreation may be permitted when six months after the abortive treatment Wasserman's reaction, after several trials, has given uniformly negative results.

The physician thus accomplishes a profoundly eugenic work in favouring and accelerating the production of unspoilt children.

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[37]

THE EFFECT OF ALCOHOL ON THE GERM-PLASM.

(The New Alcohol Legislation in Norway.)

(Abstract.)

By Dr. Alfred Mjoën.

The injurious effect of alcohol depends not only upon the amount taken, but also upon other factors, as, *e.g.*, upon its dilution, and upon the kind of nourishment taken with it. There can be no doubt that alcohol under a certain percentage neither injures nor can injure either the somatic cells, or what is more important for race-hygiene, the germ cells. And, on the other hand, it must be regarded as proved that alcohol over a certain percentage is injurious to the quality of the offspring, not alone where the mother drinks (influence upon the embryo), but also where the father alone is a drinker (destruction of the germ). The latest investigations in this field confirm this assumption.

There is, it is true, a middle class of beverages whose influence upon the germ-plasm (posterity) has not been established, or can be established at all. As a general rule, one may lay down the rule: *The injurious effect of an alcoholic beverage upon individuals or race increases from a certain percentage progressively with its increasing contents of alcohol.*

Therefore, I propose to divide alcoholic liquors into classes, and to deal with them according to the amount of their contents of alcohol, *i.e.*, according to their injuriousness.

All casks, bottles, etc., coming into the market are to be furnished with the class-mark (*e.g.*, I., II., III., branded upon the cord).

For example, in the case of beer, the first class (under 2 ¼ %), shall be obtainable everywhere. For this class there will be claimed, besides a reduction of duty, also a facility for sale and some concessions. Class I. (up to 2 ¼ %) will be charged with 2 ore; Class II. (2 ¼ —3 ¾ %) with 8 ore; and Class III. (3 ¾ —5%) with 15-16 ore per litre. Beer over 5% or 5 ½ % will be prohibited([3]).

[3] This proposal was favourably received by the Norwegian minister Knudsen, and brought before the Storthing as a Government measure. The proposal has been accepted as part of the election programme of the Radicals, the Socialist Democrats, and all total abstinence organisations.

The class system permits of a simple, cheap, and practicable control, and, indeed, a control which is not confined to the brewery or to any single stage of preparation, but which follows the article over the whole country from its origin to its consumption. When alcoholic drinks are marked with their class and placed under State control, the consumers will themselves easily exercise the control. And the public will gradually become accustomed to form an opinion upon the influence of the various articles upon the working capacity and the health, not only of the individual, but also of the family and the race. State and country authorities will, with State-controlled classes, more easily see justice done on all sides. This last advantage will, naturally, [38]

only avail in those lands where the permission to sell alcoholic liquors is vested in the local authorities. The progressive class system will also give the State, the municipalities, and also private labour organisations an opportunity to support those restaurants and inns which supply nothing but pure and harmless liquors, and consumption will undergo a slow and gradual change to the lightest drinks.

At the present time the lightest kinds of beer are too heavily taxed in comparison with the heaviest kinds, and the latter in turn are too heavily taxed in comparison with brandy. From the point of view of race-hygiene, the fight must be directed especially against the fourth and most dangerous class, namely, all kinds of brandy (prohibition or Ivan Bratt's system), as well as against the mixed wines, which are so often adulterated and injurious.

ALCOHOLISM AND DEGENERACY.

Statistics from the Central Bureau for the Management of the Insane of Paris and the Department of the Seine from 1867 to 1912.

(Abstract.)

By M. Magnan,
Chief Physician to the Central Bureau, Member of the Academy of Medicine,
And Dr. Fillassier.

From 1869 to 1912 the number of sick persons received at the Central Bureau of the St. Anne Asylum has gone on steadily increasing: occasionally signs of a falling off are noticed, quickly compensated by the number of entries for the following years.

Among these patients a great number are driven to the asylum by the abuse of alcoholic drinks. Some of these are simple alcoholics, *i.e.*, those who owe their insanity entirely to excessive drinking; the others make up the numerous group of degenerates, who are for the most part descendants of alcoholics, and on whom fall all the forms of physical, intellectual, and moral degradation.

For these last, alcohol has been but the touch of the trigger which has put in action their disposition towards insanity; the attack of mania, when past, leaves revealed psychic troubles, which, but for the turning of the balance by alcohol, would have remained in the latent condition, but which, once developed, remain often for a much longer time; so we see the increase in the [39]
number of these patients—occasional drunkards—keeping pace with that of chronic alcoholics.

These will specially call forth the interest of the members of the Eugenic Congress. From the clinical point of view they exhibit great importance; for showing as they do all the episodic syndromes of degeneracy, all the mental forms of it may be seen—maniacal, melancholic, idiotic: insanities polymorphous or systematic, fixed ideas, monomanias connected with words or numbers, every sort of phobia, obsession, impulse, and symptomatic manifestation of great importance. When their objective lies in sexual perversion, theft, arson, murder, etc., these various states raise the most delicate questions whether from the point of view of philosophy, psychology, sociology, or forensic medicine.

This class of society, in the grip of this poison, is unfortunately not sterile; their miserable descendants come to dock in the asylum; so much so that if we mass together the various elements, if we add the unfortunates permanently disabled, such as epileptics, and the increasing crowd of feeble-minded, idiotic, tuberculous children, the mind recoils aghast at the gravity of the danger. The necessity of an implacable war against alcoholism, which crowds our asylums, our hospitals, and our homes with insane persons, and sends a constant stream to our prisons and reformatories—such a war must be the principal aim of the Eugenics Congress.

For long the evil genius of mankind, alcoholism has to-day laid its clutch on women, and the admission figures now show their numbers on the increase every year.

Such are the lessons which may be learnt from the report of Magnan and Fillassier.

EUGENICS AND OBSTETRICS.

(Abstract.)

By Dr. Agnes Bluhm, *Berlin.*

1. Among the agencies under social control which impair the racial qualities of future

generations, an important place is taken by the Science of Medicine, especially by Obstetrics. For the increase of obstetrics increases the incapacity for bearing children of future generations.

2. The great difference in the capacity for bearing children between the primitive and civilized races depends only in part on the lessened fitness of the latter due to the increase of skilled assistance.

3. Incapacity for bearing children can be acquired; it develops, however, abundantly on the grounds of a congenital predisposition.

4. In so far as the latter is the case, obstetrics contributes towards the diffusion of this incapacity.

5. The most serious obstacles to delivery are effected by deformities of the pelvis, in at least 90% of which heredity plays a part. In this connection, rickets, the predisposition to which is inherited, takes the foremost place. [40]

6. German medical statistics make it appear probable that incapacity to bear children is on the increase.

7. Medical help in childbirth brings, undoubtedly, numerical advantage to the race, but it endangers the quality of the race in other ways than through the fostering of unfitness for bearing.

8. The danger of the increase of incapacity for bearing through the increase of assistance in childbirth can be combatted:—

(*a*) Through the renunciation of descendants by women unfitted to bear children.

(*b*) Through an energetic campaign against rickets, to which only the predisposition can be inherited.

(*c*) Through the permeation of obstetrics with the spirit of eugenics, so that the obstetrician no longer proceeds according to a settled rule (living mother and living child), but in each separate case takes into consideration the interests of the race.

HEREDITY AND EUGENICS IN RELATION TO INSANITY.

(Abstract.)

By F. W. Mott, M.D., F.R.S.,
Physician to Charing Cross Hospital and Pathologist to the London County Asylums.

What is insanity? Every case of insanity is a biological problem, the solution of which depends upon a knowledge of what a man was born with—Nature—and what has happened after birth—Nurture. The increase of registered insanity in London; the causes of the increase. (1) The standard of insanity has been raised. (2) The increase of accommodation for reception of the insane. The diminishing death rate in asylums causing a progressive accumulation. The diminished number of recoveries. (3) The large proportion of old people admitted to asylums formerly in the infirmaries.

Nurture.—The correlation of pauperism, insanity and feeble-mindedness, alcohol, syphilis, and tuberculosis in relation to insanity and feeble-mindedness. Congenital mental deficiency as distinguished from hereditary mental deficiency. Chronic poisoning of the blood by these agencies in relation to a lowered specific vitality of the germ cells. Environment in relation to mental energy and will power. [41]

Nature.—The study of pedigrees in hospital and asylum patients showing the importance of heredity in nervous and mental diseases. The nature of the neuropathic tendency; its transmission in different forms of nervous and mental disease in successive generations. Its latency and re-appearance in stocks. Relation of neurasthenia to the neuropathic taint. Conclusions arrived at in relation to heredity and insanity from a study by a card system of 3,118 related persons who are at present, or who have been, in the London County asylums. Among the 20,000 inmates at present resident, 715 are so closely related as parents and offspring or brothers and sisters. Nature is always trying to end or mend a degenerate stock if left to itself. Analysis of data regarding first attack of insanity in 464 parents and their 508 offspring; the signal tendency to the occurrence of the disease in a more intense form and at an earlier age in the offspring. This "antedating" or "anticipation" in relation to Nature's process of elimination of the unfit. Nearly 50 per cent. of the offspring affected 20 years earlier than the parent. The same found in uncles and aunts with nephews and nieces, only not nearly so marked. Seeing that the unfit are at present able to survive; does nature end or mend degenerate stocks, or have the lines of neuropathic inheritance only been partially cut off by this tendency to "anticipation"? What we want to know is: What is the fate of all the offspring of an insane parent or parents; for there are

a great many facts which show that a disease may be latent and re-appear in a stock when the conditions of mating or environment are unfavourable? A collection of pedigrees is required which will prove conclusively that the offspring of insane parents, who are free from the insane manifestations during adolescence, will breed children who will not become insane. Supposing it were shown that cases discharged as recovered had the seeds of insanity, by the fact that their progeny were feeble-minded, epileptic, or insane, it would be a clear indication of taking measures to prevent them handing on the disease. Recurrent insanity—the birth of children in the sane intervals. Analysis of pedigrees with a dual neuropathic inheritance of maternal and paternal stocks compared with single neuropathic inheritance. Conclusion that a child born of neuropathic inheritance in both ancestral stocks stands, on an average, the chance of being insane four times as great as when only one stock is affected. Are there any types of insanity especially liable to be transmitted in the same form or another form? The prediction of the racial value of an individual inheritance can only be predicted by a study of what a man was born with—Nature, and what happened after birth—Nurture.

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[42]

THE PLACE OF EUGENICS IN THE MEDICAL CURRICULUM.

(Abstract.)

By H. E. Jordan,
Chairman of the Eugenics Section of the American Association for the Study and Prevention of Infant Mortality.

The Science of Eugenics deserves a place in the medical curriculum for three reasons. Firstly: Medicine is fast becoming a science of the prevention of weakness and morbidity; their permanent not temporary cure, their racial eradication rather than their personal palliation. Eugenic conduct is undeniably a factor in attaining the speedy achievement of the end of racial health. Eugenics, embracing genetics, is thus one of the important disciplines among the future medical sciences. The coming physician must have adequate training in matters relating to heredity and Eugenics. Secondly: as the general population becomes better educated in matters of personal and racial health and hygiene it will more and more demand advice regarding the prevention of weakness in themselves and their offspring. The physicians are logically the men who must give it. Thirdly: physicians will be more efficient public servants if they approach their work with the Eugenic outlook on life.

Instruction in Eugenics, in the form of a number of special lectures on the subject, is already given in some of our medical schools. This indicates at least that the need is felt and the importance of such knowledge to the best physician recognised. Since not all of the better medical schools give such courses, however, we may infer that there are obstacles in the way. What is the nature of these?

One such may be the lack of adequate preparation on the part of the students in the fundamentals of biology to properly comprehend the import and application of Eugenic facts. This obstacle is speedily being removed; for considerable biological training is already a medical course prerequisite. But there may be a lack of properly prepared teachers to present this subject to even properly prepared medical students. This obstacle is also fast disappearing. Once the demand for this kind of help is voiced, there will appear properly trained teachers to instruct physicians.

Another obstacle may be raised by short-sighted and self-seeking physicians, for whom less illness and weakness may mean less work and a reduced income. But this is, perhaps, only a relatively very small factor in, and also only a passing phase of, the opposition, and will soon correct itself.

The most encouraging prospect for this new scheme of activity is the deep interest shown by young medical students in matters of heredity and Eugenics.

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[43]

A HEALTHY SANE FAMILY SHOWING LONGEVITY IN CATALONIA.

(Abstract.)

By Professor I. Valenti Vivo.

I. A healthy family showing longevity in Catalonia: the greater part of them died over 60 years

of age from acute sickness. All belonged to the districts of Barcelona and Gerona. A record of their ability in medical science, art and agriculture, their average fertility.

II. Communication on Biometrika: Licentiates in medical science, 50 scholars, 1910: 70 in 1912. Dates: Cephalic index, stature, span, dynamometer, age, district.

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[44]

SOME REMARKS ON BACKWARD CHILDREN.

(Abstract.)

By Dr. Raoul Dupuy.

When we speak of a backward child, we mean any subject which is arrested or retarded more or less completely in its bodily, psychical, and sensorial evolution, in consequence of congenital and acquired lesions, or simply in consequence of physiological troubles, which concern, either at the same or a different time, the brain and the glands of internal secretion (the thyroid, the hypophysis, the suprarenals, and the genital glands). The cerebral lesions, practically incurable in the present state of science, produce "atropic backwardness" the functional troubles of the brain, or those caused by the glands of internal secretion, which can be modified by "combined organotherapy" produce dystrophic backwardness. We also, however, find mixed types, half of the one and half of the other, which are similarly susceptible of improvement. The number, and above all the variety of the types of dystrophic backwardness, makes a general classification of them impossible. The study of their bodily, psychical and sensorial anomalies proves that in most of the manifestations of backwardness and immaturity, these children present perversions of evolution which have a common bearing on the development of body, mind and spirit. Although apparently different from one another, these backward persons, whether the mischief be corporal, psychical or sensorial, show pathological peculiarities, which prove that the cause of their various dystrophies have a similar origin, and that they often arise from defective function of the sympathic system which appears to be brought into action by the internal glands. The backward children consist of intoxicated, under-grown or anæmic persons, who, besides, suffer from retention of substances, which ought normally to be eliminated, chiefly the chlorides and phosphates (in cases of apathy) or the hyper excretion of the same substances (in cases of instability). Moreover, the combined organotherapy ought to be considered as a "perfect touchstone" of dystrophy, and if applied according to certain rules, it gives results which are more complete and more certain than thyroid organotherapy by itself. It goes without saying that a special training is necessary for the intellectual "backwards"; but before any attempt at education, it is necessary to treat their bodily deficiencies, and to place them in the special schools with the boarding system, where they will be under the eye both of the doctor and of the teacher.

FIRST INTERNATIONAL EUGENICS CONGRESS,

LONDON,

July 24th to July 30th, 1912,

UNIVERSITY OF LONDON,

SOUTH KENSINGTON.

CATALOGUE

OF

THE EXHIBITION.

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References in the Index refer to the Alphabetical Enumeration in the margin of each page of the Catalogue.

The Exhibition Committee desire to take this opportunity of expressing their thanks to the Exhibitors for the loan of their exhibits. They desire specially to acknowledge the courtesy of Professor von Gruber for giving permission to make use of Translations from the Catalogue of the International Congress of Race Hygiene held in Dresden last year.

INDEX TO EXHIBITS.

G

H

I

[E1]

First International Eugenics Congress,

London, July, 1912.

LIST OF EXHIBITS.

A.

Exhibited by E. G. Wheler, Esq.

A 1 Portrait of Sir Francis Galton, by Charles Furze, 1903.

A 2 Silhouettes of Dr. Erasmus Darwin and his son Erasmus.

A 3 Silhouette of Mrs. Darwin.

A 4 Silhouettes of Samuel Tertius Galton, his son Erasmus and three daughters.

B.

Exhibited by William E. and Leonard Darwin

B 1 Portrait of Charles Darwin, by W. W. Ouless, R A., painted in 1875.

B 2 Portrait of Erasmus Darwin (after Wright, of Derby), the common grandfather of Charles Darwin and Francis Galton.

B 3 Photograph of Charles Darwin, by Maull & Polyblank, taken about the year 1854.

B 4 Leopold Flameng's Engraving, after the portrait of Charles Darwin, by the Hon. John Collier, painted in the year 1881—now in the National Portrait Gallery.

B 5 Photograph of Charles Darwin on his horse Tommy.

B 6 Photograph of the small study at Down in which the "Origin of Species" was written.

B 7 Etching by Axel Haig of the large study at Down, which Charles Darwin occupied from about 1887 onwards.

B 8 Water-colour Drawing of Down House, by Albert Goodwin, painted in 1882.

B 9 Two letters of Charles Darwin, on "Worms and their Habits,"

C.

Exhibited by Professor von Gruber.

C 1 & 2 Experiments by P. Kammerer on changes produced in the colours in the skin of the Fire Salamander—Salamandra maculosa—by keeping them on yellow or black earth respectively.

According as to whether the animals are kept on yellow or black earth the yellow or black colouring of the skin spreads, and this change of colour appears in the same way in the offspring, [E2] though a direct influence of the colour of the earth on the germ plasm is absolutely unthinkable. The two pictures in the lower part of Figure C 1 show the colouring of that generation to which the animal portrayed above belongs, according as to whether they have been kept permanently on yellow soil (right) or returned again to black soil (left). Here, it is true, it is not a question of a new quality or tendency. The capacity in the parents to deposit black pigment in their skin has been increased or decreased according to their surroundings. But the distinctive point remains, that their offspring is subsequently endowed with the inherited tendency to produce proportionately more or less pigment. This may, however, be a direct result of the abnormal life conditions of the parents, in so far as the depositing of more or less pigment in the skin of the

parents is certainly not a purely local process, but rather is bound up with other metabolic changes which may extend to or influence the developing gametes.

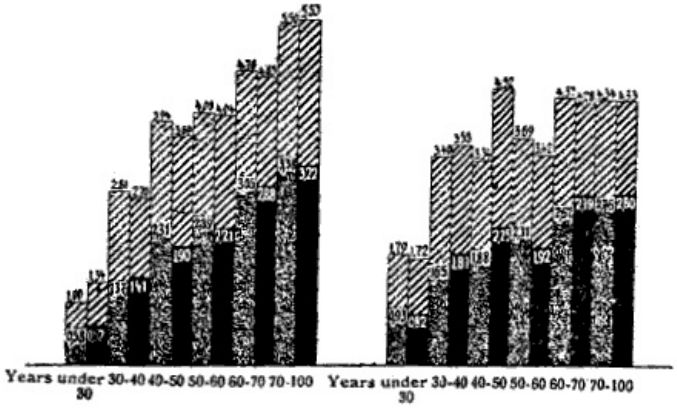
C 3 & 4 Very remarkable are the hereditary changes which Kammerer established in Alytes obstetricans—the midwife toad.

With them copulation normally takes place on dry land. The male extricates from the female the string of eggs, winds it round his hind legs and carries it about until the eggs are ready. Then, and not till then, he enters the water where the larvæ escape. If, however, one keeps these toads in a high temperature (25-30 C.) they enter the water to cool themselves and abandon their normal way of manipulating their brood because the string of spawn swells in water and does not remain sufficiently sticky to allow the male to fasten it to his thighs. The animals become gradually accustomed to live in water, and continue to carry on the business of reproduction there, even when the temperature is normal. As soon as the new instinct has become sufficiently established with the parents they beget offspring, which at a normal temperature go of their own accord into water to deposit their eggs, and also produce eggs more numerous than, and somewhat different from, those of the normal toad. Further, the males of this succeeding generation develop thumbs and forearms of a character which enables them to perform the difficult task of holding the females during copulation in the water.

C 5 & 6 The likeness of offspring to their parents is extremely great and goes into many details; this we frequently overlook because a divergence strikes us more than a similarity. A similarity becomes striking when it is a question of familiar peculiarities. These often relate to exterior unimportant peculiarities. Our collection contains a pedigree (taken by Dr. Walter Bell from [E3] Bateson's "Mendel's Principles of Heredity"), Figure C 5, of a family with peculiarly curled hair; also in Figure C 6, a case of heredity of a lock of white hair, likewise taken from Bateson's work by Rizzoli.

C 7 The heredity of physical qualities is strikingly illustrated in Weinberg's Table C 7, showing the age at death of the parents and the marital gross and nett fertility. It is founded on the Stuttgart family registers, and comprises about 1,900 non-tubercular and about 3,000 tubercular families ("Archiv für Rassen and Gesellschafts Biologie" and Württemberger Jahrbücher für Statistik und Landeskunde, 1911). W. Weinberg adds:

Relation of Age at Death of Parents to Gross and Nett Fertility.
(After Weinberg.)



- Non-tuberculous families, number of children surviving 20th year.
- Tuberculous " " " " "
- Non-tuberculous families, number of children dying before attaining 20th year.
- Tuberculous " " " " "

Number of non-tuberculous families about 1,900 (1876-79-86), of tuberculous about 3,000 (1873-89); from Stuttgart family registers.

Figure C 7.

"The gross as well as the nett fertility of those which have died increases with the age attained, the latter, however, in a greater degree, because the mortality of children decreases with the greater age attained at death. With the wife the curve is less steep and less regular, because in her case mortality is unfavourably influenced by the birth functions; this is particularly plainly seen in the case of tuberculous women, when the curve has two peaks."

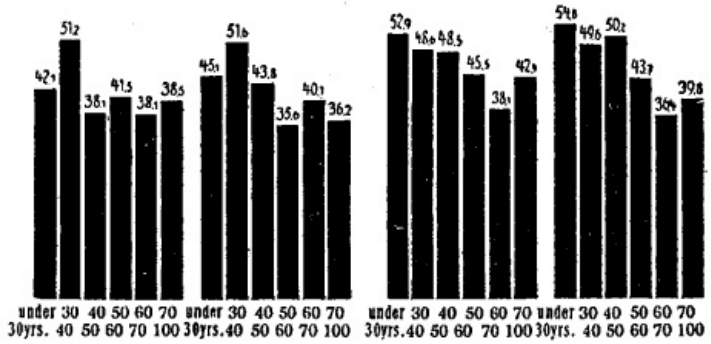
C 8 The same fact of heredity of "constitution" is demonstrated in Weinberg's Table C 8 showing the age at death of the parents and the mortality of the children up to the age of 20. It is based [E4]

on the same material as Table 7 and proves: "With the increasing age of the parents child mortality decreases, especially so in the case of the children of the tuberculous, and the number of children reaching the age of sexual maturity increases correspondingly."

AGE AT DEATH OF PARENTS AND MORTALITY OF THE CHILDREN UP TO THE AGE OF 20 (INCLUDING STILL-BORN).

Non-tuberculous. Tuberculous.

Deaths per 100 living-born children:



Age at death of father of mother — of father of mother

Figure C 8.

C 9 & 10 The same is proved by the two Tables C 9 and 10 by Ploëtz referring to age at death of fathers and mothers and child mortality up to the age of five years. Very striking in both these tables is the extremely low mortality of the offspring of the parents with the greatest longevity.

C 11 Table C 11 by Weinberg: Hereditary of the disposition to beget twins (Archiv für Rassen & Gesellschafts Biologie VI. 1909) is remarkable. "The difference in favour of sisters speaks for Mendel's law of dominance and recessivity. The more twins a woman has borne, the more frequently the same phenomena is found in her nearest female relations." That the mortality among twins is very great is a well-known fact.

INHERITANCE OF TENDENCY TO BEAR TWINS.

About 2,000 families from Würtemberg family registers (after Weinberg).

IN EVERY 100,000 BIRTHS TWIN BIRTHS OCCUR IN THE FOLLOWING NUMBERS:

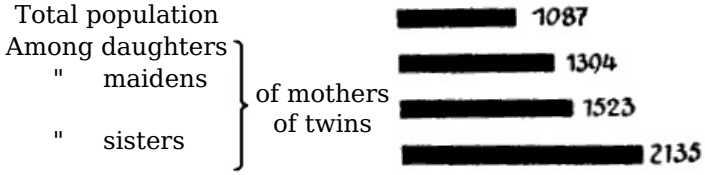
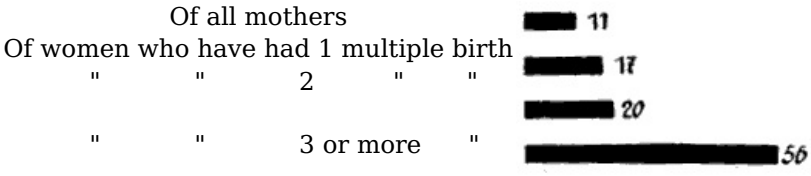


Figure C 11.

IN EVERY 1,000 BIRTHS THERE ARE THE FOLLOWING NUMBERS OF TWIN BIRTHS AMONG THE IMMEDIATE RELATIVES: [E5]



MORTALITY OF TWINS.

Percentage of deaths before the age of 20:

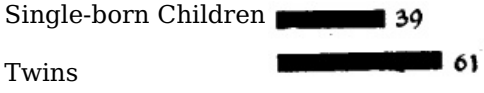


Figure C 11 (*continued*).

C 12 Figure C 12 the celebrated pedigree of the Hæmophilic family (bleeders) Mampel (by Rüdin after Lossen).

C 13 Figure C 13 showing the inheritance of progressive muscular atrophy (after Eichhorst).

C 14 Figure C 14 a partial reproduction of a pedigree comprising over 2,000 people of the family Nongaret suffering from inherited stationary night blindness (compiled by Cunier, Truc and Nettleship). With regard to these figures it is to be noted that only a fraction of the offspring is affected with the illness, the remainder being perfectly normal. It is remarkable with the bleeders (Hæmophilic persons) that the females do not suffer from the disease though they transfer it to their male offspring; a similar latent disposition is observable in other hereditary conditions, especially colour-blindness.

C 15 W. Weinberg shows in Table C 15 the frequency of tuberculosis within families. He adds: "This is a comparison of the experiences of married tubercular individuals, regarding the frequency of tuberculosis among their parents, brothers and sisters, with the corresponding experiences of their husbands or wives who come on an average from similar surroundings. The experiences of the latter represent the normal expectation. It is especially striking that the family influence tells most with the children of the well-to-do." The well-known fact that the tuberculous frequently come from tuberculous stock is clearly demonstrated in the figures of this table.

C 16 In Table C 16 Dr. Otto Diem shows the distribution of particular taints in every hundred of the tainted members among the nearest relations (parents, grandparents, uncles, aunts, brothers and sisters) of the entire material he deals with. It is shown for instance that with the mentally sound, [E6]
15% of the tainted relatives were mentally diseased against 45.9% with the mentally diseased. Figure C 17 shows the share of this percentage among the parents only. It is demonstrated that with the mentally diseased a much larger percentage of the total hereditary taint is traceable to parental madness, alcoholism, abnormality of character, than with the mentally sound.

C 18 Figure C 18 corresponds, with figure C 17, except that not only the parents are reckoned but the nearest defective relative in any degree.

C 19 Figure C 19 teaches that the reckoning of all the taints in the ancestry taken together with the collaterals fails to give as clear and convincing a picture of the dissimilarity in the heredity of mentally sound and diseased, as the reckoning of the taints among the parents alone. The establishment of the hereditary taint in the direct ancestry appears therefore by far the more important.

C 20 In Figure 144 (Journal f. Psychologie und Neurologie. XIII. Bd.) Drf. Hans W. Mayer gives a number of examples of heredity among moral imbeciles, and he draws the following conclusions: "Consequently moral defect in frequent combination with alcoholism is hereditary in the highest degree. Remedy: Incarceration of these dangerous individuals, not according to the accidental form of the crime committed, but as diseased and forming a public danger. If there is a risk of escape or if liberty is conceded—undoubtedly sterilization to prevent perpetuation of the defect." This latter course is already followed in North America, and a start has been made with it in Switzerland, at least in cases where the consent of the patients is obtained.

C 21 The pedigree of the family of Zero von Jorger, figure C 21 (Archiv für Rassen & Gesellschafts biologie I.), shows in a convincing manner how very important for the protection of society is the prevention of the reproduction of the degenerate. In the course of time this family has burdened the sound and fit with taxation amounting to hundreds of thousands of pounds. The author remarks: "The family Zero springs from good peasant stock intermarrying with homeless female tramps. Its history shows how alcohol (especially spirits) and bad environment (in this case always combined) may create a scourge to society which continues from generation to generation. The family has produced many criminals, lunatics and feeble-minded persons. The offspring of these are destined to die out. Their great fertility at times is counteracted by great infant mortality."

"In places regeneration is evident which invariably is inaugurated by marriage with a good [E7]
woman and the consequent abandonment of the abuse of alcohol. As with the degeneration so with the regeneration the wife takes the leading part."

The question whether modern civilized races are degenerate in body and mind is much disputed. In some respects for instance in the increase of myopia and caries of the teeth it is generally admitted, but in others it is doubtful, though it may be considered an established fact that the general average of health among all civilized nations is unsatisfactory. We do not know for certain whether the general level of all or certain qualities is being lowered or not, and still less can we say what part is played by heredity.

The demand for the systematic collection of data on these points is the first which Race Hygiene has to make from Governments.

The examinations as to fitness for military service in Germany might offer an excellent index of the physique of the people, but for this purpose the physical condition of the conscripts would have to be recorded in a much more thorough manner than at present (S. Gruber Concordia, 1916). There appears, however, to be no doubt that in general the country and agricultural pursuits produce young men of better average health than do towns and other occupations. This agrees with the fact that the life of the inhabitants in rural districts and of those engaged in agriculture is longer than that of town dwellers.

C 22 Table C 22 compares the duration of life of men living in towns with those living in rural districts in Prussia. Beyond all doubt the peasant population is still constitutionally the most valuable part of the people, and the colonisation at home, such as the Prussian Government is pursuing to an increasing degree, may become of the very highest value for the improvement of the race.

C 23, 24 & 25 Dr. Walter Abelsdorff gives the following explanations to Table C 23, and figures C 24 and C 25. "They endeavour to show the number of families brought 'back to the land' in North Germany in the years 1900-1910."

"The Royal Commission for settlement in West Prussia and Posen has achieved notable results since the beginning of its activity in 1886. This body has brought about from 1886 to 1910 the settlement in the country of 18,507 families, 18,127 in leaseholds and 305 in labourers' dwellings. For 1900 to 1910 the total number of families settled amount to 14,511."

"The Royal General Commission began its activity later, but since 1906 has been energetically [E8] pursuing the settlement of agricultural labourers. At Münster, in the years 1908 to 1910, 247 leasehold small holdings for artisans have been created."

"The results of the Royal District Administrations are as yet less considerable, those of private societies with State subvention, though irregular, are worthy of note."

"The total work of settlement is almost exclusively effected by the Commission for settlements and the General Commission."

"Counting five members to each family, 130,000 people have been brought into economically improved conditions. In how far this may benefit the second generation—the children of the settlers—cannot as yet be determined."

"These efforts, however, may be looked upon as a regenerative component among the measures for the improvement of the people."

C 26 & 27 Figure C 26 deals with the fitness for military service in Germany in relation to the locality of birth and the occupation of the individual or the parents. Table C 27 with fitness for military service in town and country (both after Wellmann).

FITNESS FOR MILITARY SERVICE ACCORDING TO PLACE OF BIRTH AND CALLING.

German Empire, 1902-08.

Percentage of Recruits examined and found fit:

Country born.		City born.	
Employed in Agriculture.	Otherwise.	Employed in Agriculture.	Otherwise.

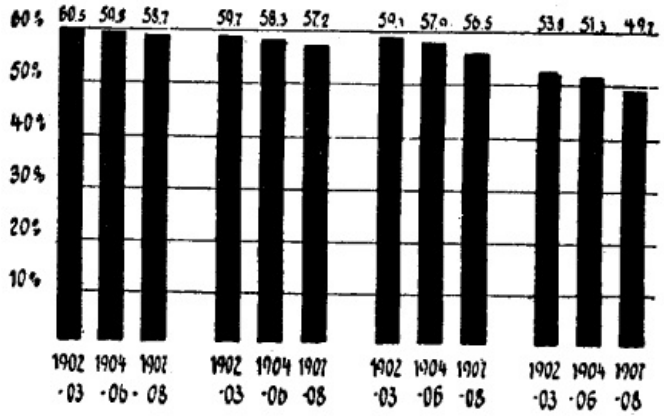


Figure C 26.

FITNESS FOR MILITARY SERVICE IN TOWN AND COUNTRY. (After Wellmann.) [E9]

Trade.	Percentage of fit.	Locality of Birth.			
		Of those examined.		Of both parents.	
		Large city. %	Village. %	Large city. %	Village. %
Brewer	63.4	3.0	55.3	3.0	55.3
Cab Driver	63.3	3.2	69.0	1.6	69.8
Smith	61.2	1.9	71.0	1.2	75.7
Skilled Mechanic	29.7	44.4	10.9	30.9	30.0

Implement maker or Tool maker	28.5	36.3	15.9	24.8	28.3

Figure C 27.

C 28 Enlistments into the Army in Germany in 1907 and 1908, according to size (number of inhabitants) of native place, are shown by Dr. Walter Abelsdorff in Figure C 28.

C 29 Figure C 29 shows the percentage of those found fit in the final examination in Bavaria and occupation of the parents.

C 30 Table C 30 shows the total of all the non-commissioned officers and privates in the German Army on December 1st, 1906, classed according as they came from town or country and according to the occupation or the parents.

Attention is invited to the fact that according to Figure C 26 the percentage of those found fit for military service in Germany has diminished in recent years, but it is doubtful whether this is caused by a general lowering of physique. It may be due to the application of a higher standard in consequence of increased supply. The distinct increase in height, in Germany as well as in many other European countries, of those obliged to offer themselves for military service speaks against deterioration in the average of physique. Against the suggestion that with the increase in height may be coupled a greater disposition to tuberculosis must be set the fact that amongst the tall is found a percentage of fit higher than the average.

Abelsdorff remarks of Table C 27: "The results of recruiting for the years 1907 and 1908 have been grouped according to the size of the place of birth of the recruits.

The average for the whole empire in 1907 is 54.9, in 1908 54.5, fit in every 100 finally examined. The percentage of fitness has diminished 0.4% from 1907 to 1908. The numbers for 1904, 1905 and 1906 are respectively 56.4, 56.3, and 55.9%. [E10]

Towns with over 1,000,000 inhabitants show the smallest number of fit: 1907, 31.4%; 1908, 28.2%. The decline is 3.2%. Compared with the figure for the whole empire it shows 23.5% less fitness in 1907 and 26.3% in 1908.

For towns of 500,000 to 1,000,000 inhabitants the figures are slightly better; they reach 39.9% in 1907 and 44.0% in 1908; an improvement of 4.9% on the figures of the largest towns. The other three classes, viz., towns with 200,000 to 500,000; 100,000 to 200,000 and 50,000 to 100,000 inhabitants, show comparatively little variation in their figures for fitness for military service. They are 50.1% and 48.9%; 47.9 and 48.2%; 51.8 and 51.5%. The differences between the two years are not material. With the towns of from 200,000 to 500,000 and from 50,000 to 100,000 inhabitants there has been a decrease against an increase in those of from 100,000 to 200,000 inhabitants. But the figures for all three classes remain behind the average figure for the empire and so do those of all towns, they show 50.4 and 50.1%.

The most favourable results are yielded by the country districts. Here there were fit in 1907 58%, in 1908 57.7%. A trifling decrease is shown even here. The figures, however, are higher by 3.1% in 1907 and 3.2% in 1908 than the average for the empire. The conclusion is that the fitness is highest in the smallest, and lowest in the largest places.

Taking the average for the Empire as 100, those found fit from country districts number 106, from towns 92, from towns of over 50,000 inhabitants 83, and from towns of over 100,000 only 80."

The tables showing the recruiting results amongst those qualified for the one year voluntary service are particularly interesting.

C 31 In Table C 31 Schwiening (Veröffentlichungen aus dem Militär Sanitatswesen. 40. Berlin, Hirschwald, 1909) gives the figures of those finally passed as fit for military service in the Mittelschulen (secondary schools), which are classified according to their nature. The figures are too optimistic because no account has been taken of those who were found temporarily unfit. The Classical Schools (Gymnasium) give the least satisfactory results.

FITNESS FOR MILITARY SERVICE AND SECONDARY SCHOOLS. [E11]

Of every 100 of the pupils of the following Schools

Class of School:	there were found fit for Military Service:
Classical High Schools (Gymnasium)	
Old Scientific & Classical High Schools (Realgymnasium)	
Lower Grade of Classical High Schools (Progymnasium)	
Polytechnics	
Lower Grade of Scientific Schools	

" " " " and Classical High Schools
Modern Scientific High Schools
Commercial Schools
Training Colleges
Private Schools
Agricultural Schools
Average

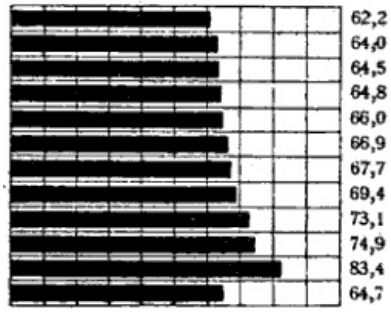


Figure C 31.

C 32 Table C 32 gives the principal reasons for which students have been rejected as unfit for military service.

CAUSES OF UNFITNESS FOR MILITARY SERVICE IN THE GERMAN EMPIRE, 1904-6.
Of every 100 permanently unfit.

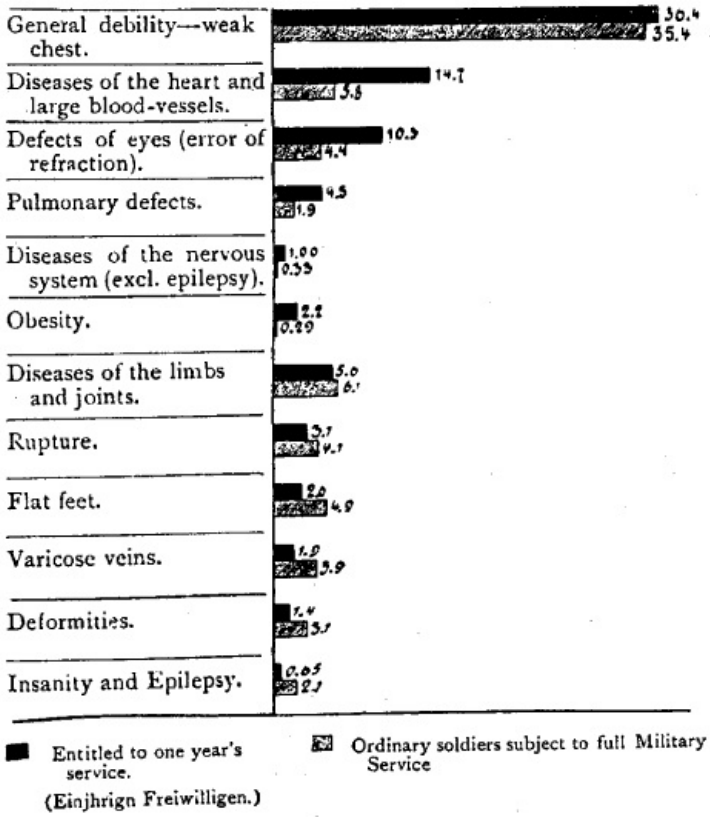


Figure C 32.

C 33 Table C 33 is a comparison of the frequency of the various causes of unfitness as between those qualified for the one year's voluntary service and the recruits in general. This table is very remarkable, because it shows the preponderance of general weakness, diseases of the heart and large vessels, and pulmonary defects among the former. [E12]

MILITARY FITNESS AND SECONDARY SCHOOLS.
Percentage of unfit to every 100 recruits examined.

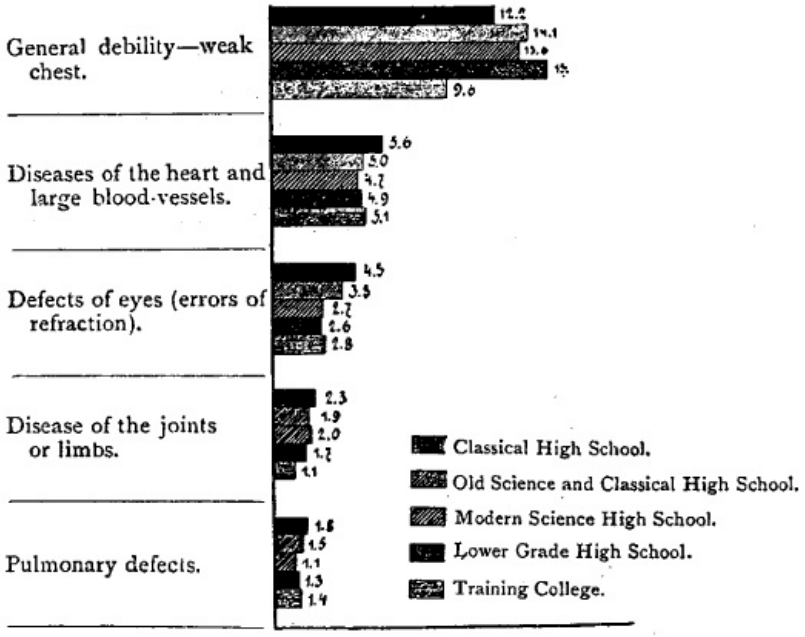


Figure C 33.

C 34 It goes without saying that the schools are only responsible to a lesser degree for this; we have to deal here with a serious symptom of a bad constitution amongst the higher social grades which betrays itself also in the dying out of the socially prominent families. How badly their progeny comes off, in spite of the great care bestowed on it, is illustrated in Table C 34. In two Munich Regiments the percentage of fit among all those entitled to offer themselves for the one year's service from the most varied parts of Germany was only, according to Dieudonné, 21.6, 20.1, and 16.4.

C 35 & 36 Great anxiety is justly caused by the increasing number of those taken care of in public Lunatic Asylums. It remains doubtful to what degree this may be due to the greater use made of asylums and the decrease of the care of the mentally infirm in the family home; the deterioration of the nervous system nevertheless remains according to the general impression an incontestable fact. As a symptom of this may be interpreted the increasing number of suicides in civilised countries, demonstrated in Rüdin's Tables, C 35 and C 36, showing the number of suicides in every one million of inhabitants. [E13]

More serious still than the frequency of mental and nervous diseases is another phenomenon which demonstrates how unsatisfactory is the constitutional condition of large circle of our population of to-day.

This phenomenon which as yet has received much too little attention is the large scale on which families die out, at first in the male line. Apparently (sufficient observations for control are not available) those families which hold an eminent economical or social position (aristocracy, old county families, etc., etc.) are mainly concerned. Because exceptional endowment in one or more respects (intelligence, talent, will power, etc.) is generally required to secure or to maintain a leading position, and because such endowment is given to only a small fraction of the population, but is inherited largely by the progeny, this dying out of the leading families means a serious loss to the race.

The deficient fertility of the stock thus endowed results in a lower average of mental capacity in the population generally, and cannot in the long run be made up by the constant re-appearance of distinguished men appearing as variations, the smallest number of whom are "mutations."

The tendency among town families to die out appears to be wide-spread. Professor S. Schott in Tables C 37-C 40 adds materially to our knowledge on this point, Professor Schott makes the following comment on his Tables:—

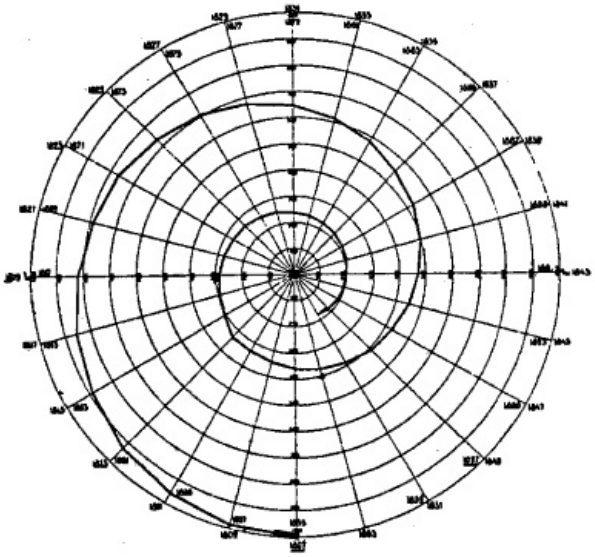
"S. Schott. Old Mannheim families, 4 tables."

"Source: 'Old Mannheim families. A contribution to the family statistics of the 19th Century by Professor Dr. Sigmund Schott, Mannheim and Leipzig, 1910. J. Rensheimer.' Statistical demonstration of the development, decline, and extinction of about 4,000 families which were in existence at Mannheim at the beginning of the 19th Century, based on permanently maintained family registers. This research, pursued on a basis of population statistics, lends itself only to a limited degree to application for biological purposes."

C 37 Gradual extinction of the Mannheim families in the 19th Century. Only extinction by death in Mannheim and in the male line are taken into account. Families which have disappeared through emigration have been excluded. Branches of families which have become extinct at Mannheim may be flourishing elsewhere. Of 3,081 families, 2,538 have become extinct by death at Mannheim itself, 543 survive. The spiral curve shows the number of survivors in any year as so [E14]

many per thousand of the original number.

Old Mannheim Families.



Gradual extinction of Old Mannheim Families during the 19th century.

Figure C 37.

C 38 Average number of children in each generation; the families being grouped according to the number of generations they attained. The families of 1807 (original families) and their descendants were classed into five groups, according to the number of generations they attained in Mannheim. For each group is calculated the average number of children within one generation —for each separate family as well as for the entire family (*i.e.*, the total of all the separate families which have sprung from the same "original family"). For instance: "Original families" which have lasted into the third generation, 464; the separate families show in the first generation, 464 families, 2,377 children; in the second generation, 718 families, with 3,645 children; in the third generation, 754 families, with 2,454 children. Accordingly, the total families show average numbers 5.1, 7.9, 5.3; the separate families, 5.1, 5.1, 3.3. All these averages are minimum figures, because it was impossible to eliminate the moderate number of couples who emigrated before the number of their offspring was completed.

In the generations up to the third inclusive, reproduction may be considered as terminated, but in the fourth, and especially the fifth and sixth, it still is in progress. [E15]

C 39 Age intervals separating the various generations.

Taking into account all the families investigated, the average length of time between the birth of the originator of the family and his first born son was 33 ¼ years, his first born grandchild 63 ⅔ years, and his first born great grandchild 95 ⅓ years. The curves become gradually flatter, because the possible difference between minimum and maximum age distance from one generation to another increases in arithmetical progression.

C 40 Prolificness of first marriages in the 19th century. Taking the entire period from 1811 to 1890 together the percentage of large families (six children or more) and of small families (one-two children) produced by all first marriages, excluding childless ones, is indicated by the horizontal centreline. The positive or negative deviations from the average during each decade are entered respectively above and below this line. The note in Figure C 38 referring to the families which may have emigrated while still productive applies here also. The temporary increase in prolific marriages after 1870 may be in connection with the material decrease in the age of those contracting marriage for the first time, as compared with the preceding decade. (Men 28.65 in the earlier period as against 27.41 in the later, and women 25.92 against 24.68 years.)

The extinction of the families is undoubtedly due partly to other causes than the voluntary limitation of families—to a process of degeneration. A very remarkable proof of the degenerative character of the dying out of families is given by Pontus Fahlbeck in his book, "The Aristocracy of Sweden" (Fischer, Jena, 1903).

C 38-43 The six Figures C 38-43 give what is biologically of greatest interest in it. Note how the terribly quick extinction of the families of the nobility is inaugurated by catastrophic changes: rapid fall in the frequency of marriages, in the number of fertile marriages, and in the number of their progeny. The curves of the surviving families (red in the original tables) are for comparison. That we have to deal here with a natural and not a voluntary process is shown by the rapid increase in the mortality of male youth in the last generations; also by the extraordinary change

in the proportion of the sexes of the children—which, of course, is beyond any control, marked preponderance of girls amongst the survivors (possibly also by the frequency of still-born male children).

A disturbance in the normal proportion of the sexes as a symptom of abnormal germ production may also assert itself in the opposite direction. O. Lorenz has pointed out the frequent occurrence of an extraordinary increase of male children immediately before the extinction of a family in the male line. One of the most celebrated of these cases is the one of the family of the Emperor Max II. He had six sons and two daughters, who all reached the age of maturity, but not a single male grandchild in the legitimate male line. [E16]

C 44 Fresh evidence is exhibited by von den Velden in Figure C 44. With the families described by von Riffel, who have died out in the male line, there is still a great preponderance of boys in the last generation in which boys have reached the age of sexual maturity, whereas there is a preponderance of females amongst the brothers and sisters of the wives of the last male issue of the family.

FAMILIES IN PROCESS OF EXTINCTION.

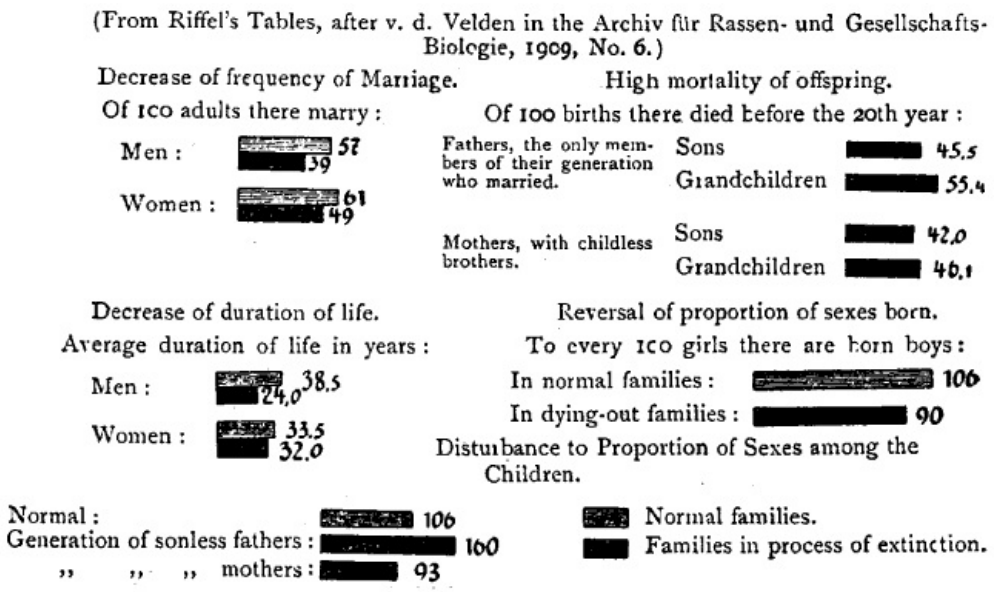


Figure C 44.

C 45 In this connection another figure, C 45, by von den Velden ought to be mentioned. He shows, from investigations made by von Riffel, that the physical condition of childless couples is on the average inferior to that of fertile parents. This, however, by no means holds good in every case. Evidence to the contrary is given by the pedigree of an aristocratic family which has died out in the male line. It may be looked upon as typical. One generation (the second), with three times as many grown up men than women, produces only four boys (44% of the children), of whom two reach maturity. With the fourth generation the male issue dies out. Though a large majority of the members of all three generations (2-4th) have good health and attain to an exceptionally high age, most of the female lines also die out. Only in two branches, which spring from the marriage of an aristocratic daughter with a man from the people, there are children in the fifth generation of whom at least a part promise a healthy progeny. Fahlbeck, too, has drawn attention to the fact that the dying out Swedish aristocracy shows no signs of striking degeneracy in the individual. [E17]

This fact is of the greatest theoretical and practical importance because it proves that there exists, up to a certain degree, an independent degeneration of the germ plasm, even as the germ plasm may remain unaffected by damage to the soma. That such a one-sided degeneration of the germ plasm with respect to the power of reproduction may take place among animals has been known for a long time.

In particular, Chs. Darwin has collected facts of this kind in his "Variation of Animals and Plants under Domestication." For civilised peoples it is a matter for reflection that with animals even slight deviations from their customary "natural" mode of living may lead to such serious consequences.

RACE-HYGIENE.

C 46 & 47 As the nature and aims of race-hygiene are still unknown in wide circles it will be useful to show in Tables C 46 and C 47, by A. Ploëtz, what its position is amongst other sciences and what the various branches of its activity consist in.

Many theoretical workers hold that the most important mission or race-hygiene is to fight against Therapeutics and Hygiene of the individual, for about these they have the most serious

misgivings. They consider, that by maintaining inferior variations up to the age of reproduction, the average quality of the race must suffer and that to certain defects—which otherwise would rapidly disappear—an opportunity is given to spread through an entire people. This point of view, short sighted as it may be, must be examined into. It appears to be forgotten that on the one hand hygiene is powerless in cases of a high degree of degeneration and that on the other hand hygiene, by prevention of illness, does away with a number of causes of inferiority. Finally it appears to be entirely overlooked that with the best inherent qualities and unfavourable surroundings the individual development may be poor and stunted. Of what use are the highest potentialities if they remain latent? The main point is that so far convincing proofs of the [E18]
preponderant harmfulness of hygiene are entirely absent. (S. Gruber, Heredity, Selection and Hygiene. Deutsche med. Wochenschr, 1909).

C 48 THE INCREASING FREQUENCY OF OBSTETRICAL OPERATIONS AND THEIR SIGNIFICANCE to the Race.

(Based on the official statistics of Baden by Dr. Agnes Bluhm.)

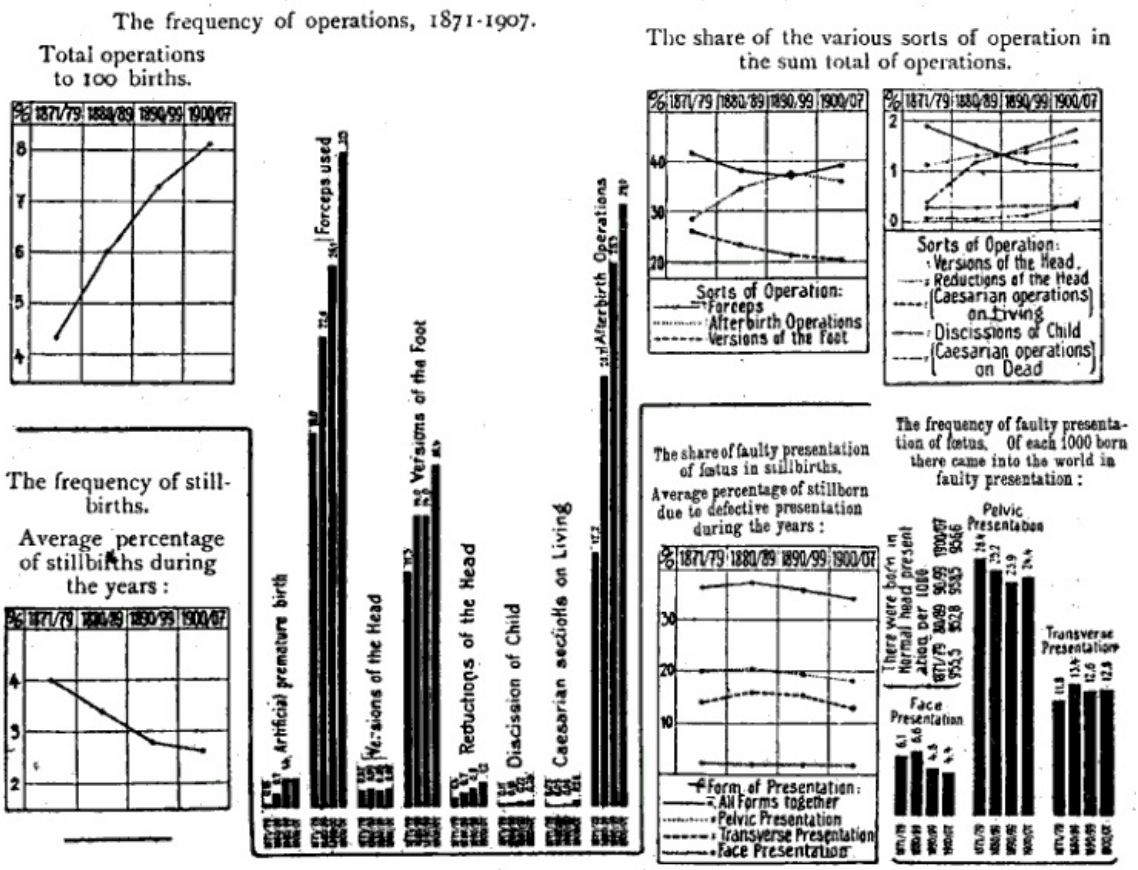


Figure C 48.

Dr. Agnes Bluhm contributes to the question of the deterioration of the race by therapeutic measures in dealing in Figure C 48 with "The increasing frequency of surgical operations in connection with childbirth and its significance for the race." She writes in explanation "The number of doctors having increased relatively much more than the number of the population, it follows that for a growing number of women medical assistance at childbirth is available. To this must be added that progress in surgical technique, above all the diminished danger of infection, allows of a much more frequent operative interference with good results for mother and child. [E19]
Both these facts find expression in the reduction of the number of stillbirths. The purpose of these operations being to assist a diminished birth capacity in women, and this diminished capacity arising partly from constitutional and consequently hereditary factors, this question suggests itself: Is the average birth capacity of women progressively diminished by the fact that an increasing number of women, more or less unfit for childbirth, are artificially assisted in bringing forth living children who inherit this weakness from the mother?"

"Our table attempts to answer this question on the basis of official Midwifery Statistics compiled in the Grand Duchy of Baden reaching back to 1871, that is the beginning of the antiseptic era.

"To avoid the errors, which small figures might lead to, each calculation has been based on the average figures of a lengthy period. The material dealt with comprises over two million births."

C 48-1 "Figure 1 shows the increasing frequency of all childbirth operations taken together. The period 1871 to 1879 shows an average of 4.38 operations to every 100 births, the period 1900 to 1907 up to 8.12 operations to every 100 births."

C 48-2 "Figure 2 shows the frequency of each class of operation in every 1,000 births. Each class of operation shows an increase in number, but the increase has not been uniform throughout the various classes."

C 48-3 "Figure A and B, shows the share of each class of operation in the total number for the various periods. A more leading part is taken by aftermath operations, by artificially induced premature birth, by perforation of the head and by Caesarean section on the living. Aftermath operations depend (like the use of the forceps) to such a degree on the teachings of the various schools for midwifery (and on the time at the doctor's disposal) that they can hardly serve as a standard of birth capacity. The Caesarean section, too, can hardly be taken as a guide, as a much wider view is taken now of the indications for this operation. But the equally increasing numbers of perforations of the head and artificially induced premature birth are well worthy of attention. For these two operations exclude one another. With the existing tendency to avoid perforation of the head by artificially inducing premature birth, a rise in the curve of premature births should correspond with a sinking of the perforation curve. 1871 to 1879 a maximum of the former actually coincides with a minimum of the latter; but from there on both curves rise, though not in [E20]
the same degree. Premature births have become since then (see Fig. 2) more than eight times as frequent; perforations of the head have trebled; and dismemberments of the child have doubled. This fact must be considered as a sign of lessened birth capacity."

C 48-4 "Figure 4 shows the decrease of the total number of stillbirths."

C 48-5 "Figure 5 gives the share which abnormal position of the child has in this total, and a comparison of the two shows that whilst the total has decreased by 1.42% the decrease (1880 to 1889) has been 2.35% in the case of stillbirth through abnormal position. The conclusion is, that there is now more opportunity for hereditary transmission of the tendency to faulty position of the child than three to four decades ago."

C 48-6 "But Figure 6 proves that up to now an increased inheritance of this tendency has not taken place. The curves of these positions not only show irregularities but (with the exception of cross births) a tendency to sink."

"Recapitulation. The growing frequency of surgically assisted births cannot be taken as evidence of a diminished birth capacity, but is closely connected with the growing number of doctors. Against the indications of a diminished birth capacity stand at the moment those which previously could be taken as pointing in the opposite direction. It would, therefore, appear that medical interference at birth has brought to the race advantages as to quantity and no drawbacks as to quality. But it is probable that the picture will change during the coming decades, because only then will the daughters of mothers who could not have brought forth living children without surgical assistance become themselves mothers. The renunciation of motherhood on the part of the women least suited for this function and the war against rickets might act as preventatives."

The great anxiety about the elimination of the severest struggle for existence is based on the undoubtedly erroneous fundamental conception that the organism is a sorry product of necessity which can barely manage to maintain a laborious existence by the constant straining of all its faculties, and that it requires the continuous use of the whip of necessity to prevent an organism from giving way to its inherent tendency to degeneration. In fact, however, no organism is conceivable which has not the "Tendency" to maintain itself and to react accordingly. There are many facts which prove that a wealth of capacities and tendencies is dormant in organisms which [E21]
for innumerable generations have not been active, or, perhaps, have, never functioned in every possible way, and that, therefore, if the occasion arises replacements or accommodations of an unprecedented character may occur. In an unprejudiced system of race-hygiene these facts must not be overlooked. The exhibition in this section gives two specially striking instances; the one from animal the other from plant life.

C 49 To begin with Figure C 49 gives a diagrammatic representation of the development of the eye of a vertebrate—after K. Kraepelin (taken from "Experimentelle Biologie II., T. v. Curt Thesing, Leipzig, Teubner, 1911")—which shows that the lens is formed out of an invagination of the cornea and the retina by an extension of the brain. In the lower part of the plate the various phases of the reconstruction of the lens out of the iris are shown, after it had been removed by a cataract operation from the eye of a Triton larva. (This experiment was carried out by Gustav Wolff.) [A] Thus an organ which normally is not concerned with the formation of the lens takes charge of its regeneration.

[A] Studies in the Physiology of Development II. Archiv. für Entwicklungs mechanic der Organismen, XII. Vol., 3 Part, 1901.

A large number of tables deal with the influence of the numerical position in the progeny, with the number of births and the interval between births, on the health of the children, partly acting alone, partly in combination with the influence of the manner of nourishment during infancy.

C 50 Numerical position in family and infantile mortality, after Geissler. According to these statistics, the fifth child of a mother has materially less vitality than the first four, the second and third children have the most; but this does not agree with other statistics.

C 51 According to Riffel's investigations—influence of the numerical position of the child and the age of the parents at the time of marriage on infant mortality, after v.d. Velden, a material difference between the mortality of the three earliest born children and the three next born is only shown if both parents at the time of marriage have attained a certain age (man over 28,

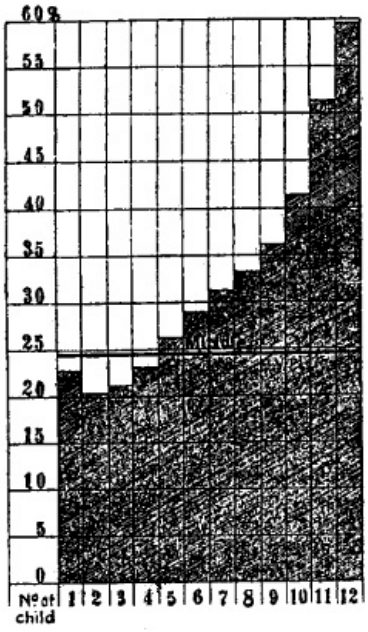
woman over 25); only the seventh to ninth show under all circumstances a materially greater mortality than the earlier children. The children of more aged parents show a materially greater mortality than those of younger parents. The number of children in a family up to the eleventh has no material influence on infant mortality, only in families with twelve children or more a materially greater number of children perish before the fifth year.

RELATION OF NUMBER OF BIRTHS TO INFANT MORTALITY. [E22]

PERCENTAGE OF DEATHS TO 100 BIRTHS.

Geissler.

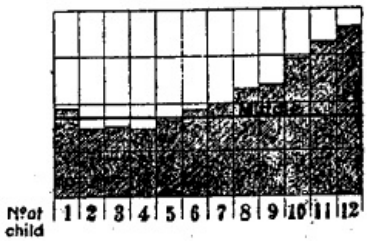
Died during the first year of life.



The mortality of the 1st, 2nd, 3rd and 4th child is below the average. Greatest vitality shown by 2nd and 3rd child.

26,429 births to 5,236 marriages of members of Saxon coalminers' funds. (Some still-born infants, and children of marriages to which there were only one or two births, are not included).

Died before reaching the age of 0.09 of a year, *i.e.*, a little more than a month.

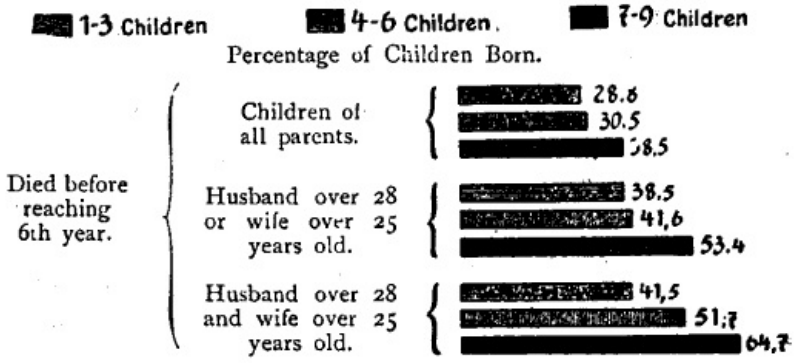


The mortality of the 2nd, 3rd, 4th and 5th child is below the average. Greatest vitality shown by 2nd, 3rd, and 4th child.

Figure C 50.

INFLUENCE OF THE NUMBER OF BIRTHS AND THE AGE OF THE PARENTS AT THE TIME OF MARRIAGE ON INFANT MORTALITY.

(From Riffel's Tables, after v. d. Velden).



INFLUENCE OF THE NUMBER OF CHILDREN BORN TO A FAMILY ON INFANT MORTALITY.

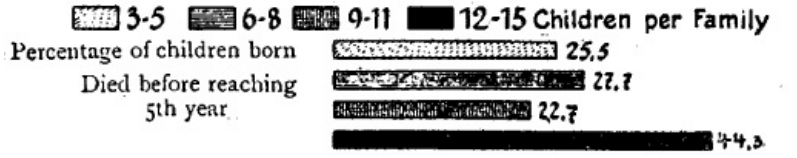


Figure C 51.

C 52 Number of conceptions and conception losses, by Dr. Agnes Bluhm; the exhibitor gives the following explanation— [E23]

Hamburger's material deals with 1,042 marriages of the labouring classes in Berlin, with a total of 7,261 conceptions (an average of 6.97 conceptions for each woman); the material of Bluhm comprises 856 marriages of the wealthier and educated German middle and higher classes with a total of 3,856 conceptions (averaging 4.50 conceptions to each woman). Hamburger has counted as conception losses only miscarriages, premature births, stillbirths, or deaths from illness before the completion of the sixteenth year. Bluhm has included all those up to the twentieth year. Both have only included marriages which have been contracted at least twenty years back. As the births in these marriages apparently date back to twenty years, all living children are reckoned as survivors or conception results, even if they have not attained the sixteenth or twentieth year respectively. This has influenced the result optimistically, but as it has done so with both authors alike, the comparison of their results is admissible.

C 52-1 Figure 1 shows the conception losses in marriages of varying conception numbers (Curve A, Hamburger's working-men's families; Curve B, Bluhm's well-to-do families); both curves confirm Hamburger's words that "the percentage of the survivors gets smaller in proportion as the conception number increases." The mounting of Curve B in the families with ten births is probably a delusion brought about by a very small number. In the marriages with eleven or more births there are lost with the well-to-do one quarter and with the working-classes nearly two-thirds of the conceptions up to the twentieth or sixteenth year respectively.

C 52-2 Figure 2 represents the share which miscarriages and premature births have in the conception losses in marriages of different degrees of productiveness (Curve A, Hamburger; Curve B, Bluhm). Amongst the Berlin labouring classes on the average 17.89 per cent. of all conceptions are lost through miscarriage and premature birth; for the wealthier German families the figure is 7.59 per cent.

C 52-3 Figure 3 shows the share which deaths and stillbirths have in conception losses. With the labouring classes it amounts on the average to 32.75 per cent. (Curve A), and in the wealthier families to 10.55 per cent. (Curve B).

C 52-4 Figure 4. To investigate whether the continuous decrease in the percentage of the survivors, going hand in hand with the increase of maternal conceptions, is caused by the constitutional inferiority of the offspring as the numerical position increases, Bluhm has established, in dealing with her material, the loss for each numerical position (first, second, third, etc., conceptions respectively). If this were the case, Curve A, which gives the loss according to the frequency of conception in each marriage, would have to be identical with Curve B, which gives the loss of first, second, and third, etc., conceptions, but this is by no means the case, for only at a very high numerical position of the conception the curves begin to be parallel. This proves that Hamburger's "the percentage of the survivors gets smaller in proportion as the conception number increases" is not a biological law but only expresses a social phenomenon. With the increasing number of children there is a decrease in the value of each individual childlife. The mother is less careful about avoiding miscarriages; she devotes, and must necessarily devote, less care to each child; and the risk of infectious diseases which are a frequent cause of death during infancy increases.

C 53 How little the increasing mortality of the later born children up to the tenth child is based on a biological law is shown in Figure C 53. Numerical position of birth and infant mortality up to the age of five in princely families, by Ploëtz; 463 seventh to ninth children show the same mortality as the 614 first born.

Pearson endeavored to prove a high degree of inferiority in the first born, physically and intellectually as well as morally. But his results are very open to attack, as Weinberg has recently shown; one is reminded of Pearson's results in Crzellitzer's Figure C 54—first and later born. Crzellitzer writes thus about this—"A high degree of myopia is more frequent amongst first born than among later children. The disadvantage of the first born in respect of myopia is based on a greater hereditary taint and on no other factor. Where there is no hereditary taint about one quarter to one-third are affected, no matter whether first, second, third, etc., born. Also in well-to-do families, where the age of fathers at the time of procreation is materially higher, the first born are more frequently myopic than their brothers or sisters." [E24]

First and Later-Born. [E25]
Percentage of Frequency of Extreme Short-sightedness.

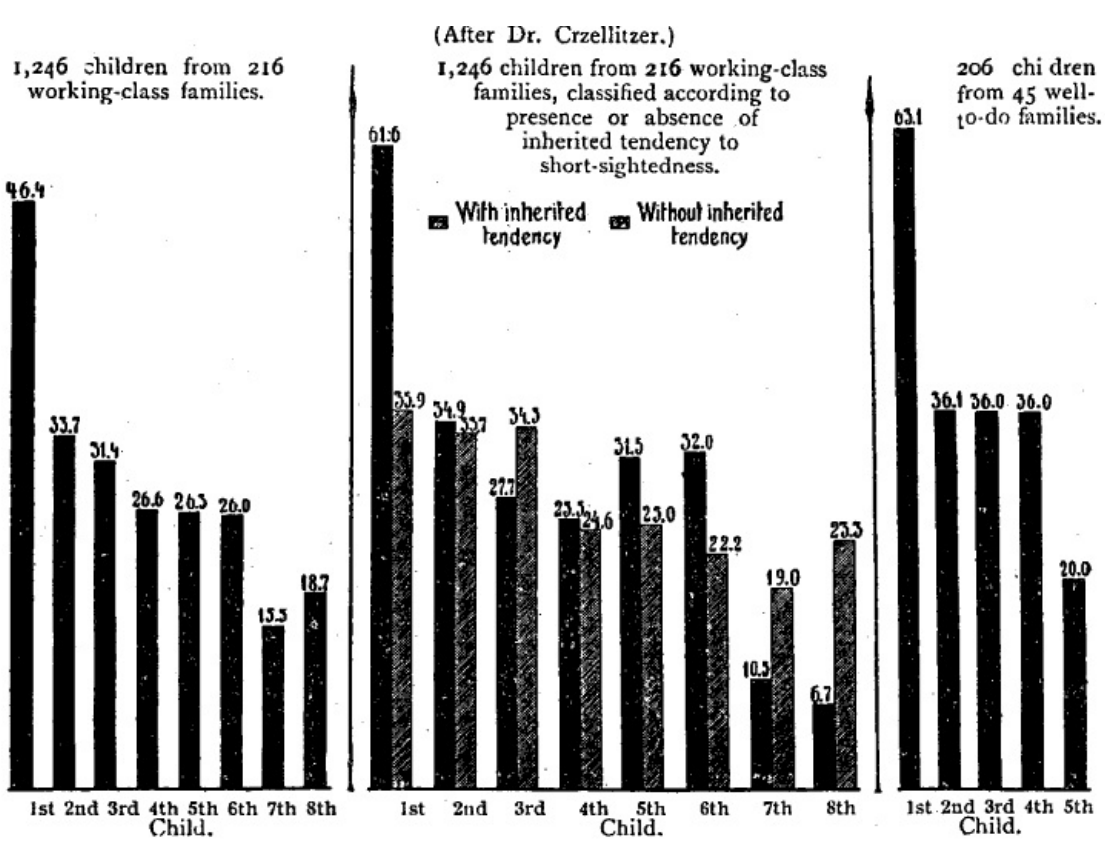
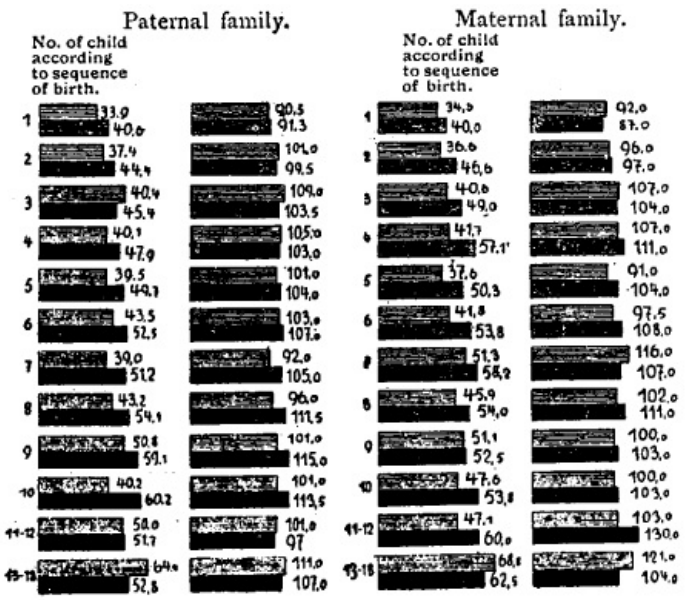


Figure C 54.

A large amount of material has been treated by W. Weinberg, in which tuberculous and non-tuberculous families are compared.

C 55 & 56 Figure C 55—influence of numerical position of birth on infant mortality and Figure C 56—mortality of the first and later born. Weinberg writes concerning these: "The parallelograms in the first row indicate for each position in order of birth how many children out of every hundred die before the age of 20. On this, however, the difference in the mortality in families with different numbers of children has an influence. To counteract this, it has been calculated how many children in each position would die if within each family the number of children had no influence, and the actual number of deaths expressed as a percentage of the expectation calculated in this way gives parallelograms to the second row. After eliminating the influence exercised by the size of the family, the increase of the mortality with the higher birth number appears considerably smaller. Figure C 56, which compares the mortality of the first and last born children, is to a certain extent a test of this. This shows clearly a considerably higher death rate in the last born. Both figures indicate that children of the same numerical position of birth show a higher mortality, if from tuberculous families."

Mortality of Children According to Sequence of Birth
3,129 Tuberculous and 1,830 Non-Tuberculous Families of Stuttgart, 1873-1889 (after Weinberg).



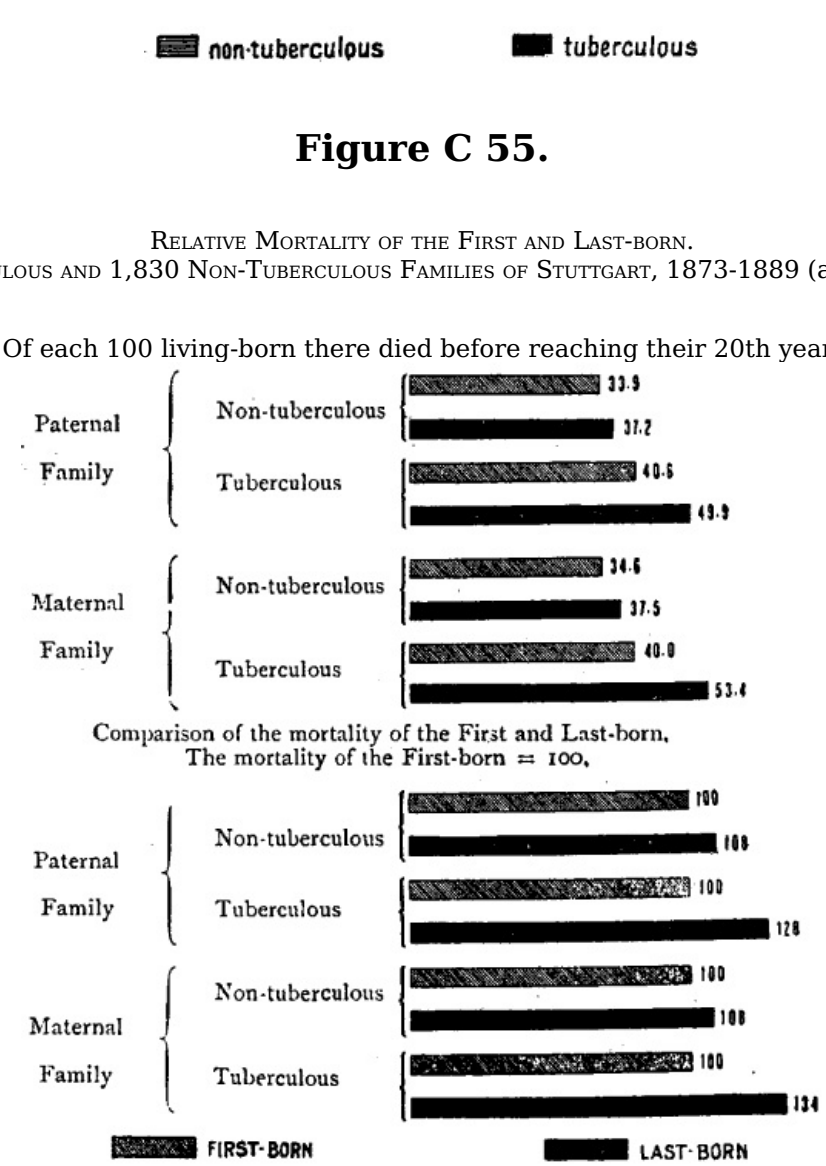


Figure C 55.

Relative Mortality of the First and Last-born. [E26]
3,129 Tuberculous and 1,830 Non-Tuberculous Families of Stuttgart, 1873-1889 (after Weinberg)

Figure C 56.

C 57 Of a materially greater influence than the numerical position of birth or the number of children in each family is the length of interval between births. We point at first to Figure C 57 —interval between births and child mortality, after Ansell and Westergaard, by Dr. A. Bluhm. She writes in reference to it: "Ansell has demonstrated, from the material of the National Life Assurance Society of London, that a child has an increasingly better chance to survive his first year, the greater the interval between his own birth and that of the child born before him. If this interval is less than a year, the infant mortality is double what it is when there is an interval of two years (15.75% against 7.33%). This influence makes itself felt beyond the age of infancy up to [E27] five years but not in so striking a manner. The proportion becomes modified to 20% against 12%. As the influence of the birth interval on child mortality is still very perceptible after the tenth or later children, it may be assumed that it is not caused exclusively by the exhaustion of the maternal organism produced by the rapid sequence of births. The varying length of breast-feeding of the children has probably also its influence. Though these statistics give no data about the mode of infant feeding, it is nevertheless probable that in those families in which there are longer intervals between consecutive births each child is suckled for a longer period.

C 58 Birth interval and health of the offspring, after Riffel—v. d. Velden.

C 59 Influence of the length of the birth interval and the duration of breast-feeding on infant mortality, exhibited by Weinberg. The author writes regarding the latter table "in proportion to the length of the interval between two births, the mortality of the children following decreases materially, but this relation only becomes clearly apparent in families in which several of the children have been suckled for more than six months."

C 60, 61, 62 The intimate connection which exists between birth interval and suckling and the great importance which suckling has under the favourable influence of a long birth interval is shown in Dr. Agnes Bluhm's Figures C 60, C 61, and C 62—infant nutrition (breast feeding), number of children and infant mortality, after Dr. Marie Baum. "The material is taken from the towns of Gladbach, Rheydt, Odenkirchen and, Rheindalen, and comprises 1,495, mostly poor families, with 9,393 cases in which the mother survived childbirth and 9,487 children born alive. In this table only 7,983 children were counted, because the remainder had not reached the age of

one year on the day of counting. Of these 7,983, there died before the completion of the first year 1,276, or 15.98%."

C 60 Number of children and child mortality: Bluhm adds:—"Figure 1 shows in Curve A the influence of the duration of breast feeding; in Curve B influence of numerical position of birth on the mortality of the infant. The very divergent course of the two curves expresses the very different influence of both these factors on mortality; the latter is almost exclusively dependent upon the length of suckling, and shows corresponding with its increase a continuous and steep decline down to 1.46% from a maximum number of 35%. The very slight increase of the mortality of children suckled for six weeks compared with those who have not been breast fed at all is [E28] immaterial (35.55% against 35.28%). These figures prove only that breast feeding up to six weeks does not give the child any protection against fatal diseases. The influence of the birth number hardly makes itself felt up to the seventh child, only from the eighth onwards the power of resistance decreases continuously but not nearly to the same degree in which it grows with the length of breast-feeding (greatest difference only 21%). Curve B shows a materially different course from that of similar curves by other authors, for instance—from Geissler's well-known curve, dealing with Saxon miners, in which not only the first born show up less favourably than the second and third born, but in which, from the fourth child on, the mortality increases rapidly. The economical condition of both groups being similar (85% of Baum's families had a maximum yearly income of £75), it is highly probable that the difference in the curves arises from different methods of infant feeding. In the Rhine provinces, as is also proved by Baum's figures, the feeding is good; in Saxony, however, it is notoriously bad. The co-relation of infant mortality with infant feeding is very clearly illustrated in Figures 2 and 3, the former shows the influence of the length of suckling on the mortality of the children classed in order of birth, the latter the influence of the order of birth in connection with different lengthed periods of suckling. The extraordinarily regular course of all the nine curves in Figure 2 and the extremely irregular course of the six top curves in Figure 3 are very striking. From these figures it is shown that the first, second and third born if breast-fed for a short time only, or not at all, are subjected to much greater risks than the eighth, ninth, tenth or later children, suckled for a sufficient length of time (maximum difference 1 to 42). In the curve showing the children who were breast fed for 39 weeks (Figure 3), the influence of the high birth number shows only to a very small degree."

C 61 Number of children and capacity for breast-feeding. Concerning this it is remarked: "The upper curve shows what percentage of children had to do without breast feeding, and the lower one how many enjoyed the sufficient period of 39 weeks of breast-feeding. Though Baum's figures are only intended to deal with the number of cases of breast feeding and not with its duration, and though no difference is made between exclusive and partial breast feeding, yet some conclusions may be drawn with regard to suckling capacity. In a district where breast feeding is as general as it is in the one examined into here, the number of women who voluntarily renounce every attempt at suckling must necessarily be small. The curve dealing with the children who had no breast feeding at all is therefore likely to give a fairly correct picture of the [E29] absolute or primary incapacity for suckling on the mother's part; absolute incapacity does not of course mean that the mother could not produce a single drop of milk, but that she does not produce enough to satisfy the child, and therefore must resort to artificial feeding. As a period of 39 weeks' feeding, even if only partial, points to a good capacity, the lower curve may also be taken as an expression of feeding ability. A comparison of both figures illustrates that the milk production after the first birth is smaller than after the following ones, and that beyond the eighth birth, it decreases materially and continuously, probably in consequence of the exhaustion of the maternal organism."

C 62 The habit of breast-feeding as running in families and infant mortality. With this goes the following explanation: "The two figures illustrate the proportion of mortality of the infants in 143 bottle-feeding families and 376 breast-feeding families of the first order. As the line could not be drawn very sharply, and as in the bottle-feeding families there had to be included those in which as an exception one or other child was suckled for a few days or perhaps for a week, one can see in these groups only the expression of the habit, but not the power of suckling. Both figures illustrate the largely avoidable sacrifice in young lives which still goes on through a want of knowledge and of feeling of responsibility towards the coming race. With the absence of breast-feeding the unfavourable influence of a very large number of children becomes much more apparent; whereas in breast-feeding families the difference in the mortality between medium-sized families (four to six children) and very large families (above ten children) amounts to only 1.39%, it reaches 12.90% with the non-suckling families. Here, if the number of children surpasses ten, nearly every second child dies in the suckling age, and amongst thirteen families there is not a single one which has not lost a child in that period, whereas in breast-feeding families of the first order, with the same large number of children, only every thirteenth child died in infancy, and of sixteen families seven (= 43.75%) lost no infant." The same material is treated in a different way by Dr. Marie Baum, of Dusseldorf, in Figures C 63-66.

C 63 As the length of the period of suckling of the preceding child increases, there is a constant and rapid decrease in the number of children who are born at intervals of less than one year. If the preceding child was not breast-fed a new birth occurred before the expiration of one year in 9.6 cases out of 100. With a suckling period of one-half to three-quarters of a year of the preceding child, this figure is reduced to 1.8 per cent., and after a still longer suckling period to 1 per cent. Out of one hundred mothers who have only partly or not at all suckled the preceding child, seventy must count on a fresh birth within a period of 1¾ years. If the preceding child was suckled for at least 39 weeks, only thirty-eight, and [E30] with a suckling period of more than a year only twenty mothers have to reckon on a fresh birth within 1¾ years.

DEPENDENCE OF INFANT MORTALITY ON THE DURATION OF BREAST-FEEDING AND THE LENGTH OF TIME INTERVENING

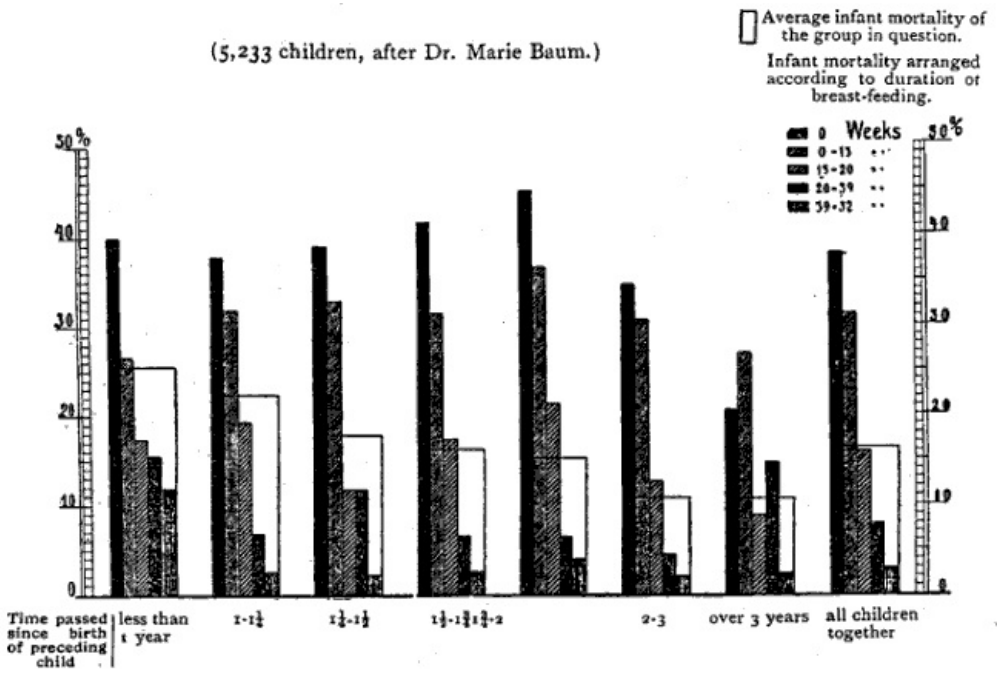


Figure C 63.

C 64 Figure C 64 shows the parallelism between the average length of breast-feeding and the average time between births within the families. A half to three-quarters of the mothers who suckled either long enough or very long show an interval between births of from 1 ¼ to 3 years, whereas of those who did not suckle at all, or only did so insufficiently, only one-third belong to this group, and figure largely in the column of lower birth intervals.

Dependence of Infant Mortality on the Average Duration of Breast-Feeding and the Average Length of Time Intervening between the Successive Births of the Children in a Family.

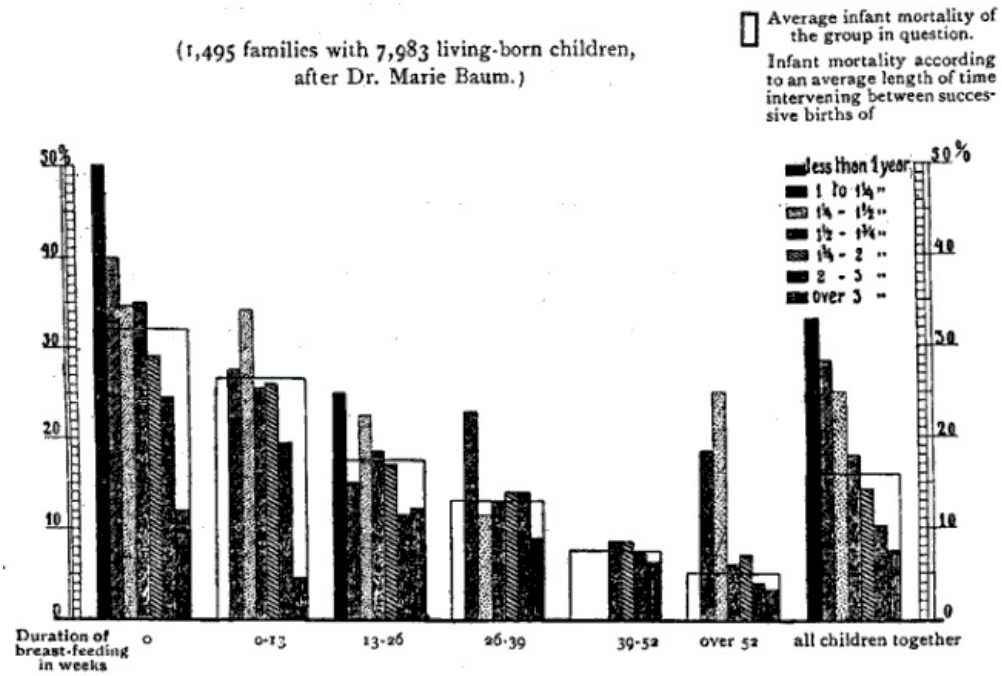


Figure C 64.

C 65 Figure C 65 enables us to examine into the influence exercised by a longer or shorter interval after the preceding birth on the vitality of a child, according as to whether the child was not breast-fed at all or only moderately or amply so. The black oblongs demonstrate that the average infant mortality falls regularly and decisively according to the length of time between the birth of the children considered and their predecessors. The average mortality of infants who are born in rapid succession—under one year, one to one and a quarter years, amounts to over 25 and to 22 per cent. respectively, whereas the average mortality of children with at least two years' interval amounts only to 11 per [E31]

cent. "At the same time, however, it is observed that the influence of the length of suckling is still greater than that of the length of time elapsing between births. Even with an interval of three or more years, the mortality of children who were insufficiently or not at all breast-fed was above 20 per cent. The children who had been suckled for at least three-quarters of a year were only very slightly influenced by this factor in all groups, except that with a birth interval of less than one year, where the influence of short birth intervals is not counterbalanced even by long extended breast-feeding."

C 66 Figure C 66. "The infant mortality within the families dealt with falls materially and evenly as the average birth intervals lengthen. With an average birth interval of less than one year, one-third of the children die in the first year, but only 7 per cent. where the average birth interval was over three years; but here also the influence is strongly modified by the mode of feeding. With the non-suckling families the mortality is almost 25 per cent., even with a birth interval of more than two years. On the other hand, when the duration of suckling is sufficient, short birth intervals almost disappear (see Table 2), and with an average birth interval of 1¼ to 2 years and a suckling duration of at least half a year the mortality remains on an extremely small scale."

C 67-73 Groth and Hahn have exhibited two large tables C 67 and C 68 and a similar one C 69, the results of their important investigations about breast-feeding and mortality in the administrative districts of Bavaria. Groth shows in Table C 70 "mortality of sucklings in Bavaria," and in Table C 71 "breast-feeding and cancer." In Tables C 72 and C 73 the Groth and Hahn statistics are treated by Dr. A. Bluhm from the point of view of the influence of the habit of breast-feeding on the frequency of births. In connection with Figure C 73 she remarks: "This diagram shows the number of bottle-fed babies in the various Bavarian districts counted at the time of vaccination. To give as correct a picture as possible of the probable influence which the habit of breast-feeding has on the birth-rate (annual number of births per 1,000 of the whole population) there are represented on this figure by green and yellow columns the average birth-rate for the five years, 1875 to 1879, because in that period a record birth-rate was established, so that it may be assumed that there was then no intentional restriction of births. We see within the four 'old Bavarian' districts, where on the average 64.1% of the babies were not breast-fed at all, the number of births is about 4 per 1,000 of the population higher than in the Palatinate and the three 'Frankish' districts, which together only show 18% of non-breast-fed children."

C 72 & 73 "These two figures deal with the influence of the length of suckling on the birth-rate, the [E32] longer the duration of the suckling period, *i.e.*, the higher the number of children breast-fed for six months or more, the lower the birth-rate. This only holds good for the country (Curve B) not for towns (Curve A). This circumstance is explained by the fact that the voluntary restriction of births is much more frequent in towns than in the country, where consequently the influence of the length of the period of suckling on the birth frequency can find much stronger expression than in towns, where, as Curve A shows, it is entirely extinguished by artificial birth preventatives. From both tables it results that, to prevent the senseless waste of human life, the interval between every two births must be more than two years; further, that it is possible to increase it by breast-feeding; the number of births in a district is based in the main on the larger or smaller intervals at which the women of reproductive age have children, and it may, therefore, at the same time, be taken as an expression of these intervals. Keeping these two facts in view, and considering the influence of the mode of infant feeding on infant mortality, it appears to be in the interest of the race that by means of the long duration of breast-feeding, the birth intervals should be extended to at least two years. The facts established in these two tables have a considerable bearing on race-hygiene, especially in reference to the Neomalthusian contentions of the necessary inferiority of the later born, and as a confirmation of the utility of breast-feeding for the reduction of birth frequency. Extremely great appears the influence of breast-feeding on infant mortality."

C 74-78 This importance of breast-feeding is further illustrated by Figure C 74—duration of breast-feeding and infant mortality, after Dietrich; by Figure C 75—average number of carious teeth, after Bunge; and by the three figures, C 76, 77, and 78—"average duration of breast-feeding and physical development, duration of breast-feeding and average school reports, and duration of breast-feeding and frequency of rachitic disturbances of development," after the extensive and valuable researches by Röse.

It must be pointed out that a far more direct connection exists between breast-feeding, duration of suckling, infant mortality and physical development than through the mere provision of suitable nourishment for the child. A good suckling capacity is a symptom of a strong constitution which is transmitted from mother to child. Examination of Röse's table offers this suggestion.

C 79-82 The importance of the hereditary constitution (which he considers is dependent on soil and [E33] climate) as regards infant mortality v. Vogel expresses in four maps of Bavaria (Figures 79-82), so which he has furnished the following comments (contained in the pamphlet, "Der Örtliche Stand der Säuglingsterblichkeit in Bayern," Munich, Piloty and Loehle, 1911): "The district of the highest infant mortality in Bavaria is inhabited by a population of small height, small fitness for military service, and high tuberculous mortality. The reverse holds good on the whole for the district with a low mortality.

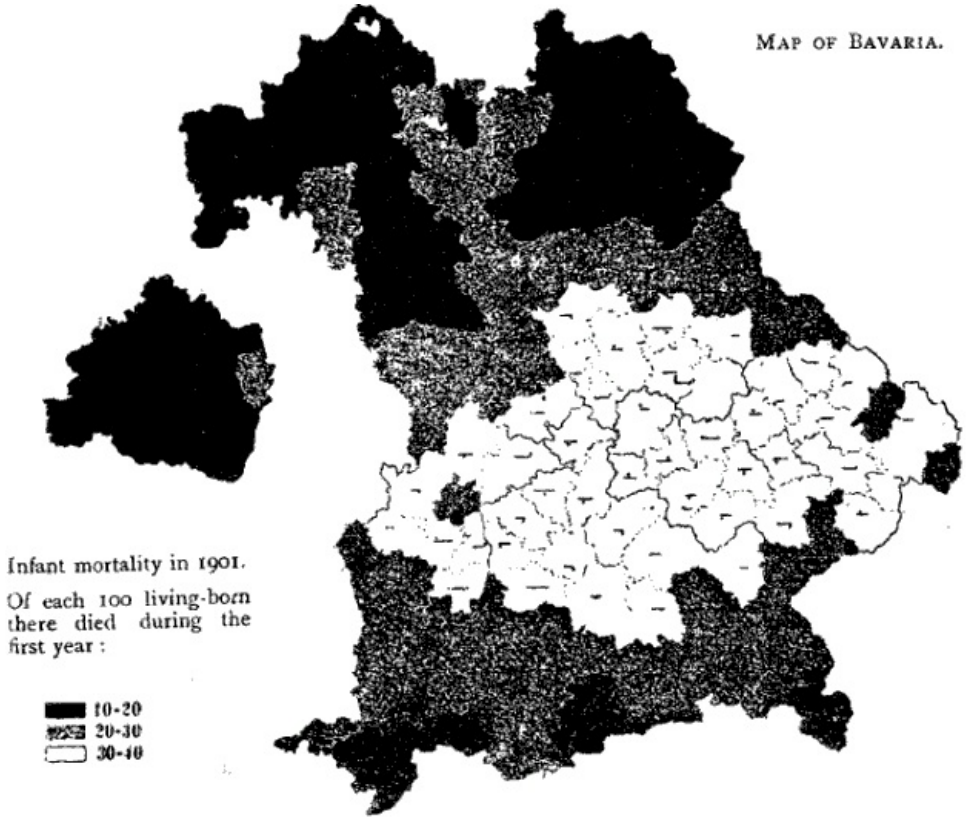


Figure C 79.

I cannot suppress another objection to the usual way of proving the—to my mind undoubted—influence of breast-feeding on the duration of life in infancy. Why is the mortality of those children who have not been suckled for a week so large? Is it because they have not been suckled, or because they have only lived altogether for less than a week? Or, again, to be able to be suckled for 40 or 50 weeks, one must have lived for 40 or 50 weeks, but a child who has lived for 40 or 50 weeks, whether it has been suckled or not, has passed over the worst period. It is [E34] well-known that the mortality in the first days of life is the highest in the second week, much higher than in the third week, and so on. In short, the mortality changes in such an extremely high degree in the course of the first year of life that this period is much too long for the comparison between mortality of suckled and non-suckled children. One ought to calculate how many of those who have been suckled for 0 weeks, one week, two weeks, one month, three months, six months, and so on, have survived the first week, the second week, the first month, and so on. Only in this manner can be established what is the share of the absence of breast-feeding and what is the share of the innate weakness and tendency to disease in the degree of infant mortality."

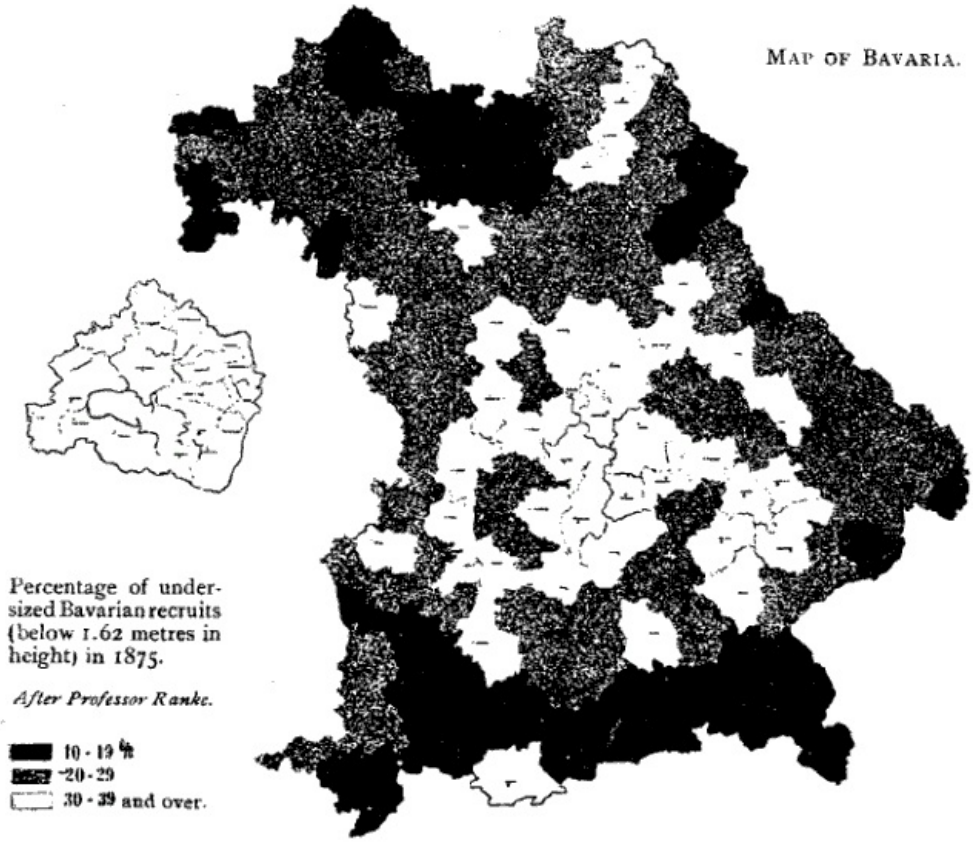


Figure C 80.

[E35]

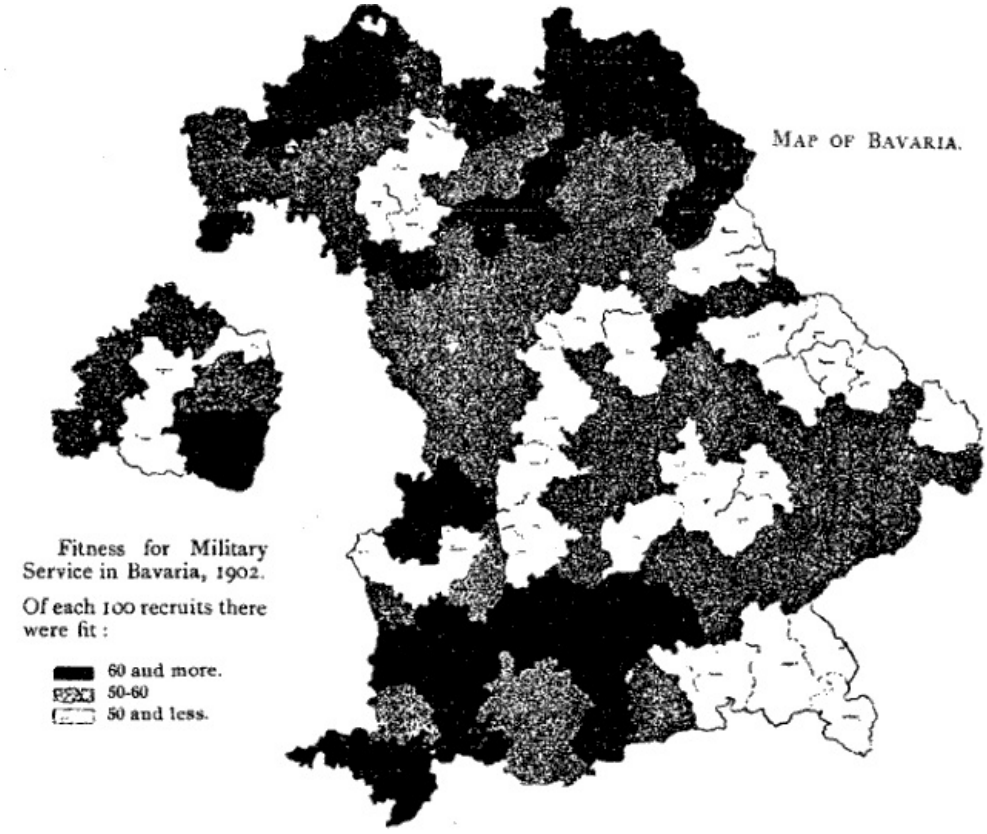


Figure C 81.

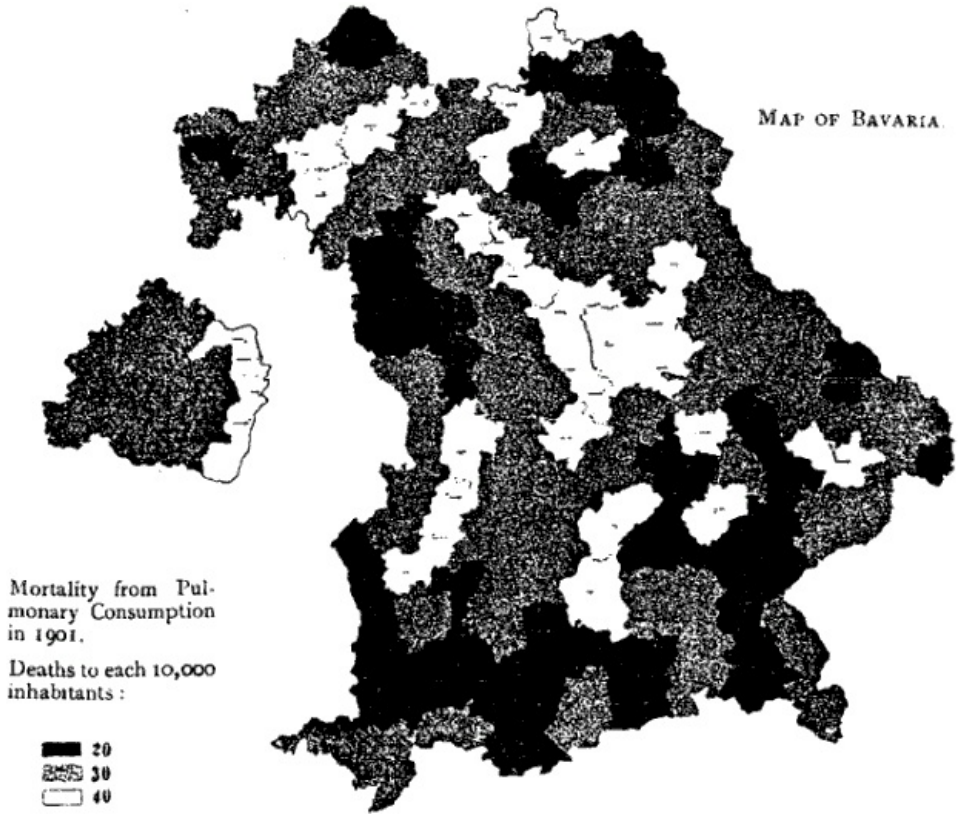


Figure C 82.

C 83 A striking peculiarity of cities, especially large cities, is, as pointed out before, the high mortality amongst men; for this general observation Figure C 83, male and female mortality in town and country, offers an example. Whereas the female mortality in Berlin, in the higher age groups, is even lower than in Mecklenburg with its preponderantly country population—which is evidence that in town life there are no inherent circumstances adversely affecting all persons in a high degree—the male mortality in all the age groups is higher, and in some much higher. The special adverse influence on men of town life is also apparent in the upper part of the figure (comparison of male and female mortality). In Mecklenburg the mortality among men is at most 25% higher than among women, and during the period of most intense child production, as well as in the highest age group, it is even smaller, whereas in Berlin the differences are much more accentuated. It may be remarked that the higher male death-rate in Mecklenburg between the ages of 40 to 75 years can only to a small degree be explained by physiological reasons. This is shown for example by the fact that in the provinces of Schleswig-Holstein, Pomerania, Hanover, Hessen-Nassau, and the Rhein Provinces in the country, the expectation of life for men aged 25 years is about equal to that of women. [E36]

C 84 & 85 The higher male mortality in cities is only partially explained by the specific harmfulness peculiar to men's town occupations, though the mortality of peasants and agricultural labourers ranks amongst the lowest. A very important part in this connection may be played by syphilis. How terribly syphilis injures the body, though it is seldom directly fatal, is shown by the experiences of life insurance companies, of which examples are given in Tables C 84 and C 85. With the Gotha Life Insurance Bank, for instance, the mortality of the syphilitic at the ages of 36 to 50 years was found to be nearly double as high (186%) as that of the non-syphilitic.

C 85 Table C 85 shows to what a high degree the heart and vessels especially are harmed by syphilis. At this point it is to be noted that it may now be considered as proved that the statement that general paralysis causes death in 2.9% cases among the non-syphilitic is erroneous, because general paralysis only occurs among persons who have been affected with syphilis. There is no doubt that the poison of syphilis is also most injurious to the germs and the progeny; the fœtus is sometimes infected in the mother's womb, and sometimes suffers by the general debility of the maternal body. A large proportion also of those children who attain a higher age are either enfeebled or damaged in many ways, and this inferiority is often passed down to the grandchildren. The most recent Serum investigations (the Wasserman reaction) are the first to throw full light on this. In Germany syphilis occurs much more frequently in town than in the country; this no doubt dependent on prostitution and on a much greater degree of promiscuity of sexual intercourse in cities. In the country couples keep together with greater constancy, even in the case of cohabitation without marriage. [E37]

C 86-88 The frequency of syphilis and other venereal diseases in town and country is illustrated in Table C 86, which gives the result of the enquiries of the Prussian Government on the 30th April, 1900, and Table C 87 after Schwiening, on the frequency of sexual diseases among military recruits. Also Table C 88 which gives the frequency of delirium tremens, epilepsy, and general

paralysis in the Prussian lunatic asylums, points in the same direction by the great differences shown in the frequency of general paralysis in the different institutions. This table, at the same time, indicates what is also supported by other observations, that the frequency and intensity of harmful influences through alcohol are much greater in towns than in the country; this may be partly because in cities there is a greater and more regular abuse of alcoholic beverages than in the country, partly because town-life induces a greater susceptibility to alcoholic poisoning than country life (less intense metabolism with sedentary occupations).

C 89-90 Injury to the reproductive function through alcohol. It has been known for a long time that drunkards are frequently sterile. This must be attributed to the fact that the testicles of drunkards become to a great extent atrophied. The condition is shown in Figure C 89 by R. Weichselbaum, [B] representing a section through the testicle of a drunkard. Figure C 90 which shows a section through a normal testicle, enables even the layman to observe the atrophy of the characteristic glandular tissue of the testicle. Weichselbaum has up to now found that in fifty-four cases, without exception, in which alcoholism had been proved, this atrophy could be demonstrated to a greater or less degree. In thirty of these cases the subject was so young that senile atrophy was out of the question. The abuse of alcohol is not the only harmful influence which is able to induce such atrophy of the testicles, but chronic alcoholism acts with special intensity. Very similar results to those of Weichselbaum have been obtained by Bertholet [E38] (Zentralbl. f. allg. Pathologie 20 Bd. 1909) in 37 out of 39 habitual drunkards. They agree with observations on the vesiculae seminales of drunkards by Simmonds, who found that in 61% of the cases examined the spermatozoa were absent or dead. It is a permissible assumption that a poison which can cause the total atrophy of the sexual glands may, in an earlier stage, have adversely influenced in respect to quality the function of those organs.

[B] Verhandlungen der Deutschen Patholog: Gesellschaft, 14th day, Jena, Fischer, 1910, page 234.

C 92 Alcohol and Degeneration, from the tables on the alcohol question by Gruber and Kraepelin, Munich; Lehmann; contains the well-known statistics of Demme, Bunge, and Arrivée. Table C 92 adds to the summary of the statistical observations of Demme, further details of the kind of abnormalities which were observed in children of drunkards. Representing, as they do, exceptionally bad cases with a high degree of degeneration, one may doubt whether and in how far congenital hereditary inferiority of the parents may have had its influence.

C 93 Figure C 93 contains the well-known result of v. Bunge's investigations on the influence of paternal alcoholism on the suckling capacity of the daughters. The varying frequency of the habitual consumption of alcohol and of drunkenness proper of the father in the two groups of families is most striking. Official investigations of this question on a large scale are urgently called for.

C 94 Figure C 94 dealing with the interconnection of tuberculosis, nervous diseases and psychoses of the progeny and the alcohol consumption of the father, is derived from Bunge's investigations. It is worthy of notice that he endeavoured to eliminate from his statistics all families in whom hereditary diseases could be traced previously.

C 95 Table C 95 contains a summary of T. Laitinen's experiments on animals with small quantities of alcohol. The degree of injury to the progeny supposed to be produced by even a minimum quantity of alcohol (corresponding to about one-third of pint of beer for a man) is astounding. Repetition of these experiments on a large scale and with the strictest care would be most desirable here also.

C 96 Table C 96 also refers to reports by T. Laitinen. [C] It deals with the effect of alcohol on the progeny in man. Unfortunately Laitinen's paper is so confused and inexact that it is impossible for the reader safely to draw conclusions from it. His personal observations are mixed up with [E39] those gathered by means of inquiry sheets circulated by him in such a way that one cannot make out how he has arrived at his weights at birth and mortality. Information is lacking with regard to the nutrition of the children, their age at the conclusion of the investigations, the length of marriage, the rapidity of birth sequence and so on. It is, therefore, indispensable to await the more detailed report before Laitinen's information can be made use of.

[C] Internat. Monatschrift z. Erforschung des Alkoholismus, Juli, 1910.

C 97 Bezzola has sent in in a modified form the data which he presented to the Eighth International Congress against Alcoholism in Vienna in 1901, on the effect of acute intoxication on the origin of feeble-mindedness. With their help the curve on Figure C 97 has been constructed, showing the distribution of illegitimate births in Switzerland during the different months of the year from Bezzola's data and the corresponding curve of the births of mentally eminent individuals (taken from Brockhaus' encyclopædia.) The author supplies the following comments:—

"Comparison between the general birth curve and the corresponding one for the birth of feeble-minded children."

The casual observation at the registration of the personal history of feeble-minded individuals that 50 per cent. of the birth dates fall within only fourteen weeks of the year (New Year, carnival, and wine harvest) has aroused the desire to deal with the seasonal incidence of the begetting of the feeble-minded on the basis of as much material as possible. For this purpose the author's census of feeble-minded school children, which took place in the year 1897, and referred to the years 1886-90 inclusive, seemed specially suited. Originally (in 1901) a curve was plotted in which all the 8,186 feeble-minded and idiotic children were included whose exact birthdays were known, and this curve was compared with the total curve for that period. (Schweiz. Statistik 112 Liefg.) The latter was constructed in the following manner from

the whole number of births (934,619) which occurred in these eleven years:—The general daily average was taken as 100, and the daily average for each month was expressed proportionately. Thus numbers above 100 show a daily birth frequency above the average, while for numbers below 100 the reverse is the case. The curve for the 8,136 feeble-minded persons was constructed in a similar way, and thus a comparison with the general population producing them was made possible. Subsequently (1910-11), in order to secure homogeneous material, the first and last years were left out, since by including them, owing to the non-agreement of the school year and the astronomical year, the earlier months (January-April) were much weighted. By this restriction of the material dealt with the number of feeble-minded is reduced to 7,759, but the material for each separate year is more homogeneous. Distributed between 2,922 days (eight years), the daily production of the feeble-minded is 2.648, the corresponding total number of births of the years 1882-89 ls 677,083, or 231.7 per day. 1.14 per cent. of all births are included in the figure for the feeble-minded. If one treats the total number of births for each month as well as the number of births of feeble-minded according to the method described above, and used by the Federal Statistical Bureau, two curves are produced which diverge considerably from each other in particular months. On the whole the curve for the feeble-minded (thick line) is flatter than the curve for the total. Especially striking are the drop in May and June (corresponding to the procreation period [E40] from the 25th July to the 23rd September) and two peaks rising above the "total" curve. One of these is slight, yet distinct. It refers to the months of birth, July and August, corresponding with the procreation period from the 24th September to the 24th November. More conspicuous is the second peak of the curve for the feeble-minded from October to December, otherwise a time poor in births. The centre of the corresponding period of procreation (25th December to 26th March) is in February (carnival). This seems to confirm the suspicion that during the wine harvest and carnival an increased procreation of feeble-minded occurs (procreation during drunkenness?).

We cannot suppress the remark that the fluctuations of the curve for the feeble-minded are much too small to admit of the drawing of an ætiological conclusion, but the fluctuations of the intelligence curve and the illegitimate curve partly exceed the limits of probable error. The peaks of both birth curves in February, correspond to a peak in the procreation curve in May. Perhaps one may attribute them to the existence of a remnant of a period of "heat" (or a rutting season) in man.

C 98 Lead. Whereas the germ cells are well protected against many harmful influences from without which affect the soma of the mother, they and the fœtus produced from them suffer considerably from some. Amongst their deadliest enemies are certain poisons, and notorious in this respect is lead. Table C 98 gives two sets of statistics on this point, they justify the law in Germany, and in other States, forbidding female labour to deal with lead and lead-containing materials. Paul's figures, showing that lead poisoning of the father is also extremely adverse to the production of a healthy progeny, are remarkable.

C 99 Female Labour. A baneful influence on reproduction is brought to bear by the growing quantity of professional female labour away from home and by the economic emancipation of women. Evidence of this is given in Table C 99—"female labour and child mortality"—the data of which are taken from Prinzing's work. Infant mortality is higher the larger the percentage of females employed in factories during the child-bearing period. This is partly due to interference with breast-feeding and partly to the unfavourable influence on pregnancy.

C 100 Dr. Agnes Bluhm has given in Figure C 100 "Female Labour and Reproductive Activity," the statistics of Roger and Thiraux, as well as the results of the investigation of the Imperial Statistical Office on the "Relationship of illness and deaths in the Local Invalidity Fund for Leipzig and surroundings." Dr. Bluhm gives the following explanation: "The top figure on the left is based on material of the Local Invalidity Fund for Leipzig and surroundings, dealing with over [E41] a quarter of a million of women of child-bearing age. The distinction between obligatory and voluntary members makes possible the estimate of the influence of work continued up to the time of confinement, because the voluntary members receive the same weekly payments during confinement as the obligatory ones, and, consequently, a woman has no object in joining the voluntary insurance scheme except in order to secure rest before confinement, which they procure for themselves at their own expense and with the loss of their wages. (At that time the compulsory support during time of pregnancy did not exist.) It is to be noted that the voluntary members show ten times as many confinements as the obligatory ones."

"The left hand figure at the top shows that the women who work up to the time of confinement fall ill during their pregnancy twice as often, and have six or seven times as many miscarriages and premature births and 1.28 times as many cases of death in child-bed, as those who stop work for a more or less extended period previous to their delivery."

"The frequency of illness after childbirth is in both categories of women almost the same; but the duration of the illness beyond the period for which the legal subvention provides (13, 26, or 34 weeks respectively) is much greater in the case of the obligatory members who do not spare themselves before their delivery."

"Left hand figure at the bottom—the researches were made by Roger and Thiraux in a maternity home. A comparison is made between the women who entered the home only at the beginning of childbirth and those who entered during the last month of pregnancy or sooner. Premature birth occurs in nearly one-third of the cases among the former, but among the latter only one-eighth.

"Right hand figure at the bottom—dealing with the same material as the left hand figure below compares the weight at birth of the first, second and later born. The average weight of the former is 300 g. and that of the latter 341 g. higher with mothers who cease work two or three months before delivery, than with those who worked up to the last. Possibly this expresses in the main the different duration of pregnancy. The importance of the birth weight of a child for its further development is not to be underrated."

"The top figure on the right shows that the importance of the adverse influence of female labour on the race, shown in the above figures, is growing, because there is an increase of employment amongst married women. Simon's figures show that the manufacturing industries, which in 1907 employed by themselves two million female hands, the number of married women has increased by almost 200,000 during the last twelve years. In agriculture, in which four and a [E42] half million females find their main occupation, the share of the married women is much greater still."

"The increase of married female labour being intimately connected with the development of our economic life, which cannot be deliberately influenced, the demand for a Motherhood Insurance for all female labourers of any kind, and for the extension of the legal time of stoppage of work before childbirth to at least four weeks, follows as a practical result of the facts stated above."

Dr. Bluhm's repeated assertion, which is regarded by many as a dogma, that economic conditions cannot be deliberately influenced (i.e., that they are of the character of a law of nature) must not remain uncontradicted as a principal. It is absolutely unproved, though the difficulty of influencing our economic life cannot be denied; the economic order has been created by man and must be altered if it proves harmful for the race.

C 101 The adverse influence of female labour on the progeny is shown from a somewhat different point of view in Table C 101—"premature births and abortions in different callings." The most serious fact shown here is that a low birth rate may frequently be found in conjunction with a high rate for miscarriage and premature birth; as the compiler of these statistics points out, this conjunction is most apparent in those callings which demand frequent intercourse with the public, such as domestic service, that is to say in cases where pregnancy is particularly inconvenient. Probably in these cases artificial prevention of pregnancy goes hand in hand with the procuring of abortion!

Race-hygiene does not aim at an indiscriminate motherhood insurance of married and unmarried mothers, but it aims at the economic subvention and encouragement of legitimate fertility of healthy and able parents, connected with, and rendered possible by, a reduction of female labour away from the home. Marriage is one of the most important hygienic institutions for the individual as well as for the race, and it is folly to allow its decay and to replace it by substitutes.

C 102 The importance of marriage for the health to married persons is shown by figure C 102 —"condition with regard to marriage and mortality in Prussia, 1894-97," as given in Prinzing's book. That we have to deal here with an actual favourable influence of marriage, and not with a selection of the healthy at the time of marriage, is proved by the fact that the low death rate of the married is maintained through all age classes and that the widowed and divorced show throughout the highest death rate.

C 103 "Condition with regard to marriage and mortality, cases of death from tuberculosis," after [E43] Weinberg, also confirms with regard to tuberculosis the favourable influence of marriage on the health of men. With women the mortality from tuberculosis up to the age of 60 is lowest among the unmarried. Pregnancy and suckling act here adversely, but by far the worst position is also held here by widows and divorced women.

C 104-105 The advantage of marriage for the progeny is made evident in Figure C 104—"mortality of illegitimate children in different European states", and in Figure C 105 dealing with the "survival of the legitimate and illegitimate children in Berlin in 1885." After five years there are still alive more than 60% of the legitimate, but only 40% of the illegitimate children. The higher mortality of the latter is by no means a purifying process of weeding, but the expression of greater sickliness which permanently harms the surviving also. The division of labour between man and wife, with reference to the care of the offspring, is one of Nature's institutions which is of the greatest advantage for parents as well as children.

C 106-107 Inbreeding and the Crossing of Races. On the whole with mankind inbreeding is viewed with fear, and justly so, in view of our customary carelessness with regard to the physical and mental conditions of those who contract marriage. If blood relations have similar pathological conditions or pre-dispositions to illness or degeneracy, the progeny which results from their union is endangered to a particularly high degree. Our collection brings as an example of this in Table C 106—the pedigree of the celebrated Don Carlos. The bad inheritance of Johanna the Mad asserts itself to a lesser degree yet quite perceptibly also in the children of Max. II. Table C 107—the children of Maximilian and his cousin Maria of Spain; undoubtedly the Emperor Rudolf II. was mentally diseased. Also Charles V. and his son Philip II. were abnormal characters.

C 108 Blood relationship of the parents and health of the children, which v. d. Velden has prepared from Riffel's family tables, also speaks for the harmfulness of inbreeding. The offspring of blood relations are emphatically weaker and sicklier than those of persons related distantly or not at all.

C 109 The harm of inbreeding amongst the pathological is also illustrated by the large Table 222 (exhibited by Schüle). Pedigrees from wine-growing districts in the centre of Baden; against this it may be taken as proved that inbreeding in itself between the healthy and fit is not harmful. Animal breeders (as well as plant cultivators) make an extensive use of it with the view to the [E44] cultivation of certain hereditary characteristics.

C 110 We show in Table C 110, after de Chapeaurouge, the pedigree of Belvidere, an animal which, in spite of close inbreeding, was distinguished by excellent qualities, and by whom, out of his own daughter, another sire of the highest rank was produced.

C 111 After long-continued and very close inbreeding, even with a faultless condition of the germ plasm, the decrease of vitality and fertility of the progeny asserts itself. Important evidence for this is given by Georg. H. Shull in his exhibition of cross-fertilized, self-fertilized and hybridized maize (Exhibit No. C 111). Shull makes the following comments: "Results of inbreeding with maize—crossing between different races or genotypes, if not too distantly related, results in a progeny which excels its parents in vitality, whereas crosses between individuals belonging to the same genotype engender no increase of vitality as compared with the parents."

In maize, and presumably in most other plants and animals in which cross-fertilization is the rule, all individuals are usually complicated hybrids between different varieties of genotype. They owe their vigorous constitution to this hybrid nature.

"The result of self-fertilization or of close inbreeding is that the hybrid nature diminishes in degree. The stock is reduced to a homozygotic condition, and is thus deprived of the stimulus which lies in the hybrid condition."

"When two given genotypes are crossed, the first hybrid generation is possessed of the greatest vigour. Even the second generation shows much less vitality, and this decrease continues with the third and later generations. But each succeeding generation differs less from its predecessor than the latter differed from its own parents. As soon as the stock has become a pure line, inbreeding produces no further weakening."

"The top row of the exhibited collection of maize cobs (large cobs with many grains) is derived from a family in which for five generations self-fertilization has been prevented by using mixed pollen. These conditions approach those prevailing in an ordinary field."

"The middle row of maize cobs (small cobs with few grains) comes from families of the same derivation as the first row; but for five generations they have been self-fertilized. Each one has characters which the others do not possess. They are almost pure bred, and continued self-fertilization produces no further adverse influence. The cob, quite to the right, without grains, has pistils so short that they do not project from the husks. This genotype must, therefore, be [E45] fertilized artificially."

"The lowest row (the largest cobs with the most grains) comes from families which have been created by the crossing of plants belonging to different genotypes, the relationship in which case is indicated by the lines which connect this row with the middle row."

"The following harvests of grain were made in the year 1910:—

Self-fertilization prevented (average of nine families)	53.5 hi pro ha.
Self-fertilized (average of ten families)	25.3 " " "
F1 hybrid (average of six families)	59.2 " " "
F2 hybrid (average of seven families)	38.8 " " "

C 112-114 It is well-known to what degree inbreeding is practised in reigning families. We show as an example for this, Chart C 112, the pedigree of the Archduchess Maria de los Dolores of Tuscany, exhibited by Dr. Stephan Kekule von Stradonitz, and Chart C 113 of the same exhibitor, pedigree of Ptolemäus X. Soter II. (Lathros), and Chart C 114, pedigree of the celebrated Cleopatra. Though with Ptolemäus X. the effect of sexual reproduction in bringing about new combinations of hereditary units was very limited, since the couple, Ptolemäus V. Epiphanes and Cleopatra Syra having produced all the germ cells from which he developed, he appears, nevertheless, to have been a perfectly normal being. In his granddaughter Cleopatra certainly much "extraneous blood" circulated.

C 115 Even where there is no high degree of inbreeding, the individuals of a people are much more closely related to each other than is generally assumed. Table C 115, "theoretical number of ancestors," shows that, assuming the duration of one generation to be 35 years, and that no marriages between relations have taken place, the number of the ancestors of a man living now would have been eighteen billions in the year 0 A.D. In reality the germanic race, wandering west, probably only numbered hundreds of thousands. This phenomenon of "ancestral loss," as Ottokar Lorenz calls it (that the number of real ancestors is much smaller than those theoretically possible), can be illustrated in the pedigrees of the reigning houses.

C 116 We have in Table C 116 an analysis of pedigree of Emperor William II., after Ottokar Lorenz. Investigations show that twelve generations back the real number of his ancestors amounts to only one-eighth of the possible figure. Only 275 persons have actually been found because in the older lines, the bourgeois element, of which no record can be found, has had a very large share.

C 117 Very little knowledge exists concerning the effect of the crossing of races in man. On the [E46] whole it appears not to be favourable, if it is a question of crossing of races from far apart, even in purely physical respects. An example of harmful influence is given in v. d. Velden's Table C 117 —"Fertility and Health in relation to the crossings of races."

NEOMALTHUSIANISM.

C 118-122 The next and the greatest concern of race-hygiene—much greater than the relative increase of inferiority—is, to-day, neomalthusianism, the intentional restriction of the number of births in varying degrees up to complete unproductiveness. Though conscious regulation of the production of children is absolutely necessary, it becomes fatal to a nation if under no control but the egotism of the individual. For its permanent prosperity a nation requires, in order merely to hold its own, a sufficient number of "hands" and a sufficient number of "heads" to guide those "hands." We referred to this when mention was made of sterility as a phenomenon of degeneration, but this cause of sterility during the last decades only takes a second place compared to deliberate intention. The wealthy and higher social classes were first attacked by neomalthusianism. Their progeny is becoming more and more utterly insufficient, so that under our present social conditions, particularly which give mind and talent better openings, and thereby more and more take out of the mass of the people the better elements, make the strongest demand for them and use them up, the danger of an increasing deterioration of the average quality of its progeny grows greater and greater. The baneful influence of wealth on fertility is shown by several tables. Figure C 118 "Fertility and Wealth," after Goldstein and Tallquist, gives the condition in the French Departments; Figure C 119, "Number of Children and Wealth," after Bertillon, for the Arrondissements of Paris; Figure C 120, "Fertility and Wealth," after Mombert, for Münich, 1901, Table C 121, "The Number of Children in Families of Different Classes in Denmark, 1901," after Westergaard; Table C 122, "Fertility of Marriages, Occupation, and Wealth for Copenhagen, and Dutch Conditions," after Rubin, Westergaard, and Verrijn Stuart.

C 123 The worst condition with regard to the fertility prevails among those with the highest mental endowment. Evidence of this is given in Figure C 123, "Insufficient Fertility of the Highly Endowed in Holland," after J. R. Steinmetz. It shows the rapidity with which the number of children decreases. In order to estimate the significance of these statistics, it must be noted that [E47] after taking into account the mortality among children and young persons, and the unfitness for parenthood of an appreciable fraction of the adults, a fully capable couple would have to produce at least four children to assure the necessary moderate increase in the population which is required to prevent a people from sinking into stagnation and deterioration.

C 124 The dying out of highly gifted families is shown to be more accentuated in Figure 255, after Bertillon, "Progeny of the Highly Gifted in France." Four hundred and forty-five of the best known Frenchmen, with their wives, have not even reproduced that number of individuals, and this in spite of the fact that repeated marriages of the same individuals have not been taken into account.

C 125-126 Even if one has been able, up to the present, to live in the hope that the number of persons of more than average ability produced by the mass of the people is always sufficient to replace those that are used up, at the present time anxiety about the "heads" is replaced by anxiety about the "hands." The knowledge of means of preventing fertilization spreads incessantly, and is recklessly promulgated by the neomalthusians and by a shameless industry. We point to Figure C 125, "Want of Fertility in French Towns," after Jayle, and to Figure C 126, "Fertility in Prussia." In Berlin fertility is decreasing most rapidly; at the end of the sixties it still amounted to 200 in every 1,000 women of child-bearing age. In the five years, 1905-1910, only to 84; in the year 1910 only to 74. This state of things is shown also in the relative increase in numbers of the first born.

C 127, 128 & 129 Figure C 127, "Decrease of Legitimate Fertility in Berlin—the two-children system." The other German towns follow the example of Berlin. Berlin to-day produces 20% less children than are required to maintain its own population without immigration, and the same conditions will soon prevail in other towns. Up to now the country districts in general maintain their fertility (West Prussia on Figure C 128), but there, too, modern practices begin to make themselves felt. The town and industrial population increases so rapidly that the conditions prevailing among them have an ever increasing effect on the people as a whole. Thus we see, even at the present time, a serious decline in fertility among an overwhelming majority of European States: Figure C 129, "Decrease of Fertility in Some European States."

[E48]

D

Exhibited by David Fairchild Weeks, M.D.,

Director of the New Jersey State Village for Epileptics at Skillman, U.S.A.

Explanation of Symbols used in the Charts.

Male individuals are indicated by squares and females by circles. The members of each fraternity are connected by the same horizontal line. The fraternity line is connected by a vertical line to the line joining the symbols representing the father and mother. Illegal unions and illegitimate children are shown by dotted lines. As an aid in tracing the patient's immediate family, a green line is used to connect the direct ancestors on the paternal side, and a red line on the maternal side. The red squares and circles indicate epileptics, the green the insane, the black

the feeble-minded, and purple the criminalistic. The figures directly above the fraternity line indicate the rank in birth, a figure inside a square or circle shows the number of individuals of that sex. A black dot suspended from the fraternity line stands for a miscarriage or a stillbirth. A line underneath a square or circle shows that institutional care has been received. The hand points out our patient.

The following letters indicate the different conditions: A, alcoholic; B, blind; C, criminalistic; D, deaf; E, epileptic; F, feeble-minded; I, insane; M, migrainous; N, normal; P, paralytic; S, syphilitic; T, tubercular; W, wanderer, tramp; d, died; b, born; inf, infancy; Sx, unchaste.

D 1 This chart shows very clearly the dangerous results of a marriage in which both of the parents are epileptic. Of the four children the first three were epileptic, and the fourth, a boy, who died at the age of nine, was feeble-minded. All four of these children were cared for at public expense, two are patients at the New Jersey State Village for Epileptics, and the other two were wards of the Children's Home Finding Society. The epileptic father is dead, and the mother married again to an alcoholic man. When last heard of she had another child.

D 2 An epileptic woman, married to a feeble-minded man, is responsible for the large number of defectives shown on this chart. The principal mating is that of one of the epileptic daughters of this woman, who, like her mother, married a feeble-minded man. Eight children resulted from this marriage; one died before two years of age, the other seven were epileptic, the five who are living are patients at the New Jersey State Village. Two of the girls in this fraternity had [E49] illegitimate children before receiving proper care. This family is undoubtedly a branch of a family of defectives, most of whom live in an adjoining State.

D 3 This is a case of incest, and shows plainly that the "empty germ plasm can yield only emptiness." These people lived in a hut in the woods. The feeble-minded man had by his defective sister an epileptic daughter, then by this daughter he had four children, one an epileptic, one a feeble-minded woman of the streets, who spends much of her time in jail, one an anencephalic monster who died soon after birth, and one a feeble-minded boy, who did not grow to manhood. Since the hut in the woods burned down, the epileptic woman and feeble-minded daughter live in a cellar in town, though much of their time is spent in jail.

D 4 This chart shows a feeble-minded man, who came from a feeble-minded family, married to an epileptic woman, who descended from a tubercular epileptic father and a mother who is described as "flighty," "not too bright." This couple had six children, three feeble-minded, two epileptic, and one still-born. Since the death of the epileptic mother, the father has secured homes in institutions for all of his children except one, and then married again. As yet he has no children by the second wife.

D 5 The wife in the central mating in this case is a low grade epileptic, who can scarcely recognize her own children. The father is a feeble-minded alcoholic, who works hard, but who spends all his money for drink. There were six children; one died at the age of four, and all of the others except one six-year-old boy are epileptic. All are being cared for by the public. Before the mother and three of the epileptic children were brought to the State Village for Epileptics the family lived in a cellar, slept on rags, and depended on the neighbours for food.

D 6 This is a history which illustrates very well the source of a large number of the almshouse inmates. The central figure is an epileptic woman, who spent most of her life in the poor house. No two of her seven children are by the same father. The epileptic daughter, whose father was feeble-minded, had started to lead the same kind of life as her mother; in the almshouse she gave birth to one illegitimate child before she was put under State care. The mother, when she last left the almshouse, went to live in a hut in the woods with a feeble-minded man, who had three feeble-minded sons; one of these sons married the feeble-minded sister of one of the epileptic patients at the New Jersey State Village.

D 7a, b This is the history of two patients who have been found to be related, the great grandfather of [E50] the one was the brother of the grandmother of the other. The principal mating under D 7a is that of a feeble-minded man married to an epileptic woman, whose mother died in the insane asylum. They had six children, the first died when only a few months old, the next and the fourth were not bright and died young, the third is an epileptic, the fifth is feeble-minded and criminalistic and he is now at the State Home for Boys, the sixth is also feeble-minded and cared for at an industrial home for children. The mother and father, at one time inmates of the almshouse, are now supported by the town. Under D 7b the father, who died of spinal meningitis, was migrainous and had many epileptic relatives, the mother is neurotic. There were four children, the first an epileptic, the second died at 20 of spinal meningitis, the third is of a very nervous temperament, the last, a girl of 16, seems to be normal.

D 8 Both of the parents in this case are feeble-minded. The father was the black sheep of his family, his brothers are intelligent men, and for the most part good citizens; the mother, however, was the illegitimate child of a feeble-minded woman. There were seven children, one an epileptic, the others all feeble-minded with the exception of the sixth, who is now about 11 years old; she was taken from her home and put with a very good family; she shows the effect of the changed environment, and though not up to her grade in school, is only slightly backward. There is some doubt about the parentage of the child, and it is very probable that she is by a different father. Since the father's death the mother has had one illegitimate child; her children were taken away from her except the two oldest because of the immoral conditions in the home, and she now claims to be married to a feeble-minded man, who is the younger feeble-minded brother

of her imbecile daughter's husband.

D 9 The central mating in this case is that of an epileptic, alcoholic, sexually immoral man, married to a neurotic and sexually immoral woman, who has many insane and feeble-minded relatives. They had in all ten children; two were epileptic, three, feeble-minded, one criminalistic and sexually immoral, the sixth is the only one who has a good reputation, the last was a stillbirth. The father and mother are no longer living together.

D 10 The case illustrated on this chart is of a feeble-minded woman married to an alcoholic man. The wife descended from an alcoholic father, who had several epileptic relatives. The husband also descended from an alcoholic father, and had an epileptic nephew. Of their nine children, the [E51] first three died young of scarlet fever, the fourth was epileptic, and the other five are feeble-minded.

D 11 On this chart we have the history of an epileptic man whose attacks were of the petit-mal type. He married a choreic woman. They had four children, the eldest a man who developed epilepsy after his second marriage. His first wife was insane; by her he had two daughters, one of whom is now an inmate in an insane asylum, the other is neurotic and has been treated in a sanatorium. Of the other children two are apparently normal and one migrainous.

D 12 This chart shows an epileptic man married to a normal woman; he had both epileptic and insane relatives, while she had epileptic, alcoholic, and tubercular relatives. Their first child was an epileptic, the next were twins, one of these appears to be normal while the other is of a very nervous temperament, the fourth died in infancy, and the last three were stillbirths. The mother married the second time, this time to a man who drank to excess after their marriage; by him she had two children, both of whom seem to be normal. They are both in school.

D 13 This is the history of a low grade epileptic. His oldest sister is normal; she was brought up by strangers after her mother's death, and is now earning her living as a saleslady. The second was a boy, who was thought to be normal until he was about sixteen, when he displayed criminalistic tendencies, and for the crime of rape was put in the Reform School. The youngest is a girl, who is of a very nervous temperament. The father was an alcoholic, and went on long sprees; he deserted his wife and family to live with a woman who also deserted a family. His brother is an alcoholic, and married the patient's mother's sister; they are now divorced. The mother was migrainous, she died of tuberculosis; her family shows a neurotic taint, while the father has several epileptic relatives.

D 14 In the central mating the father and mother are both migrainous. They both belong to families prominent in the community in which they reside; their homes are among the best, and they are counted as leading citizens. There were nine children; three died before four years of age, one is epileptic, one seems to be normal, and the others all show some nervous taint, though not migrainous.

D 15 This is the history of a syphilitic and a sexually immoral couple. They were never married, and the woman for many years supported the man, who was never sober and frequently had attacks of delirium tremens. She finally deserted him. Of their eight children two were stillbirths, three [E52] were epileptic, and the other syphilitic. One of the epileptics in a jealous rage shot the woman whom he loved, and when he found that escape was impossible, killed himself.

D 15a-b Charts explaining the method of collecting and recording data.

E

Exhibited by Mr E. J. Lidbetter.

A selection by Mr. E. J. Lidbetter, from his collection of pedigrees, showing pauperism in association with mental and physical defect, justifying the inference that a high proportion of pauperism is to be attributed to the transmission of defect and the perpetuation of stocks of a low type:—

E 1 Pedigree showing mental disease and destructive eye-disease in the same stock. Insanity, epilepsy, feeble-mindedness and idiocy in various degrees in twelve members, several of them being also blind; partial or total blindness from detachment of the retina without mental defect in several others. Tendency to "anti-dating" or "anticipation" of the mental disease in succeeding generations or younger born offspring. The printed numbers on the diagram indicate the age of the individual on 1st attack. Prevalence of tuberculosis (three members). Neither mental nor ocular conditions attributable to syphilis. Of the 49 individuals whose history is known 26 have been, or are being, maintained in public institutions (Asylums, Workhouses, Blind Schools, or Poor Law Schools), 29 have been paupers at intervals, and two are known to have been in prison. Several marriages between mental defectives yielding large but inferior families. (Exhibited by Mr. E. T. Lidbetter. The eye-disease reported upon by Mr. E. Nettleship.)

E 2 Pedigree showing the tendency to intermarry among pauper and defective families. On the left "able-bodied" pauperism and on the right sickness. One hundred and fifty-seven units shown in five generations; 76 paupers shown, including 38 classed as chronic, 32 occasional and six medical only. Twenty-eight died in infancy, nine tuberculous, six insane, two epileptics, and one blind. Shows also pauper children born in lucid intervals of parent suffering from periodic

insanity.

E 3 Pedigree illustrating stock of a low type in which very little physical defect appears. The total includes 61 individuals, of whom 42 are or have been paupers, eight have died in workhouse or infirmary, and two in asylums for lunatics; one child is an imbecile. On the whole the stock may be described as mentally sub-normal (not strongly so), but with a marked non-moral tendency. Of the 34 children in the last generation, ten are certainly illegitimate; 15 were, or are, being brought up in Poor Law Institutions, and nine received out-door relief with their parents. The collective period of pauperism in this case exceeds 115 years and the cost to the ratepayers is estimated at about £2,400. [E53]

E 4 Showing the case of a woman who had two husbands. With the first her children were consistently defective (deaf and dumb). With the second, one died in infancy and three are doing well. All the children of the first are, or have been, paupers.

E 5 A series showing the intimate relation between tuberculosis infant mortality and pauperism:—

E 5a Showing a tuberculous family with apparently normal parents, both of whom come from tuberculous stocks. Of their 14 children only two are normal; six are consumptive; four died in infancy. The father was one of a family of 8 of whom only he and one other survived—and that other became insane, and his wife and children became paupers in consequence.

E 5b Showing insanity, consumption and infant mortality; also the transmission of insanity through the apparently normal.

E 5c Showing the survival of tuberculous stock by accession of strength from the normal. Only the illegitimate children and their non-sick father survive in this group.

E 5d Showing the case of a normal woman who had two consumptive husbands. Survival of defective strain by accession of strength from the normal.

E 5e Consumption in three generations. Male infant mortality. Query, transmission (?) through the normal.

E 6 A series showing transmission of mental defect through the apparently normal.

E 6a Insanity, blindness, epilepsy and feeble-mindedness.

E 6b Insanity in three generations. Transmission through the normal in each case.

E 6c Insanity through the normal twice removed.

E 6d Insanity, epilepsy, and infant mortality—a Mendelian suggestion.

[E54]

F

EXHIBITED BY PUBLIC HEALTH DEPARTMENT, CITY OF LIVERPOOL.

E. W. Hope, M.D., M.O.H.

F 1 One large model of insanitary property dealt with in Liverpool, built to scale, etc., with glass cover.

F 2 Charts showing the decline in mortality from phthisis:—

F 2a One showing rate for England and Wales.

F 2b One " " England and Ireland.

F 2c One " " Scotland.

F 2d One " " Liverpool.

F 3 b c d e f Six framed and glazed photographs illustrating insanitary property which has been demolished in Liverpool, and the new dwellings which have been erected to house the dispossessed tenants.

G

AN EXHIBIT OF A SYSTEM OF MAKING PEDIGREE RECORDS.

Exhibited by Dr. Raymond Pearl,
Biologist of the Maine Agricultural Experiment Station, Orono, Maine.

This exhibit consists of a series of blank record forms designed to illustrate the method of

keeping pedigree records which has been in use at the Maine Agricultural Experiment Station for a period of five years, in connection with its work in the experimental study of inheritance in poultry and in various plants. The advantages which have been found by experience to inhere in this system of pedigree record keeping are (*a*) simplicity; (*b*) ease of operation; (*c*) small chance for error in the keeping of large masses of pedigree records; (*d*) uniformity of the system, such that records of all kinds, in any way pertaining to the work, may be brought together with great ease for consultation or study.

In addition to the record blanks there are exhibited also various marking devices and other apparatus connected with the proper working of the plan.

It should be noted that while the blanks here exhibited are devised particularly for work with poultry and plants, the same system, with slight modifications, may be successfully applied to the keeping of human pedigree records; indeed it is a pleasure to state that the system here [E55] exhibited is an outgrowth and development of a scheme for the keeping of pedigree data in general and particularly human pedigree records suggested many years ago by the late Sir Francis Galton.

H

Exhibited by C. V. Drysdale, Esq., D. Sc.

The Malthusian theory of population leads to the conclusion that the population of the majority of countries is held in check by lack of food. Therefore, there should be a correspondence between the birth and death rates, high birth rates producing high death rates and high infantile mortality, and the death rate should rise or fall with a rise or fall of the birth rate.

In the accompanying diagrams, white strips imply birth rates, shaded strips death rates, and black strips infantile mortality, or deaths of children under one year.

[E56]

H 1 Shows the relation between birth and death rates and infantile mortality in various countries in 1901-1905.

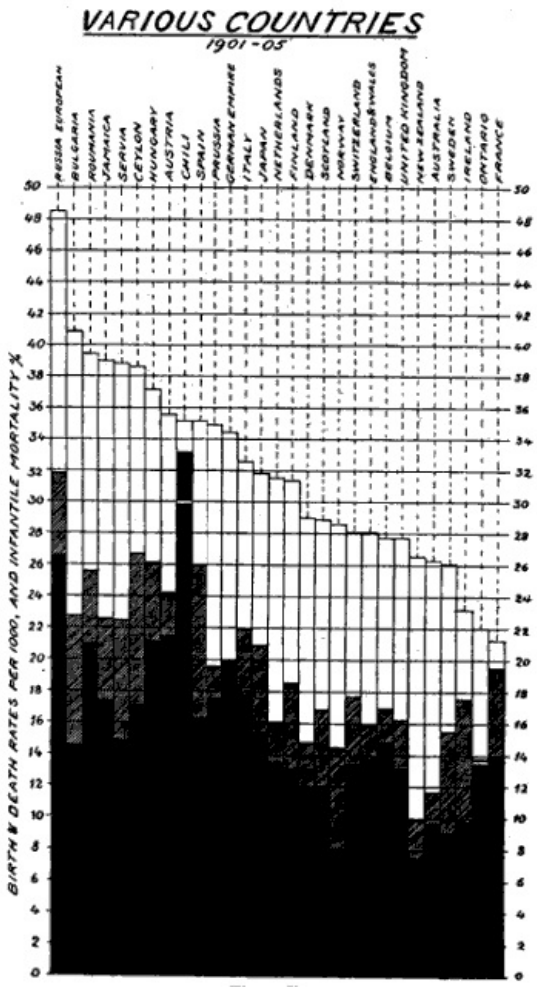


Figure H 1.

H 2 Relation between *birth rate and corrected death rates* in various countries. (This shows that France is healthier than appears in H 1.)

H 3 Shows relation between birth and death rates from various causes in five districts of London. [E57]

H 4 Relation between the birth rate and death rate for various arrondissements of Paris in 1906. (Note that the increase in the Elysée quarter is as high as the average in the quarters of high birth rate.)

H 5-6 Variation of the total population and birth and death rates in the United Kingdom and the German Empire. (Note that the fall in the death rate corresponds fairly closely to that in the birth rate.)

H 7 Id. for France. (Note that the population is still increasing although slowly.)

H 8 **Birth and death rates for France** since 1781. (Note that the rate of increase of population in 1781 was no higher with a birth rate of 39 per 1,000 than in 1901-6 with a birth rate of only 21 per 1,000. A fall of 17.8 per 1,000 in the birth rate has resulted in a fall of 17.5 per 1,000 in the death rate.)

H 9 Birth and death rates and infantile mortality for England and Wales. Also marriage rate, fertility of married women, illegitimacy and variation of diseases. (Note that the illegitimate birth rate has fallen to half since the fall of the birth rate set in.)

H 10 Birth and death rates and infantile mortality in the Netherlands (Notice the rapid increase of population as the death rate falls, and the great fall of infantile mortality, probably due to the practical work of the Dutch Neo-Malthusian League among the poor.)

H 11-13 *Protestant Countries.* (Notice the correspondence between the birth and death rates and infantile mortality in all.)

H 14-16 *Roman Catholic Countries.* (Note that the fall of the birth rate has taken place almost equally with that in the Protestant Countries, and with the same result.)

H 17-20 The only four countries in which the birth rate is approximately *stationary*. (Notice that the death rate has not fallen—except, perhaps in Russia—and that the infantile mortality has not fallen. Also that the highest birth rate produces the highest death rate and infantile mortality, and the lowest birth rate the lowest mortality.)

H 21-24 The only four countries with *rising* birth rates. *The death rate and the infantile mortality have increased in every one.*

H 25 *Australia.* The death rate has fallen with the birth rate, and is now only about 10 per 1,000. [E58]

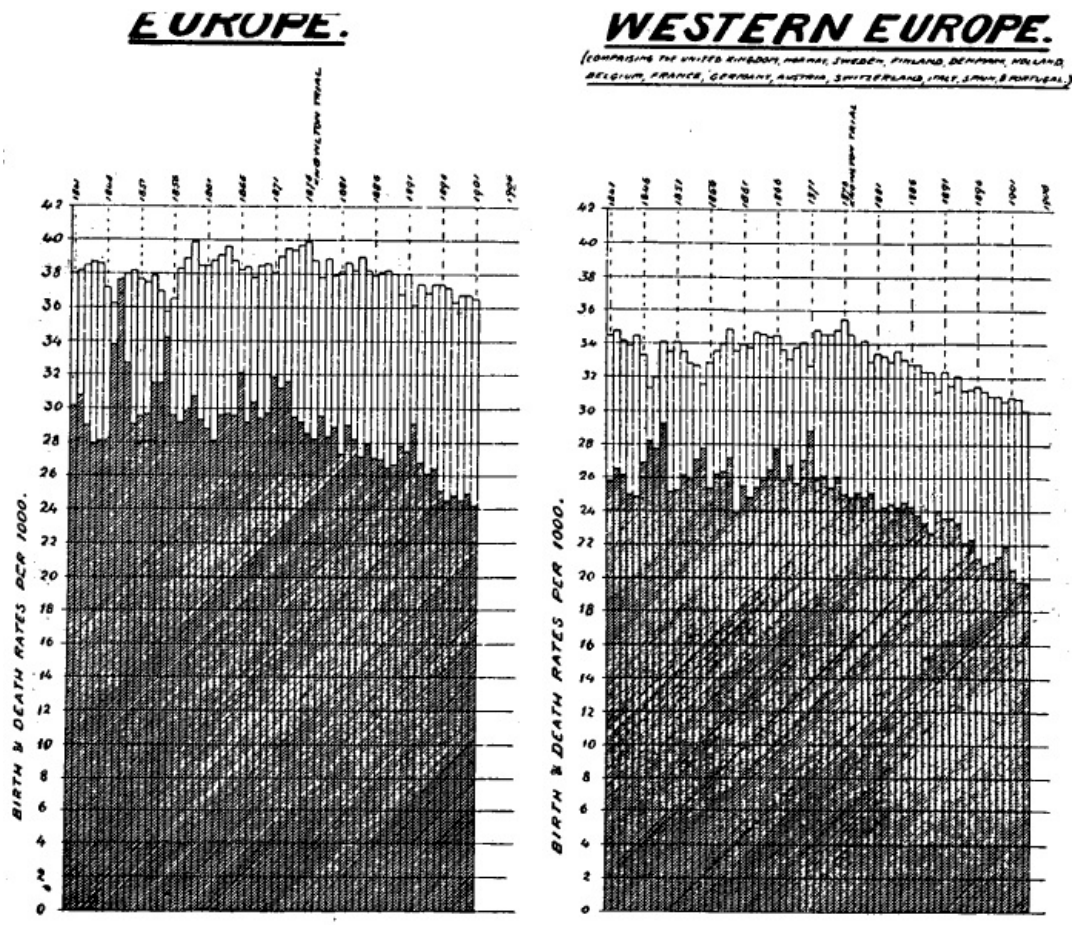
H 26 *New Zealand.* The only country in which the fall in the birth rate has not produced a fall in the death rate, and which is not therefore over-populated. The infantile mortality is the lowest in the world, and the death rate less than 10 per 1,000, which gives us an ideal which we can reach in all countries by lowering the birth rate sufficiently.

H 27 *The City of Toronto.* The birth rate has fallen and afterwards risen. The death rate has fallen with the birth rate, and afterwards risen, showing that the improvements in sanitation have not been the cause of the falling death rate in other countries.

H 28 *Berlin.* The birth rate rose rapidly from 1841 to 1876, and afterwards fell even more rapidly. The death rate, except for epidemics and wars, rose and fell in almost precise correspondence with the birth rate.

H 29-30 *Europe and Western Europe.* These show that the total population of Europe is increasing faster, the more the birth rate falls, while in Western Europe the birth and death rates correspond almost exactly. Calculations made from this show that about 25,000,000 fewer deaths have occurred in Europe since 1876, due to the fall in the birth rate caused by the Knowlton Trial and the Neo-Malthusian movement. It should be noted that in the great majority of cases the decline of the birth rate commenced in 1877, the year of the Knowlton Trial.

[E59]



(SEE SUNDBARG'S APERÇUS STATISTIQUES INT'ONAUX 1905. pp. 76 & 80.)

Figures H 29-30

I [E60]

Exhibits lent by Mr. and Mrs. W. C. D. Whetham.

I 1 1. Pedigree showing the descent of Administrative Ability.

I 2 2. Wollaston Pedigree, showing the descent of Scientific Ability.

I 3 3. Pedigree showing the Mendelian descent of Eye-colour in mankind.

K

The Racial Form of Nose and Its Segregative Inheritance.

By Geo. P. Mudge.

The form of a nose doubtless depends upon many factors. But chief among them we may suppose are the length, breadth, and angle of inclination of the nasal bones; the form, length, breadth, and thickness of the nasal septum, and the degree of development of the turbinal bones. The segregation and persistence in families of a definite type of nose-form is a subject well worth further study. The inheritance of this character from the Mendelian standpoint has not yet been adequately studied. But as with eye-colour, so with nose-form, we desire to know not only how alternative characters are inherited among individuals of the same race, but how they are transmitted among the offspring of mixed races.

ENGLISH V. GIPSY.

K 1 I am able in the photograph exhibited to show what appears to be an undoubted transmission of a very prominent form of nose from a grandmother to a grandson. The grandmother (on the right of the photograph, who is now over 80 years of age) was the wife of a gipsy and she herself

came of gipsy stock. She and her husband eventually settled in a small village in the West of England. They had six children, namely, two sons and four daughters. Of the two sons, one was fair in complexion and had the "wild ways and habits of the gipsy." The other was dark in complexion and married an English countrywoman of the district in which his parents had settled. She was of fair complexion. They are shown, as husband and wife, in the left-hand corner of the central photograph. They have had four children, namely, three girls (shown in the centre of the photograph) and one son (shown standing by the right of his gipsy grandmother in the right corner of the photograph).

The gipsy grandmother has a very prominent type of nose. It is characterised by three chief features: First, the broad base on which the external narial apertures are lodged; second, the [E61] marked convexity of the contour of the bridge; third, the well-defined or sharp angularity of the general form. Her son's nose differs from hers in all three of these points. His wife's nose is of the more rounded type and differs very widely from that of the gipsy grandmother (her mother-in-law). The three girl children of these two parents clearly do not possess a nose like that of their grandmother. The two younger daughters appear to resemble their mother, while the oldest appears to be an intermediate between her mother and father. So far then there is no feature of any special interest.

But it is otherwise when we come to deal with the nose of the son (grandson of the old gipsy woman). For it resembles hers in all three of the marked features which give to her nose its distinctive and prominent form. The convexity of the bridge is, perhaps, not quite so pronounced, but then he is still young, and this is a feature likely to become accentuated with age.

Two features of Mendelian interest are shown in this group of a grandmother, two parents and four grandchildren. First, there is a hereditary transmission of nose type from grandmother to grandson. Second, there is a clean segregation of the nose type manifested by the brother, from the contrasted nose type or types exemplified by his three sisters. In addition, the case is interesting since it manifests segregation of characters in the offspring of parents of different races, *i.e.*, a gipsy and a native of the West of England.

In the absence of precise information concerning the form of nose of the gipsy grandmother's husband, and of their five other children, and of the brothers and sisters of the grandmother, it is difficult to formulate a scheme showing a definite Mendelian inheritance in this case. But the two features alluded to in the preceding paragraph are strongly suggestive of inheritance according to Mendelian principles.

We are indebted to Mrs. Rose Haig Thomas for the general facts of this case and for the photograph of the group.

EUROPEAN V. AMERICAN RED INDIAN.

K 2 A few years ago I had an opportunity of meeting two friends who had spent many years in different parts of Canada and were acquainted with families who were derived from an ancestry partly European and partly North American Indian. I gathered from my friends, in virtue of much kindness and patience upon their part, some valuable facts concerning the nature of various facial features in the offspring of the two mixed races—European and Red Indian. I purpose here to deal with two families and with only one character, *i.e.*, the type of nose. The Red Indian and [E62] European type of nose are easily distinguishable. In the Red Indian the nose is prominent and its frontal profile is formed by two lines which diverge from the bridge towards the base. The latter is, in consequence, very broad. The form of nose is sometimes known as the *busqué* or curved type, since its lateral profile is in outline markedly aquiline. But examination of a series of photographs of Red Indians shows some variation in the lateral profile, since some are decidedly concave. But the broadness at the base is apparently never diminished; it is always marked and unmistakable. The well-pronounced Indian nose can always be easily distinguished from the European nose by persons who have had a long acquaintance with both races. But cases do occur where even an experienced observer would feel some doubt in expressing an opinion as to which type a given nose belonged. Such cases are, however, not common.

K 2a From the pedigrees of families derived from a mixed racial parentage in my possession, I select two for exhibition at this Congress. The first is that known as "Family 5" in my list. In this case a Scotchman (Generation A, S) married a full-blood Indian woman. They had a son and daughter (Generation B, 2 and 3). The half-breed son had the Indian type of nose. The daughter had a small and well-shaped European nose.

The son married a full-blood Indian woman (Generation B, 1) and had four children. Two of these were infants at the time my informant knew them, and though they were described as being generally of the Indian type, they were too young to give any reliable details concerning the form of the nose. The two elder children (Generation C, 1 and 2) were a daughter and a son, and both had the Indian type of nose.

The half-breed daughter (Generation B, 4) married twice. Her first husband was a half-breed Indian (B 3). He was not seen by my informant. They had a son and a daughter (Generation C, 5 and 6). The former was Indian in type of nose as well as in other facial characters. The daughter, though she had very decided Indian cheek bones, had the European type of nose. She is of further interest, inasmuch as while her eye-colour was European the shape of her eyes was characteristically Indian.

The second husband of the half-breed daughter was a Welshman (Generation B, W). By him she had seven children. The last was a baby at the time my informant saw it, and we may leave it out of account. The penultimate child was a son (Generation C, 12), and his nose was sunken, and my informant found it difficult to say whether it was European or Indian in type. I rather suspect from an inspection of some photographs of Indians which I have seen that it resembles a very [E63] concave flattened Indian type. Of the remaining five children, four had an European type and one an Indian type of nose.

Assuming that my informant's observations and memory are accurate—and I feel sure they are quite reliable since he spent many years among the Indians and half-breeds of North America in company with other Europeans, and he is a man of naturally sharp discernment—this family shows clear evidence of the segregation of nose type. It is shown more particularly in the children of the half-breed daughter who married twice, since among her offspring (Generation C, 5-13) both types of nose appeared. The re-appearance of the European nose was manifested, not only when she was mated back to an European in her second marriage, but when she married a half-breed like herself. This latter marriage, however, did not constitute, as we might at first sight regard it, an experimental mating in every way analogous to a Mendelian cross of DR x DR; because although she was a half-breed her nose was not like her brother's of the Indian type, but European.

It thus appears as though the Indian nose was dominant in one case, and the European in the other. Too much stress must not be laid on this point. So many half-breeds are indistinguishable from full-blood Indians, that the possibility is to be borne in mind that this woman's mother, who was married to the Scotchman, was not really a full-blood Indian, and that tradition was in error. I am, however, making further inquiries.

But Mendelian segregation is shown in this pedigree in another way. The granddaughter (Generation C, 6), by the first husband, manifested, as already indicated, an European type of nose and European eye-colour. She also manifested other European characters, with which I do not now purpose dealing. But her cheek bones were decidedly Indian and the shape of her eyes were also Indian. Thus we have the segregation in the same individual of the characters of two distinct races of men. In other words, there has been segregation of racial characters followed by their recombination in a hybrid race. That is a fact of some importance, in what we may designate as anthropological Eugenics, or, if we prefer it, as the Eugenics of Anthropology. For it turns our thoughts to the possibility of calling into being a more perfect type of men by the recombination of the better alternative qualities of two less perfect races.

K 2b The second pedigree exhibited is that of "Family 4" in my list. I am indebted to another informant for the facts of this pedigree, and they relate to another part of North America. In this case a Frenchman (Generation A, F) married a full-blood Indian Princess, namely, a daughter of a [E64] Chief. She had one only daughter (Generation B, 2) whose nose was of the Indian type, but rather flat.

The daughter married an Irishman (Generation B, 1), and they had six children. Of these three had European types of nose and three the Indian type (Generation C, 1-6).

This family shows again an apparently clean segregation of Indian and European types of nose. The two types appear, side by side, in different individuals of the same fraternity.

THE SEGREGATION OF RACIAL EYE-COLOUR.

By Geo. P. Mudge.

It is a matter of importance to know the exact influence which a mixture of races exerts upon the hereditary transmission of characters. For instance, do the alternative characters of two races of men, when they are related by marriage, segregate in inheritance in accordance with Mendelian principles? Is the term "blending or fusion of races misleading, and only accurate when employed in a qualified sense"?

It has been shown by Mr. Hurst's very careful investigations in a Leicestershire village that certain types of human eye-colour, which he designates as "Simplex" and "Duplex," are inherited in complete accord with Mendelian principles of inheritance. The two types not only segregate from each other in the course of transmission, but they do so in practically exact Mendelian proportions. And the "Simplex" type, which is the recessive form of eye-colour, breeds true. It begets nothing but the Simplex eye. These results have been confirmed by Professor and Mrs. Davenport in America. In this and similar cases we are merely dealing with the transmission of alternative characters in individuals of the same race. [D]

[D] Of course, the "English" race is really a community of many commingled races. But from our present standpoint that matters little. It is rather confirmatory of the further facts and conclusions I am about to describe.

But one of the interesting problems of the future is concerned with the transmission of characters when human races of diverse characteristics breed together. We are not concerned to discuss now whether the races of mankind are varieties or species.

K 3

SPANIARD *v.* GIPSY.

The records of travellers provide certain information which helps us to form reliable though limited conclusions as to the results of the interbreeding of different human races. Mrs. Rose Haig Thomas, to whom we are indebted for the exhibit of a photograph, taken during a journey [E65] through Spain a few years ago, of a Spanish gipsy woman with her three children, has made several observations of some interest. She became acquainted with a family in which "the mother was a dark-skinned, black-haired, black-eyed gipsy woman. (See photograph, Exhibit No. K 3.) The husband was a Spaniard with blue eyes. There were three children. Of these, the eldest had flaxen hair and blue eyes. The second was a boy with black eyes, black hair, and an olive skin as dark as the mother's. The third child was too young to justify any conclusion being based on its characteristics. It was only 18 months old; but was flaxen-haired, blue-eyed, and fair skinned." This observation of Mrs. Haig Thomas, in Granada, affords then a clear example of the segregation of blue-eye and flaxen-hair characters among the gametes of the black-eyed, black-haired, and olive-complexioned mother. For, in the light of Mendelian researches, it is obvious she was carrying these characters recessive, and that some of her gametes were pure in respect of them.

ARAB *v.* SPANIARD.

K 4 The second photograph, exhibited by Mrs. Haig Thomas (Exhibit No. K 4), is of three sisters who were also photographed in Granada. The eldest is of the dark, typical "Arab type," so well recognised by Spaniards wherever it is seen in Spain. The second sister is clearly much lighter in hair and fairer in complexion than her sister. The nose, too, is very distinct in both. The baby is fair. It is impossible, of course, to trace the remote ancestry of these sisters, and Mrs. Haig Thomas obtained no information as to their parents, but from what we know of Spanish history the case suggests a possible segregation of Moorish from Gothic features after the intermixture of the two races, by marriage, had occurred. But the question is extremely complex. It is impossible to say to what extent the inhabitants of modern Spain represent in varying degrees a commingled race of Phœnicians and Iberians, of these with Romans and Goths, and of all with Moors, themselves at the time of the conquest of Spain a mixed race. All that can be said with any degree of probability is that these various races have more or less intermingled [E] during the long history of Spain, and that the flaxen hair and blue eyes among its inhabitants are the heritage which the Goths have left them.

[E] I advisedly use the word intermingled and not blended.

EUROPEAN *v.* AMERICAN RED INDIAN.

[E66]

For the facts of the segregation of European and Indian eye-colour, I am indebted to two friends who resided for many years in different parts of Canada, and who do not desire their names published.

K 5 The first case of this kind (Pedigree Chart, No. K 5) of segregation of racial eye-colour is that of the offspring from a marriage between a blue-eyed Scotchman and a black-eyed, full blood American Red Indian woman. [F] They had a son and a daughter, and the eyes of both were Indian brown. This brown differs from that of European eyes, and can usually be distinguished by observers who know the two races well. The half-breed son (No. 2, Generation B) married a full blood Indian woman (No. 1), who also had Indian brown eyes, and by her had four children. Two of them were babies at the time my informant knew them, and we may leave them out of account. The other two, a son and daughter (Nos. 2 and 1, Generation C), had Indian brown eyes. This result is in accord with Mendelian expectations.

[F] This is the same family as Family 5 described in connection with Segregation of Nose Form in exhibit K 2a.

The half-breed Indian daughter (No. 4, Generation B) of the blue-eyed Scotchman and Indian mother married a Welshman (No. 5, B) with hazel eyes. They had seven children. Of these, two—a son and daughter (No. 7 and 11, Generation C)—had blue eyes. The remaining children—with the exception of a baby, whom my informant had seldom seen—had eyes of varying shades of brown. Two (Nos. 9 and 12, C) had European brown, one dark Indian brown, and one Indian brown eyes (Nos. 8 and 10, C).

The re-appearance of blue eyes among two of the Scotchman's grandchildren is a clear example of the Mendelian segregation among the gametes of the half-breed Indian mother of the factors which produce blue eyes. The Welsh father, with the hazel eyes, must, of course, as we deduce from other cases, have carried the blue-eye factors recessive.

The black-eyed full blood Indian grandmother also carried various shades of Indian brown, recessive to the Indian black which she herself manifested, since her daughter and two granddaughters exhibited Indian brown and dark Indian brown coloured eyes. The two European brown-eyed grandsons were probably in eye-colour hybrids between the hazel colour of the Welsh father and the Indian brown of the half-breed Indian mother.

The pedigree is thus, in respect of eye-colour—and of other characters also which are not here [E67] described—clearly Mendelian in its manifestations. It shows that the offspring of two very different types of human races exhibit the same mode of Mendelian inheritance as do the descendants of two contrasted parents of the same race.

K 6 Family 4 (Pedigree Chart, No. K 6) illustrates the same kind of facts and conclusions. In the A

Generation a Frenchman, whose eye-colour was unknown to my informant, married a full blood Indian princess who had Indian brown eyes. There was one daughter only (Generation B) by this marriage, and she had Indian brown eyes. She married an Irishman, who had red hair, grey eyes, and a freckled complexion (Generation B). From this marriage there came six children (Generation C). Two of these had "grey eyes like their father." Three had dark brown eyes of European tint. My informant had some doubt as to the European tint of two of these three (Nos. 3 and 4, C Generation); their eye-colour was very dark brown, and possibly it may have been the Indian tint. The remaining member of this generation had Indian brown eyes of a very dark shade.

It may be desirable to state that Families 4 and 5 come from different parts of Canada.

The chief feature of interest in this family is the segregation of the grey eye-colour of the Irishman among his offspring. It appears in two daughters. From what we know of analogous cases, there is little doubt that the gametes of his half-breed Indian wife carried the blue or grey factors derived from her French father. The appearance of an European brown eye-colour in Generation C, No. 6, suggests that the French grandfather had brown eyes, and that, therefore, this colour has segregated out among the gametes of the half-breed Indian mother.

L **EXHIBITED BY MR. E. NETTLESHIP.**

L 1 Congenital Colour-blindness. Pedigree showing unusual features, viz.: (*a*) females affected; (*b*) twins, of whom one is affected, the other not; (*c*) marriage between two unrelated colour-blind stocks. Except that two females are affected the inheritance, so far as can be traced, has followed the rule for colour-blindness; viz., limitation to males and transmission through unaffected females.

♂ normal male; ♀ normal female. [E68]
♂ colour-blind male; ♀ colour-blind female.
○ batch of whom there are no particulars.
○○ twins. ϕ died in infancy. ob: dead.
× seen and examined.
× × reported normal, but not seen.

L 2 Hereditary night-blindness with myopia (short sight) affecting 21 males and only 1 female in a large pedigree. The night-blindness congenital and stationary. Descent always through mothers themselves unaffected. Mental defects in several of the night-blind stock. Other pedigrees of this male-limited night-blindness are on record.

Key.

♂ and ♀ night-blind male and female. Otherwise the same as for L 1.

L 3 Pedigrees of hereditary congenital Nystagmus (involuntary rhythmical movements of the eyes) showing two different modes of descent.

L 3a In Figure L 3a the nystagmus occurs only in males and descends through unaffected females.

L 3b In Fig. L 3b both males and females are liable to the disease, and either parent may transmit it, although descent is more often through mother than father.

The movements of the eyes are very often accompanied by rhythmical movements of the head in the non-sex-limited type (Fig. L 3b), but head movements very seldom occur in the male-limited type (Fig. L 3a).

In both types many of those affected have also optical defects of the eyes, especially astigmatism. No mental or nerve complications in either kind.

Key.

♂ and ♀ male and female with Nystagmus. Otherwise as for L 1.

L 4 Pedigree of hereditary Cataract. The cataract in this genealogy begins in childhood, and usually progresses so as to require operation by the time its subject is grown up; results of operation usually good and lasting. Most of the affected members still living; of the four dead, [E69] none died before 54, and two of them lived to 78 and 83 respectively. Both sexes affected and either sex may transmit. No other eye disease and no prevalent constitutional diseases or degeneracies in the cataractous stock.

Many similar pedigrees are known.

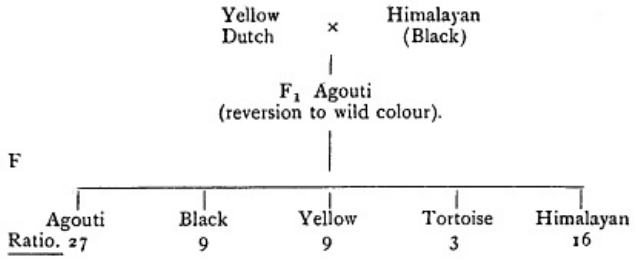
Key.

♂ and ♀ male and female with cataract. Otherwise as for L 1.

M **EXHIBITED BY PROFESSOR R. C. PUNNETT, F.R.S.**

MENDELIAN INHERITANCE IN RABBITS.

M 1.



Factors concerned:—

A. the factor for agouti which turns a black into an agouti, or a tortoise into a yellow.

E. the factor for extension of pigment which when present turns a yellow into an agouti, or a tortoise into a black.

S. the factor for self colour which turns a Himalayan into a self coloured animal.

All the rabbits in this experiment contain the factor for black (B).

M 2. The Himalayan pattern can occur in all four colour classes. Thus the agouti Himalayan has lighter points than the black Himalayan. (cf. 2 specimens shown.)

Experiments to demonstrate that black rabbits may be of different constitution genetically.

Factors concerned in these experiments are:—

A. the agouti factor.

E. the factor for extension of pigment.

D. a factor for density of pigmentation.

All the rabbits are homozygous for the black factor B. [E70]

Homozygous agouti = AA BB EE.

Black rabbits may be either:—

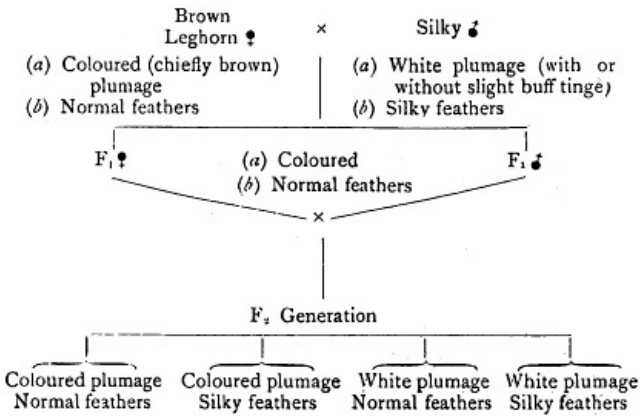
(1) Rabbits of the constitution aa BB EE. These breed true and behave as simple recessive to agouti.

(2) Rabbits of the constitution AA BB EE DD., *i.e.*, agoutis to which a double dose of D has been added are pure blacks in appearance, when only a single dose of D is added the animal shows some agouti markings and is an agouti-black. Such rabbits have always proved to be heterozygous, and when mated together give blacks, agouti-blacks, and agoutis in the ratio 7:6:3.

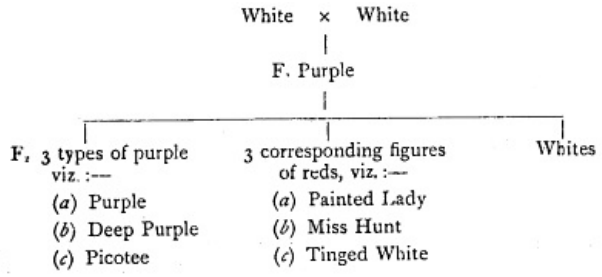
(3) Rabbits of the constitution AA BB Ee Dd. An agouti-black (AA BB EE Dd) becomes a pure black when heterozygous for E. Such blacks when mated with blacks of constitution aa BB EE dd throw some agoutis and also some agouti-blacks.

Further, the experiments have shewn that the factor D is coupled with E in the gametogenesis of rabbits of the constitution AA BB Ee Dd. The gametes produced by such animals are of two kinds only viz—A B E D and A B e d. When mated with a tortoise aa BB ee dd they give blacks and yellows only—and no agoutis. So far as is known, the coupling between E and D is complete. At present this is the only case of coupling between characters yet worked out in a mammal.

M 3 Experiments with Poultry, illustrating the recombination of characters.



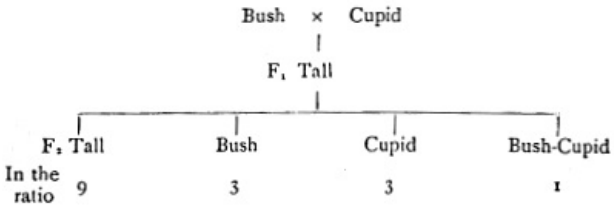
M 4 Experiment with Sweet Peas, illustrating reversion on crossing, followed by the appearance of numerous types in next generation. [E71]



The varied forms in the F_2 generation appear in definite proportions and a certain number of plants of each variety are already "fixed," and have been shewn, by further experiment, to breed true to type.

M 5 Experiment with Sweet Peas, illustrating reversion in structural characters.

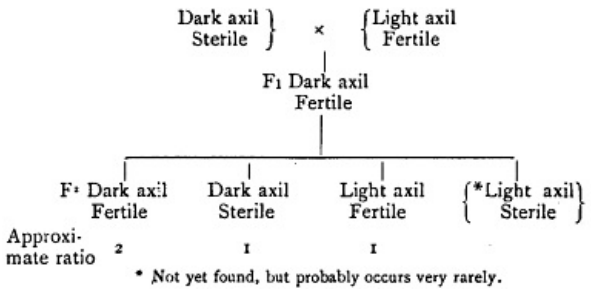
A cross between the ordinary "Cupid" dwarfs and the half-dwarf "Bush" form results in a complete reversion to the normal tall habit such as occurs in the wild sweet pea. A further generation raised from these reversionary talls consists of talls, Bush, Cupids, and a new form, the "Bush-Cupid." These last combine the erect bush-like habit of growth with the dwarfness of the Cupid.



M 6a Example of <u>association of characters in heredity</u>.

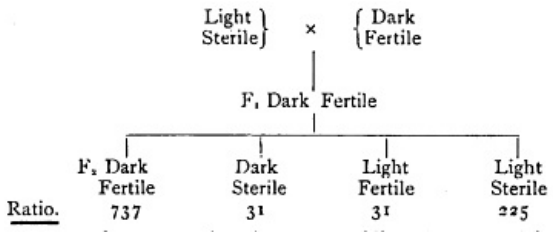
In the sweet pea the dark reddish purple axil is dominant to the light green one. Also the fertile condition of the anthers is dominant to the contabescent sterile condition. In families which involve these characters, the nature of the F_2 generation depends upon the way in which the original cross was made. (A) When each parent has one of the dominant characters.

[E72]



[G] Not yet found, but probably occurs very rarely.

M 6b (B) If, however, both of the dominant characters go in with one parent, and neither with the other parent, they tend to remain associated in F_2; thus:—

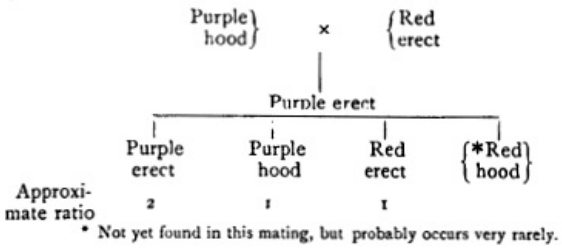


In such a cross the classes resembling the two original parents tend to be produced in excess, while the other two combinations are produced much more rarely. Nevertheless, the ratio of dark to light axil, and of fertile to sterile anthers, is, in each case, a simple 3:1 ratio.

M 7a Example of association of <u>characters in heredity</u>.

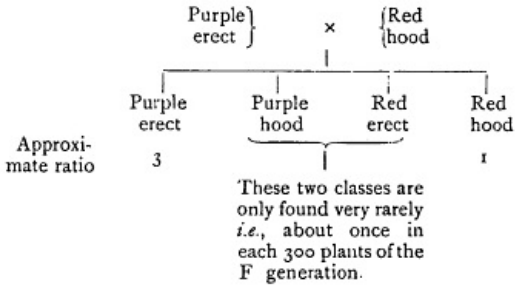
Purple flower colour is dominant to red in the sweet pea, and the old-fashioned erect form of standard with the central notch is dominant to the hooded. In families where these characters are involved, the nature of the F_2 generation depends upon the manner in which the cross was made.

(A) When one dominant character goes in with each parent.



[H] Not yet found in this mating, but probably occurs very rarely.

M 7b (B) When the two dominants enter, from one parent, they tend to remain associated in the F_2 generation. [E73]



N & N 1

Exhibited by the Utah Agricultural College.

Mr. E. G. Titus.

The chart is 147 feet long, 54 inches wide, exclusive of the important data condensed on a separate 8-foot sheet. This is only a preliminary chart, as may be seen from the condensed data attached, which shows that of the 822 persons represented on the chart 539 are of mature age. The unknown persons represent 303, unknown ability; 336, unknown height; 339, unknown weight; 348, unknown health. The family is remarkable for the health of its members, having so far only 97 deaths. The oldest child, Generation II-1, was born in 1827. There are, of course, a large number of persons on the chart who are rather young. Where a person has more than one ability well marked, such as music and literary ability, or music and business ability, or constructive and business ability, the chart shows only one ability. There are several cases where persons have three well marked abilities. In all cases, the following is the rank on the chart:—

Literary ability is always charted. Following this, music and then art, and then constructive. Constructive ability represents those persons who have a decided mathematical and mechanical turn of mind, who are builders, contractors, carpenters of advanced standing, architects and men of these classes. Under "Various" abilities are classified business, agricultural and domestic abilities. These are not marked on the chart.

It will be noticed under "Diseases" that a majority of the persons who have died were infants, and even among infants the deaths are remarkable for their small number considering the conditions under which the people of the third generation of this family had to live. The paternal ancestor, Generation I., came to America in 1842, dying two years later, and his children came to Utah among the early settlers, 1847-52. Many of the third generation were born in this State under conditions that are not by any means comparable to those existing in communities that have been settled for many years. The opportunity to care for children was very limited. [E74] Physicians were not as easily reached, and the methods and appliances of modern times were not at hand. Yet, even under these circumstances, it will be noticed of the 822 persons listed on the chart, that only 68 deaths were those of persons under 25 years.

	GENERATIONS									
	I	IC	II	IIC	III	IIIC	IV	IVC	V	TOTAL
PERSONS CHARTED	1	1	7	18	125	82	384	68	136	822
" OF MATURE AGE	1	1	6	18	118	82	237	68	8	539
ABILITY—LITERARY	1		5	5	30	6	31	2	1	81
MUSICAL			1	1	9	14	27	1	4	57
ARTISTIC			1		4	2	7	1		15
CONSTRUCTIVE	1		2	2	16	3	15	3	2	44
VARIOUS		1	2	3	36	10	9			61
TOTALS	2	1	11	11	95	35	89	7	7	258
NO SPECIAL ABILITY				3	8	1	2			14
ABILITY UNKNOWN				4	26	65	146	61	1	303
HEIGHT 5 FT. OR LESS						1	2			3
5-1 TO 5-2			1	3	2	1	2			9
5-3 TO 5-4		1	2	3	8	10	16			40
5-5 TO 5-6				2	14	9	12	2		39
5-7 TO 5-8			2	2	19	4	14	1		42
5-9 TO 5-10	1		1	1	9	2	10		1	25
5-11 TO 6-0				2	16	3	11	3		35
6-1 TO 6-2					3	1	4	1		9
6-3 TO 6-4					1					1
TOTALS	1	1	6	13	72	31	71	7	1	203
UNKNOWN				5	46	51	166	61	7	336
WEIGHT 100 LBS. OR LESS				2	1	2	2		1	8
101 TO 120				1	10	10	11		1	33
121 TO 150		1	1	6	28	10	27	4	1	78
151 TO 170	1		3	4	23	5	11	6		47
171 TO 200			2	4	7	3	5	6		27
201 TO 220					3	1				4
221 TO 250					1		2			3
TOTALS	1	1	6	17	73	31	58	10	3	200
UNKNOWN				1	45	51	179	58	5	339

	GENERATIONS									
	I	IC	II	IIC	III	IIIC	IV	IVC	V	TOTALS
HEALTH—EXCELLENT	1	1	6	3	34	15	131	6	44	241
GOOD				7	42	16	54	4	18	141
FAIR				3	3	4	8			18
DELICATE				1	2		4			7
POOR				1	7	2	11			21
TOTALS	1	1	6	15	88	37	208	10	62	428
UNKNOWN				3	24	45	147	58	71	348
DIED UNDER ONE YEAR					8		16		2	26
1 TO 5 YEARS			1		5		13		1	20
6 TO 25 YEARS					11		11			22
26 TO 40 YEARS					3					3
41 TO 70 YEARS	1			2	5	2				10
PAST 70 YEARS			1	3						4
AGE UNKNOWN		1		2	5	2	1	1		12
TOTALS	1	1	2	7	37	4	41	1	3	97
CAUSE OF DEATH										
PREMATURE BIRTH					1		5			6
INFANTILE COMPLAINTS			1		11		13		3	28
DIPHTHERIA					3		5			8
SCARLET FEVER							2			2
MEASLES					1					1
TYPHOID FEVER					2		2			4
PNEUMONIA				1	6	1	1			9
CONSUMPTION					2					2
OPERATIONS					1					1
CHILD BIRTH					1		1			2
VARIOUS		1	1	6	6		9			23
UNKNOWN	1				3	3	3	1		11
TOTALS	1	1	2	7	37	4	41	1	3	97

Transcription provided below.

O [E75]

Exhibited by the Eugenics Education Society.

O 1 Mendelism.

O 1a Theoretical Example of Mendelian Inheritance in Peas. (After *Thomson*.)

O 1b Theoretical Example of Mendelian Inheritance in Peas. (After *Laurie*.)

O 1c Theoretical Example of Mendelian Inheritance, with Dominance, in Mice. (After *Laurie*.)

O 1d Illustration of the Theory of Gametic Purity in Mendelian Heredity in Mice. (After *Laurie*.)

O 1e Example of Mendelian Inheritance, without Dominance, in Blue Andalusian Fowls. (After *Laurie*.)

O 1f Illustration of the Theory of Gametic Purity in Mendelian Heredity, in Blue Andalusian Fowls. (After *Laurie*.)

O 2 Standard Scheme of Descent. (After *Galton*.)

O 3 Comparison of Mr. Booth's Classification of All London with the Normal Classes. (After *Galton*.)

O 4 Descent of Qualities in a Population. (After *Galton*.)

O 5 Inheritance of Ability, as exemplified in the Darwin, Galton, and Wedgwood Families. (After *Whetham* and *Marshall*.)

P

Exhibited by the American Breeders' Association—Eugenics Section.

C. B. Davenport, Esq.

P 1-16

Charts of Statistics of Defectives.
Charts of Classification of Defectives.
Charts of Principles of Heredity.
Pedigrees collected by field-workers in America.

Q

Exhibited by Cyril Burt, Esq.

Description of Diagrams illustrating the use of experimental Tests of Mental Capacities.

1. "Experimental Tests of General Intelligence."

Q 1 A List of twelve tests applied to two schools at Oxford. The first two columns of figures indicate the "reliability" or self-consistency of the tests as compared with that of examinations and master's general impression. The second two columns give the correlations of the results of the tests with the children's "general intelligence." It will be seen that several of the tests of [E76] higher mental processes are as reliable as the scholastic tests at present in vogue, and that they correlate quite as highly with intelligence. Further experiments show that while examinations and master's estimates measure knowledge and skill acquired by memory and training, the tests seems to provide measurements rather of innate capacities; and that children of superior parentage (*e.g.* the preparatory school boys) are themselves superior at tests, which show an appreciable positive correlation with intelligence (*i.e.* all except tests of touch and weight). The tests thus provide an experimental demonstration of the inheritance of mental ability and a means of measuring the same. (References:—Burt, Experimental Tests of General Intelligence, British Journal of Psychology, Vol. III., Pts. 1 and 2.) Burt, Inheritance of Mental Characteristics, Eugenics Review, 1912, July.

Q 2 2. Sex-differences in mental tests.

A list of experimental tests applied to children of both sexes with a view to measuring their innate capacities for performing mental processes of different levels of complexity. The amount of divergence between the sexes, is indicated by the column in red. It will be seen that the sex-differences become smaller, the higher the level tested. There is some evidence to show that these differences are the result of inheritance and are not the result of difference of tradition or environment. (References: Burt and Moore, the Mental Differences between the sexes. Journal of Experimental Pedagogy, 1912, June. Burt, Inheritance of Mental Characteristics, Eugenics Review, 1912, July.)

R

Exhibit by Dr. George Papillault.

Four sets of questions drawn up by Dr. George Papillault, Professor of Sociology in the Paris School of Anthropology, with a view to noting and comparing the bio-social characteristics of individuals belonging to different groups of population.

R 1 Set of questions adopted by the Commission of Criminology instituted and presided over by Mr. —— Keeper of the Seals; Vice-presidents, Messrs. Léon Bourgeois, senator, and Dr. Dron, Vice-president of the Chamber of Deputies and Reporter to the Commission; Scientific Secretary, Dr. G. Papillault.

This set of questions comprises:

1st. An individual criminological chart for the purpose of showing 271 biological and social characteristics of the prisoners.

2nd. Family Charts for each of the ancestors, descendants or collateral relatives of the prisoner and more particularly intended to note hereditary characteristics.

These Charts have been issued with a view to a methodical enquiry on the criminal, under the [E77] direction of the Scientific and Criminological Department.

R 2 Set of questions of the French Lay Mission, designed to note the characteristics of the young natives and of their relatives in the French Colonies. The teachers will have to return them filled up with the greatest care to the Lay Mission, where Dr. Papillault, before their departure, delivered a series of lectures to teach them how to proceed.

R 3 Questions on the half-breeds, adopted by the Paris Society of Anthropology, and designed to show the bio-social characteristics of the half-breeds proceeding from cross-breeding between different races.

R 4 Questions asked by the General Psychological Institute for the purpose of undertaking a vast enquiry on the value taxonomic, organic, bio-social, and selective of the different human races which actually exist in the French Colonies, and particularly in North Africa.

A like spirit and method governs these four sets of questions; to discard the verbalism which obstructs and imperils Sociology; to study characteristics precise, objective, easily controllable and comparable, and likely consequently to form statistics, which alone, are capable of revealing characteristics of groups; to establish the correlations which these characteristics may present

among themselves, and to arrive at last at the discovery of positive sociological laws.

S

Exhibited by Frederick Adams Woods, M.D.

Thirteen photographic copies of authentic portraits of distinguished historical personages of the sixteenth century, showing that the bony framework of the face, especially about the nose and eyes, was not commonly the same as it is to-day.

These are samples of a much larger collection.

S 1 Charles VII., XV Century, eye-brows very high above the eyes.

S 2 Mary of Lorraine, Queen of James of Scotland (National Portrait Gallery). Eyes far apart, and eye-brows high.

S 3 Francis I. of France, French School, XVI. Century. (Louvre.) Eyes small, upper eye-lids peculiar, and typical of the period.

S 4 Louse de Rieux; Marquise d'Elboef, XVI. Century. (Louvre.) Naso-orbital region typical, eyes small far apart, upper part of the nose broad and flat, upper eye-lids long (vertical distance between eye and eye brow considerable.)

S 5 Dr. Stokesley, Bishop of London (Holbein.) Eyes far apart upper part of nose broad. [E78]

S 6 Jane Seymour (Holbein). Eyes far apart, upper eye lids characteristic.

S 7 Jean de Bourbon, Comte d'Enghien. XVI Century. Eyes far apart, upper eye-lids vertically prominent.

S 8 Portrait of a young German gentleman.

The eye-lids are modern, that is the eyes are set in deeply under the arch, but the eyes themselves are far apart, and the upper part of the nose is broad.

S 9 Mary Queen of England. (National Portrait Gallery).

It would seem that allowance might be made for the crudity of the portrait, but the naso-orbital region is typical of the northern races during the XVI century.

S 10 Holbein's Duke of Norfolk. In the Royal Gallery at Windsor Castle.

Eyes are more deep-set under the superorbital arch than is usual in portraits of the period, but the upper part of the nose is broad, and eyes are far apart.

S 11 Henry VIII., attributed to Holbein but on doubtful authority.

Broad flat nose, small eyes set far apart, eye-brows arching upward and outward. Observe the upper eye-lids in contrast to the Italian by Lorenzo Lotto, which shows the usual modern type of eye-lid.

S 12 Portrait of the Prothonotary Apostolic Juliano. (Lorenzo Lotto.)

Modern type of face. Eyes deep set in under the superorbital arch and eye-brow. Upper part of the nose delicate and projecting. This type of face is occasionally, but only rarely met with north of the Alps during the early period. It is common enough in portraits of Italians.

S 13 Portrait of a German scholar, by Holbein. Modern type, very rarely found.

[P1]

First

International Eugenics Congress,

LONDON, 1912.

PROGRAMME.

Contents.

All Communications should be addressed to the Secretaries.

Offices of the Congress: "The Eugenics Education Society,"
6, York Buildings, Adelphi, London.

(**Office Hours, 10-30 a.m. to 5 p.m.**)

[P2]

PRESIDENT *MAJOR LEONARD DARWIN, D.Sc.

Vice-Presidents.

Sir Clifford Allbutt, K.C.B., F.R.S., M.D., Regius Professor of Physic, Cambridge.

The Right Hon. Lord Alverstone, G.C.M.G., LL.D., Lord Chief Justice.

The Right Hon. Lord Avebury, F.R.S.

Sir Thomas Barlow, Bart., K.C.V.O., F.R.S., President of the Royal College of Physicians.

Dr. Alexander Graham Bell, Founder of the Volta Bureau, Washington.

Sir William Church, K.C.B., D.Sc., lately President of the Royal College of Physicians.

The Right Hon. Winston Churchill, M.P., First Lord of the Admiralty.

Sir William Collins, F.R.C.S., Vice-Chancellor of the University of London.

Dr. C. B. Davenport, Secretary of the American Breeders' Association.

Dr. J. Déjérine, Clinical Professor of Nervous Diseases, Salpêtrière.

Dr. Charles W. Eliot, President Emeritus of Harvard University.

Dr. Auguste Forel, Lately Professor of Psychiatry, University of Zurich.

Sir Archibald Geikie, President of the Royal Society.

Sir Rickman J. Godlee, F.R.C.S., President of the Royal College of Surgeons.

Professor M. von Gruber, Professor of Hygiene, Munich, President of the German Society for Race Hygiene.

Dr. David Starr Jordan, Principal, Leland Stanford University. President of the Eugenic Section, American Breeders' Association.

Monsieur L. March, Director, Statistique Générale de la France.

The Right Hon. Reginald McKenna, M.P., Secretary of State for Home Affairs.

The Right Hon. The Lord Mayor of London.

Dr. Magnan, l'Asile Sainte-Anne, Paris.

Dr. L. Manouvrier, Professor of Anthropology, Paris.

Dr. A. Marie, Asiles de la Seine.

Sir Henry Alexander Miers, D.Sc., F.R.S., Principal of the University of London.

Professor Alfredo Niceforo, Professor of Statistics, Naples.

Sir William Osler, M.D., F.R.S., Regius Professor of Medicine, Oxford.

The Right Rev. The Lord Bishop of Oxford, D.D.

Dr. E. Perrier, Director, Natural History Museum, Paris.

Gifford Pinchot, Washington.

Dr. Alfred Ploëtz, President of the International Society for Race Hygiene, Germany.

Sir William Ramsay, F.R.S., Professor of Chemistry, University of London.

The Right Rev. The Lord Bishop of Ripon, D.D.

Professor G. J. Sergi, Professor of Anthropology, Rome.

Dr. E. E. Southard, Neuro-Pathologist, Harvard University, and Director of the State Psychopathological Hospital.

The Right Hon. Sir T. Vezey Strong, K.C.V.O.

Bleecker van Wagenen, of the Board of Trustees, Vineland Training School, New Jersey, U.S.A.

Professor August Weismann, Professor of Zoology, Freiburg.

Honorary Members.

Monsieur Henri Jaspar, Avocat à la Cour D'Appel, Président de la Société Protectrice de l'Enfance Anormale; Secrétaire de la Commission Royale des Patronages, Brussels.
Monsieur Adolph Prins, Inspecteur Générale des Prisons, Brussels.
Professor Ludwig Schemann, President of the Gobineau-Vereinigung, Germany.
His Excellency the General von Bardeleben, President of the *Verein Herold*, Berlin.

[P3]

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Committee.

The Committee of the International Society for Race Hygiene.

ITALIAN CONSULTATIVE COMMITTEE.

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Committee.

Professors Corrado Gini, Achille Loria, Roberto Michels, Enrico Morselli, Sante de Sanctis, Giuseppe Sergi, V. Ginffrida-Ruggeri.

[P4]

First International Eugenics Congress

LONDON.

Wednesday, July 24th, to Tuesday, July 30th, 1912.

General Arrangements for the Meeting.

An invitation circular has been widely circulated to all members of Eugenic and Heredity Societies in Europe and America, and to many other persons likely to be interested in the approaching Congress. Through that circular the objects and general plan of the Congress have been made widely known. Copies may still be had on application to the Secretary.

The following arrangements have now been definitely made.

Place of Meeting. The Meetings of the Congress will be held in the Great Hall of the University of London, Imperial Institute Road, South Kensington, London, S.W., which is easily reached from South Kensington Station on the Underground Railway, and by omnibus from all parts of London. (In wet weather those travelling by rail can avail themselves of the subway).

Headquarters of the Congress. Until Tuesday, July 23rd, the headquarters and offices of the Congress will remain at 6, York Buildings, Adelphi, W.C. (close to Charing Cross Station), where all information will be supplied and tickets issued. Office hours 10-30 a.m. to 5 p.m. On and after Wednesday, July 24th, the headquarters will be transferred to the University of London, South Kensington. If arrangements for hotels or for lodgings have not been made previously, members arriving on and after July 24th are recommended to leave their luggage in the "Cloak Room" at the railway station and come to the office of the Congress, at London University, South Kensington, for information.

Correspondence. From July 24th to 30th, Members and Associates of the Congress may have their letters addressed to them at the First International Eugenics Congress, c/o The University of London, South Kensington, S.W., where special postal facilities will be provided. All invitations to Receptions, etc., will be distributed in this way.

Languages. It has been decided that in the Meetings and Discussions the English, French, German, and Italian languages shall be on an equal footing. At the same time it is right to point out that in all Congresses the number of Members speaking and understanding only the language of the country in which they are held has been far in excess of those conversant with several languages; therefore those who speak in English on the present occasion will be most widely

understood. The abstract of every paper which is received in time by the Secretary will be translated into English, French, and German. Pamphlets containing the abstracts in these languages will be available on July 24th at the University Buildings. Members wishing for advance copies should notify the fact to the Secretaries, and state clearly in what language they are required, and to what address they should be sent.

Stewards. A number of Stewards acting as interpreters will be in attendance; the languages [P5] spoken being indicated by rosettes of the following colours:—Red, French; Blue, German; Green, Italian.

Hotels, etc. The Organising Committee is prepared to book rooms in advance for intending Members. Lists of hotels and the accommodation vouchers have been sent out to all Members with their membership cards. Any Member wishing to pay his membership fee on arrival can on application obtain an accommodation voucher in advance.

To make certain of securing the accommodation desired, it is essential that accommodation vouchers duly filled in should reach the office not later than July 10th.

Tickets of Membership. In order to take advantage of the reduced fares offered by the railway companies (see below), the official Congress ticket must be produced when paying the fare. The subscription entitling to membership of the Congress is £1 sterling; for an Associate it is 10/-. Members may obtain additional tickets for ladies at the cost of 10/- each. These additional ladies' tickets are transferable to ladies. Associates are entitled to all the privileges of Members, except that they have no vote in the meetings and will not receive a copy of the Report when published. The tickets of all Members and Associates who pay in advance will be forwarded to their addresses before the commencement of the Congress. A limited number of Day Membership Cards at 5/- each will be obtainable from the Secretary's Office in the Marble Hall during the Congress. These cards admit to both the morning and afternoon sessions, but do not carry the privileges of voting and hospitality.

Inaugural Banquet. An Inaugural Banquet will be held at the Hotel Cecil on Wednesday, July 24th, at 7 p.m., at which all the officials of the Congress and readers of papers will be the guests of the Entertainments Committee. Members of the Congress can obtain tickets at ⅞ each, from the Hon. Secretary, Entertainments Committee, 30, York Terrace, Harley Street, London, W. Speeches of welcome will be made by the President, the Lord Mayor of London, the Rt. Hon. A. J. Balfour, and others. The Banquet will be followed by a Reception to which all Members and Associates of the Congress will be invited.

Railway Arrangements. Important concessions have been made by a number of Railway Companies to Members and Associates of the Congress. On the railways of Russia, Austria-Hungary, Germany, Switzerland and Holland, no reductions will be allowed; but by taking tickets to a station in Belgium or France, near the frontier, reductions may be secured by groups of not less than 20 visitors travelling together from those countries for the rest of their journey. [P6] **In all cases it is necessary to produce the Congress Membership Ticket before receiving railway tickets at reduced rates; and arrangements MUST be made in advance, 14 days' notice being required. Persons desiring to take advantage of these concessions must therefore forward their subscriptions at once; and immediately on receipt of their membership ticket should communicate with the Secretary of their country** (see page 3). In the following list the countries most distant from London are mentioned first:—

Italy. The P.L.M. Company will grant a reduction of 50% to Members coming from Italy via Modane.

At the time of issuing this notice definite information regarding reduced rates on the Italian State Railways is not to hand.

Germany. Members from Germany desiring to obtain reduced rates are requested to communicate, through their Secretary, with the General Agent of the South Eastern and Chatham Railway Office in Cologne (6 Domhof). Provided at least 20 Members travel together on the journey to London, arrangements can be made for reduced fares at 50% reduction from the Belgian or from the Dutch Frontier to London and back. At least 14 days' notice must be given to secure these facilities.

Belgium. If at least 20 members travel together, a reduction of about 50% is granted. Members are requested to communicate, through the Secretary of their country, with the General Agent of the South Eastern and Chatham Railway in Brussels (19, rue de la Regence).

France. On presentation of their Congress Cards, members attending the Congress will be able to obtain at Paris (Gare du Nord) special 15 day return tickets to London via Calais-Dover or Boulogne-Folkestone at the following fares:—

1st Class.—72f. 85c. 2nd Class.—46f. 85c. 3rd Class.—37f. 50c.
available from July 22nd.

These tickets are available by the following trains:—

Paris (Nord)	dep.	8-25 a.m.	3-05 p.m.	9-20 p.m.
London (Charing Cross)	arr.	3-25 p.m.	10-45 p.m.	5-43 a.m.

(B) (B) (C)
(B) via Boulogne-Folkestone.
(C) via Calais-Dover.

Special arrangements can be made for reserved accommodation to be provided for groups. The above-mentioned tickets can also be obtained at the Paris Office of the South Eastern and Chatham Railway (14 Rue du 4 Septembre), but the Congress vouchers must be presented at the time in either case.

Another Route—From Paris (St. Lazare) special 15 day return tickets to London via Dieppe-Newhaven at the following fares:—

1st Class.—47f. 20c. 2nd Class.—36f. 40c.

These tickets are available for the following trains:—

Paris (St. Lazare)	dep.	10-20 a.m.	9-00 p.m.
London (Victoria)	arr.	7-40 p.m.	7-50 a.m.

Great Britain. All the British Railways have very kindly granted exceptional facilities to members of the Congress. Return tickets for the price of a single fare and a third, lasting from July 23rd to 30th, will be issued from all stations in the United Kingdom on presentation of the Congress voucher at the Booking Office. [P7]

Members wishing to return to their homes outside London daily, must apply for separate vouchers for each day if the distance is more than 50 miles. If however the member resides within that distance, the usual sleeping-out arrangements will apply, *i.e.*, that tickets at a single fare and a third for the double journey may be issued (upon production of cards of membership or letters of invitation), FROM the town where the Conference is being held to places where the delegates reside. The minimum fare will be 1/-.

Stations Of Arrival. Passengers travelling from the Continent by the South Eastern and Chatham Railway, arrive at Victoria or Charing Cross Stations according to the train service selected. Passengers by the Great Eastern Railway arrive at Liverpool Street Station; and those by the London, Brighton, and South Coast Railway arrive at Victoria Station.

Hospitality Bureau. During the meeting of the Congress there will be many entertainments in the form of receptions, dinners, afternoon and evening parties, for which there will be invitations to Members and Associates of the Congress. In most cases the number to be entertained is limited, and it is desirable that the Secretaries should have as complete a list of members as possible to submit to the hosts.

All **Officials of the Congress**, and **Readers of Papers**, and **Delegates**, will shortly receive invitations to the various entertainments mentioned in the programme.

Members should apply at the Hospitality Bureau in the Marble Hall on arrival, as the number that can attend each function is limited, and cards will be issued to members in order of application.

A limited number of Tickets for the Zoological Gardens, tickets to hear debates in the House of Commons, and invitations to tea on the Terrace of the House of Commons, etc., will also be available.

The German Athenæum Club has very kindly signified its willingness to accord the privilege of Hon. Membership of the Club to German Readers of Papers and Members of the German Consultative Committee, and to a limited number of German Members of the Congress.

[P8]

RULES OF PROCEDURE.

The Organising Committee feel that the interest and usefulness of the Congress will be greatly increased by the usual sectional plan being departed from, so that all papers can be discussed in general sittings. This plan will necessarily limit the time available for papers, but, on the other hand, it will allow the interest of all members to be focused on each question to be considered. To enable the maximum amount of work to be done in the time available, the following arrangements have been made:—

Papers. The reader of each paper will be allowed 25 minutes in which to give a summary of his paper and to reply to criticisms. A certain time, limited at the discretion of the Chairman, will then be allowed for discussion (maximum time—20 minutes).

Should the reader of a paper not desire to exercise his right of reply he may devote the whole 25 minutes to his opening summary.

If, on the other hand, he prefers to reserve a longer time for reply he must reduce the length of his opening remarks, bearing in mind that the whole time at his disposal for the two speeches will be 25 minutes.

Discussions. All discussions are under the absolute control of the Chairman, who will regulate the length of time allotted to each discussion, and to each speaker in that discussion. The Chairman will ring a bell one minute before each speech must end. After the bell is rung a second time the next speaker will be called. The maximum time allotted to the discussion on each single paper is twenty minutes,—to each single speaker, seven minutes.

The names of persons wishing to speak must be handed up to the Chairman before the conclusion of the speech opening the Discussion.

Badges. A button badge, consisting of a reproduction of the head of Sir Francis Galton, will be presented to every Member and Associate.

A silvered medal with ribbon and clasp will be presented to members of the Consultative Committees, Readers of Papers and Government Delegates. Distinctive colours will be as follows: —

Organizing and Consultative Committees	Medal	and	Red Ribbon.
Readers of Papers	"	"	White "
Stewards	"	"	Yellow "
Executive Committee	"	"	Blue "

The medals with green ribbons will be on sale, price 1/- each, to all Members and Associates.

[P9]

DAILY PROGRAMME.

This programme will be adhered to as closely as possible, but the Executive Committee reserve the power to make any alterations which circumstances may render necessary.

WEDNESDAY, JULY 24th.

10 a.m.

The Offices of the Congress will be opened at the University of London, South Kensington.

Members and Delegates are requested to call during the day, to sign the register and enter their address, and to obtain invitations to the Receptions, Dinners, etc.

3 p.m.

A Meeting of the Congress Executive Committee will be held in the Senate Room. The Congress Executive consists of the President, Secretary, and two members of each of the Consultative Committees, and the President, Secretary and two members of the British Executive Committee.

Business :—

The arrangement of the agenda for the Business Meeting on the 27th.

7 p.m.

Reception bu the President of the guests to the **Inaugural Banquet** at the Hotel Cecil, Strand. The Banquet commences at 7-30 p.m. punctually. Speeches will be made by the President, The Lord Mayor of London, Mr. A. J. Balfour and others.

All Officers of the Congress, Readers of Papers, Presidents and Secretaries of Branches of the Eugenics Education Society, are the *guests of the Hospitality Committee*. Ordinary Members of the Congress may attend (tickets, 7s. 6d. each, exclusive of wine) and may take one friend on the same terms. The maximum seating capacity of the hall is 400 and only a limited number of seats are available. **To prevent disappointment early application for tickets should be made on the form on page 25, to the Hon. Secretary, Mrs. Alec Tweedie, Entertainments Committee, 30, York Terrace, Harley Street, W.**

9-45 p.m.

Reception of welcome to all Members and Associates of the Congress at the Hotel Cecil to meet the delegates and others who have attended the Inaugural Banquet.

[P10]

SECTION I.

Biology and Eugenics.

THURSDAY. JULY 25th.
MORNING SESSION.

10 a.m. Opening of the Congress.

Presidential Address.

10-30 a.m. "Le Cosidette Leggi Dell 'Ereditarieta Nell' Uomo." (The So-called Laws of Heredity in Man.)

V. Guiffrida-Ruggeri, Professor of Anthropology, Naples. Speakers in discussion Professor J. A. Thomson, Dr. Apert.

11-15 a.m. "The Inheritance of Fecundity."

Raymond Pearl, Ph. D.
Biologist of the Maine Experiment Station, Orono, U.S.A.

Discussion.

12 noon. "Variation and Heredity in Man."

L. Sergi, Professor of Anthropology, Rome. Discussion opened by Dr. Seligmann.

12-45 p.m. "On the Increase of Stature in certain European Populations."

Soren Hansen, M.D., Director of the Danish Anthropological Committee, Copenhagen.

Luncheon Interval.

1-15 p.m. Cold Lunch will be provided at the University for all Readers of Papers and Members of the Congress Executive Committee who give in their names at the Secretary's table before 11-30 a.m. A few places will be available (Lunch, 2/-) for ordinary members of the Congress. Application for seats should be made at the Secretary's table before noon. (A list of neighbouring restaurants will be found on page 27).

[P11]

SECTION I.

AFTERNOON SESSION.

2·30 p.m. "Eugenics and Genetics."

R. C. Punnett, F.R.S., Professor of Biology, Cambridge University.

Discussion opened by Professor W. Bateson.

3·15 p.m. "The Inheritance of Epilepsy."

David F. Weeks, M.D.,

Medical Superintendent and Executive Officer of the New Jersey State Village for Epileptics, U.S.A.

(*These papers will be illustrated by Lantern Slides*).

4 p.m.

"La Psicologia Etrica e la Scienca Eugenistica."

(Ethnic Psychology and the Science of Eugenics).

Professor Enrico Morselli, Director of the Clinic for Mental and Nervous Diseases, Royal University, Genoa.

Discussion.

4·45 p.m.

"Influence de l'age des Parents sur les Caractères Psycho-Physique des Enfants."

(The Influence of Parental Age on the Psycho-Physiological Characters of Children).

Professor Antonio Marro,

Director of the Lunatic Asylum, Turin.

Discussion opened by Dr. Ewart.

ENTERTAINMENTS.

9·30 p.m.

Her Grace the Duchess of Marlborough will hold a Reception at Sunderland House, Curzon Street. (The card of invitation should be given up at the door).

Officials and **Delegates**, *who receive their cards in advance*, are requested to return them at once to the Hon. Secretary, Entertainments Committee, 30, York Terrace, Harley Street, W., *if they do not intend to be present*.

Ordinary Members of the Congress are requested on their arrival in London to *apply at the Hospitality Bureau*, at the University for the invitation card.

[P12]

SECTION II.
Practical Eugenics.

FRIDAY, JULY 26th.

MORNING SESSION.

10 a.m.

Considérations Générales sur "La Puériculture avant la Procreation."

(General Considerations on "Education before Procreation.")

Professor Adolphe Pinard, Member of the Paris Medical Academy.

Discussion.

10·45 a.m.

"The Bearing of Neo-Malthusianism upon Race Hygiene."

Dr. Alfred Ploëtz, President, International Society for Race Hygiene.

Discussion opened by Dr. Drysdale.

11·30 a.m.

"Rapport sur l'organisation Pratique de l'Action Eugénique."

(Report on the Practical Organisation of Eugenic Action).

Dr. Louis Querton, Professor of the "Université Libre," Brussels.

11·50 a.m.

Discussion opened by Dr. C. W. Saleeby.

12·35 p.m. "Marriage and Eugenics."

Dr. C. B. Davenport, Director Eugenics Record Office, U.S.A.

1·15 p.m.

LUNCHEON INTERVAL. [G]

[G] For arrangements see pages 10 and 27.

[P13]

SECTION II.

AFTERNOON SESSION.

2·30 p.m. "Preliminary Report to the First International Eugenics Congress of the Committee of the Eugenics Section American Breeders' Association to Study and Report as to the Best Practical Means for cutting off the Defective Germ Plasm in the Human Population."

Mr. Bleecker van Wagenen, Chairman of Committee.

(*This paper will be illustrated by Lantern Slides*).

Discussion to be opened by Sir John Macdonnell.

3·45 p.m. "Eugénique Sélection et Déterminisme des Tarés."

(Eugenic Selection and Elimination of Defectives).

Frederic Houssay, Professor of Science, University, Paris.

Discussion.

4·30 p.m.

CLOSE OF MEETING.

ENTERTAINMENTS.

5 p.m. The Lord Mayor of London will receive the Members of the Congress at the Mansion House, between the hours of 5 and 7 p.m., when the suites of rooms will be on view.

10 p.m. The American Ambassador and Mrs. Whitelaw Reid are giving a Reception to the Members of the Congress at Dorchester House, Park Lane, at 10 p.m.

(*For directions as to invitation cards see page 11, at foot*).

[P14]

SECTION IIa.
Education and Eugenics.

SATURDAY, JULY 27TH.

MORNING SESSION.

10 a.m. "Eugenics and the New Social Consciousness."

G. Smith, Professor of Sociology, Minnesota University, U.S.A.

Discussion to be opened by Mrs. MacCoy Irwin.

10·45 a.m. "Practicable Eugenics in Education."

DR. F. C. S. SCHILLER, Oxford University.

A Discussion will be arranged in which it is hoped several well-known Educationalists, including PROFESSOR SADLER and DR. GEORGES SCHREIBER will participate.

1 p.m.

LUNCHEON INTERVAL. [H]

[H] For arrangements see pages 10 and 27.

3 p.m.

GENERAL MEETING OF CONGRESS.

Business Agenda.

To be issued after the Meeting of the Congress Executive Committee on July 24th, and circulated to all members on the 26th.

4 p.m.

CLOSE OF MEETING.

ENTERTAINMENTS.

The Co-Partnership Tenants have invited Members to visit the **Hampstead Garden Suburb**, where they will be entertained to tea. The party leaves South Kensington Station at 2-30 p.m.

Several Luncheon and Tea Parties are also being arranged for this day. Will any Members wishing to enjoy this hospitality give in their names not later than the afternoon of Thursday, July 25th, at the Hospitality Bureau in the Hall of the University?

SUNDAY, JULY 28th.

A Lunch and Garden Party will be given by Mr. Robert Mond to the Members of the Congress in the Grounds of Combe Park, Sevenoaks (near London). Guests will be conveyed there and back by special train. Invitations and all particulars will be issued in the same way as for the Duchess of Marlborough's reception. (See page 11, at foot).

The Proprietors of the **London Aerodrome** have kindly issued a limited number of invitations to witness exhibition flights during the afternoon (weather permitting).

[P15]

SECTION III.

Sociology and Eugenics.

MONDAY, JULY 29th.

MORNING SESSION

10 a.m. "Elite Fisio—Psichica ed Elite Economica."

("The Psycho Physical Elite, and the Economic Elite.")

ACHILLE LORIA, Professor of Political Economy, University of Turin.

10·25 a.m. "The Cause of the Inferiority of Physical and Mental Characters in the Lower Social Classes."

Alfredo Niceforo, Professor of Statistics at the University of Naples.

(*As these two papers treat of similar subjects, they will be grouped for discussion.*)

11 a.m. "La Fertilité des Marriages suivant la Profession et la Situation Sociale."

(The Fertility of Marriages according to Profession and Social Position).

Monsieur Lucien March,

Directeur de la Statistique Générale de la France.

Discussion opened by Mr. Bernard Mallett.

11·45 a.m. "Eugenics and Militarism."

Vernon L. Kellogg, Professor of Entomology, Stanford University.

12·30 p.m. "Eugenics in Party Organisation."

Roberto Michels, Professor of Political Economy, University of Turin.

1 p.m.

LUNCHEON INTERVAL. [I]

[I] For Arrangements see pages 10 and 27.

[P16]

SECTION IIIa. (Continued).

Sociology and Eugenics.

MONDAY, JULY 29th.

AFTERNOON SESSION.

2·30 p.m. "The Influence of Race on History."

W. C. D. and Mrs. W. C. D. Whetham, Cambridge.

2·55 p.m. "Some Interrelations between Eugenics and Historical Research."

Dr. Adams Woods, Harvard Medical School.

(*As these two papers are on similar subjects they will be grouped and discussed together*).

4 p.m. "Contributi Demografici ai Problemi dell' Eugenica."

(The Contributions of Demography to Eugenics).

Corrado Gini,

Professor of Statistics, University of Cagliari, Italy.

4·45 p.m.

CLOSE OF SESSION.

ENTERTAINMENTS.

9·30 p.m. A Reception will be given at the University of London by the President and Mrs. Leonard Darwin. (Invitations to this reception will be forwarded to all Members and Associates on their joining the Congress. Those Members who join on or after Wednesday, 24th, should apply for their cards at the Hospitality Bureau at the Congress.)

[P17]

SECTION IV.

Medicine and Eugenics.

TUESDAY, JULY 30th.

MORNING SESSION.

10 a.m. "Sur la prophylaxie de la Syphilis Héréditaire et son action Eugénique."

(On the Prophylaxis of Hereditary Syphilis and its Eugenic Effect).

Dr. Hallopeau, Professeur à la Faculté de Médecine.

Discussion.

10·45 a.m. "Alkohol und Eugenik."

(Alcohol and Eugenics).

Dr. Alfred Mjoën, Kristiania, Norway.

11·10 a.m. "Alcoholisme et Dégénérescence."

Statistiques du Bureau central d'Administration des aliénés de Paris et du department de la Seine de 1867 à 1912.

(Alcoholism and Degeneracy).

(Statistics from the central office for the management of the insane of Paris and the Department of the Seine from 1867 to 1912).

Dr. Magnan, of the Asile Saint Anne, Membre de l'Academie de Médecine

Dr. Fillassier, Membre de l'Academie de Médecine.

(*As these two papers are on similar subjects they will be grouped and discussed together*).

Discussion opened by Dr. Archdall Reid.

12·15 p.m. "Rassenhygiene und Arztliche Gebürtshilfe."

(Eugenics and Obstetrics).

Dr. Agnes Bluhm, Berlin.

1 p.m.

LUNCHEON INTERVAL. [J]

[J] For arrangements see pages 10 and 27.

SECTION IV.

Medicine and Eugenics.

TUESDAY, JULY 30th.

AFTERNOON SESSION.

2·30 p.m. "Heredity and Eugenics in Relation to Insanity."

Dr. F. W. Mott, F.R.S., Pathologist to the London County Asylums.

(*This paper will be illustrated by Lantern Slides*.)

Discussion.

3·15 p.m. "The Place of Eugenics in the Medical Curriculum."

H. E. Jordan,

Professor of Histology and Embryology, University of Virginia, and Chairman Eugenics Section American Breeders' Association for the Study and Prevention of Infant Mortality.

Discussion.

4 p.m. "The History of a Healthy, Sane Family showing Longevity, in Catalonia."

Valenti y Vivo,

Professor of Medicine and Toxicology, University of Barcelona Spain.

FAREWELL ADDRESS.

By the President.

[P19]

THE EXHIBITION.

The Exhibition in connection with the First International Eugenics Congress will include—(1) Charts, pedigrees, photographs, and specimens illustrative of Heredity, especially in man. (2) Relics of Charles Darwin, Sir Francis Galton and Gregor Mendel. (3) Portraits of Notable Workers.

The Committee desires to make the Exhibition as fully representative as possible of the past history and present state of the sciences of Heredity and Eugenics.

Many interesting exhibits have been received from America, France, Germany and all parts of the United Kingdom.

Professor von Gruber has sent over from the International Race Hygiene Congress, held in Dresden, in 1911, a collection of exhibits representative of German work.

The American Eugenics Record Office is sending an important exhibit, as are also the State Epileptic Colony of New Jersey, and Dr. Goddard, of Vineland.

Among the British Exhibitors are Major Leonard Darwin, Professor Punnett, Mr. Wheler, Mr. Whetham, Mr. Nettleship, Mr. E. J. Lidbetter and many others.

An Illustrated Catalogue is in preparation, and will be on sale at the Book Stall.

Many of the Exhibitors have signified their intention of attending the Congress, and their willingness to explain their exhibits to enquirers.

[P20]

MEMBERS OF GENERAL COMMITTEE.

Sir James Barr, M.D., F.R.C.P., F.R.S.E.
Sir Edward Brabrook, C.B.
Sir James Crichton-Browne, F.R.S.
Rev. R. J. Campbell, M.A.
Lady Ottoline Morrell.
F. W. Mott, M.D., F.R.C.P., F.R.S.
G. P. Mudge, F.Z.S.
Professor A. Niceforo.
Mrs. J. Penrose.

The Hon. Sir John Cockburn, K.C.M.G., M.D.	Mrs. E. F. Pinsent.
Montague Crackanthorpe, K.C.	Dr. A. Ploëtz.
R. Newton Crane, M.A.	Mrs. G. Pooley.
A. E. Crawley, M.A.	Professor E. B. Poulton, LL. D., D.Sc. F.R.S.
Sir Henry Cunningham, K.C.I.E.	Professor R. C. Punnett, M.A.
Francis Darwin, Sc.D., M.B., F.R.S.	Walter Rea, M.P.
Dr. C. B. Davenport.	G. Archdall Reid, M.B., F.R.S.E.
Dr. Langdon Down.	John Russell, M.A.
Havelock Ellis.	Ettie Sayer, M.D.
The Hon. Sir John Findlay, K.C.M.G., LL.D.	C. G. Seligmann, M.D.
Professor J. J. Findlay, M.A.	Professor Arthur Schuster, Ph.D., D.Sc. F.R.S.
Dr. Wilfred Hadley.	Edgar Schuster, M.A., D.Sc.
Mrs. H. N. C. Heath.	F. C. S. Schiller, M.A., D.Sc.
Admiral W. H. Henderson.	Lady Henry Somerset.
Monsieur Huber.	Dr. J. W. Slaughter.
The Very Rev. The Dean of St. Paul's, D.D.	W. C. Sullivan, M.D.
Dr. David Starr Jordan.	Professor J. A. Thomson, M.A.
R. Dixon Kingham, B.A.	A. F. Tredgold, L.R.C.P.
Miss Kirby.	Mrs. Alec Tweedie.
J. Ernest Lane, F.R.C.S.	W. C. D. Whetham, M.A., F.R.S.
The Rev. Hon. Edward Lyttelton, M.A.	Arnold White.
Lady Owen Mackenzie.	A. Gordon Wilson, M.D., F.R.C.S.
W. C. Marshall, M.A.	P. von Fleischl, Hon. Treasurer.
Colonel Melville, R.A.M.C.	Mrs. Gotto, Hon. Secretary.

EXECUTIVE COMMITTEE.

Major L. Darwin, *President*.
Paul Von Fleischl, *Hon. Treasurer*.
Mrs. Gotto, *Hon. Secretary*.
H. B. Grylls, *Secretary of the Exhibition*.
Professor Punnett.
Dr. E. Schuster.
Dr. Tredgold.

RECEPTION COMMITTEE.

Her Grace the Duchess of Marlborough.
The Rt. Hon. the Lord Mayor of London.
Lady Aberconway.
Mr. Newton Crane.
Mrs. Leonard Darwin.
Mrs. A. C. Gotto.
Mrs. Whitelaw Reid.
Mrs. Alec-Tweedie, *Hon. Secretary*.

DELEGATES. [K]

[P21]

[K] *As Delegates are daily being appointed this list is necessarily quite incomplete, only those appointments made before June 15th being included.*

American Breeders' Association	Professor V. L. Kellogg. Bleecker van Wagenen.
Assistance Nationa	Monsieur Cassiano Veves.
Board of Education	Sir George Newman, M.D.
Borough of Holborn	Councillor A. Chapman.
Borough of Ealing	Councillor Farr.
Borough of Shoreditch	Councillor J. Timmins, M.W.B.
British Womens' Emigration Association	Mrs. Ross
British Constitution Association	Mr. W. H. Southon.
British Academy	Rt. Hon. A. J. Balfour.
Cheltenham Ladies' College	Dr. Eveline Cargill.
Commonwealth of Australia	Sir John Cockburn, K.C.M.G.
Education Department, Wakefield	Alderman Hinchliffe.
Entomological Society of London	Professor W. Bateson.
Eugenics Education Society of New Zealand	Dr. Emily Siedeberg.
Folk-Lore Society	Sir Edward Brabrook.
French Republic	Monsieur Lucien March, Directeur Statistique

	Générale de la France.
Incorporated Association of Assistant Masters in Secondary Schools	Mr. F. Charles.
L'Académie de Médecine	M. le Prof. Pinard.
Linnean Society	Professor W. Bateson.
Liverpool Biological Society	Mr. R. D. Laurie.
Local Government Board	Dr. Arthur Newsholme.
London County Council	Mr. A. O. Goodrich. Sir John McDougall.
Metropolitan Asylums Board	Mr. Walter Dennis.
Metropolitan Borough of Finsbury	Dr Lauzun-Brown.
Metropolitan Borough of Wandsworth	Alderman Major M. Robinson, L.M.D.
National League for Physical Education and Improvement	Colonel T. H. Hendley, C.I.E.
National Hospital for the Paralysed and Epileptic	Dr. Risien-Russell.
National Service League	
National Society for Epileptics	Mr. G. Penn Gaskell.
National Union of Teachers	Mr. C. W. Crook.
Newport Elementary Education Committee	Dr. J. Lloyd Davies. Councillor Peter Wright.
North London or University College Hospital	[P22]
Nurses' Social Union	Mrs. Barnes.
Parents' National Education Union	Miss E. Parish. Miss M. Franklin.
Prudential Insurance Co., of America	Mr. Frederick Hoffman.
Ranyard Nurses	Miss Zoë L. Puxley.
Royal Anthropological Institute	Dr. Seligmann.
Royal University of Athens	Professor André Andreadis.
Royal College of Surgeons	Mr. G. H. Makins, C.B.
Royal Society of Medicine	Sir George Savage, M.D.
Royal Statistical Society	Dr. Dudfield.
Royal Surgical Aid Society	Mr. Henry Allhusen. Rev. Professor Green.
Société Nationale des Professeurs de Français en Angleterre	Monsieur A. Perret.
Society of Women Journalists	Mrs. Bedford Fenwick.
Society of Medical Officers of Health	Dr. A. Bustock-Hill.
St. Pancras School for Mothers	Lady Meyer, Mr. Warden.
Union des Associations Internationales, Brussels	Madame van Schelle.
University of Barcelona	Professor I. Valenti Vivo.
University of Bristol	Professor C. Lloyd Morgan, F.R.S.
University of Edinburgh	Rt. Hon. A. J. Balfour.
University of Glasgow	Dr. W. E. Agor.
University of Minnesota	Professor S. G. Smith.
University of Oxford	Dr. Edgar Schuster, M.A.
University of St. Andrews	Professor Edgar (or) Dr. Heron.
University of Sydney	Professor A. Stuart, M.D.
Urban District of Finchley	Councillor Royston.
Willesden Urban District Council	Councillor Riley.
Women's Freedom League	Mrs. Clarke.

[P23]

First

International Eugenics Congress

LONDON, WEDNESDAY, JULY 24th—TUESDAY, 30th, 1912.

To THE SECRETARY, EUGENICS EDUCATION SOCIETY,

6, York Buildings, Adelphi, London, W.C.

Kindly enrol my name as — a MEMBER[L] / an ASSOCIATE[M]

of the First International Eugenics Congress — for which I herewith enclose my fee. / for which I will pay on arrival. (*Cross out one of these lines*).

Name _____

Profession _____

Address in full _____

_____

(*Kindly write clearly.*)

The foregoing data are requested at your earliest convenience, so that they may be included in the official list of the Congress.

Fees may be paid either by cash, postal money order or cheque, to the Assistant Treasurer—

Miss E. Sellar,
6, York Buildings,
Adelphi, London, W.C.

N.B.—Only Members paying in advance will be able to avail themselves of the reduced Railway fares, as in all cases the Congress Voucher must be produced before the ticket will be issued.

[L] The Membership fee is one pound sterling, equivalent to twenty-five francs, twenty marks, twenty-eight pesetas, or ten dollars Mexican currency.

[M] The Associate Membership fee is ten shillings, equivalent to thirteen francs, ten marks, fourteen pesetas, or five dollars Mexican currency.

INAUGURAL BANQUET. [P25]

APPLICATION FORM.

To the Hon. Secretary, Entertainments Committee.

Please send me one Ticket for my own use (and one for a guest[P]), Seven Shillings and Sixpence (10 frcs.) each, for the Inaugural Banquet of the First International Eugenics Congress to be held at the Hotel Cecil, Strand, at 7 p.m., July 24th. I enclose £ s. d.

Name _____
(Member of the Congress).

Address _____

_____

N.B.—This form should be sent immediately to the Hon. Secretary, Entertainments Committee, 30, York Terrace, Harley Street.

[P] *Strike out if not wanted.*

LUNCHEONS. [P27]

A List of some Restaurants within easy reach of the University.

Open-Air Café, Kensington Gardens	5 minutes walk.	à la Carte (Reasonable Charges).
Imperial Restaurant, 24, Alfred Place	5 "	⅙ Table d'Hôte.
A.B.C. Depôt,		

32, Alfred Place (Adjoining South Kensington Tube Station).	5	"	à la Carte (Popular Prices).
Lyon's Depôt, Gloucester Road	7	"	"
Royal Palace Hotel, Kensington Gardens	8	"	Special ⅞ Table d'Hôte to Members of Congress or à la Carte.
Lyon's Depôt, Brompton Road	8	"	à la Carte. (Popular Prices).
Harrods' Stores, Brompton Road	12	"	2/- Table d'Hôte or à la Carte.

Transcriber's Note

The book cover image was created by the transcriber from the title page of this publication and is placed in the public domain.

Minor typographical errors were corrected. Some unmatched double quotation marks were left unchanged because it was not clear where the missing quotation marks should be.

The following changes were made:

Abstracts of Papers
p. 5: dolicomorphic => dolichomorphic

Programme
p. 16: Handwritten correction of 9:30 **a.m.** to 9:30 **p.m.** under Entertainments
P. 17: [Greek: geêêaô] not a word! => [Greek: gennaô] = birth

Transcription of Table N1.

	GENERATIONS									
	I	IC	II	IIC	III	IIIC	IV	IVC	V	TOTALS
PERSONS CHARTED	1	1	7	18	125	82	384	68	136	822
" OF MATURE AGE	1	1	6	18	118	82	237	68	8	539
ABILITY--LITERARY	1		5	5	30	6	31	2	1	81
MUSICAL		1	1	9	14	27	1	4		57
ARTISTIC		1		4	2	7	1			15
CONSTRUCTIVE	1		2	2	16	3	15	3	2	44
VARIOUS		1	2	3	36	10	9			61
TOTALS	2	1	11	11	95	35	89	7	7	258
NO SPECIAL ABILITY				3	8	1	2			14
ABILITY UNKNOWN				4	26	65	146	61	1	303
HEIGHT 5 FT. OR LESS						1	2			3
5-1 TO 5-2			1	3	2	1	2			9
5-3 TO 5-4		1	2	3	8	10	16			40
5-5 TO 5-6				2	14	9	12	2		39
5-7 TO 5-8			2	2	19	4	14	1		42
5-9 TO 5-10	1		1	1	9	2	10		1	25
5-11 TO 6-0				2	16	3	11	3		35
6-1 TO 6-2					3	1	4	1		9
6-3 TO 6-4					1					1
TOTALS	1	1	6	13	72	31	71	7	1	203
UNKNOWN				5	46	51	166	61	7	336
WEIGHT 100 LBS. OR LESS				2	1	2	2		1	8
101 TO 120				1	10	10	11		1	33
121 TO 150		1	1	6	28	10	27	4	1	78
151 TO 170	1		3	4	23	5	11	6		47
171 TO 200			2	4	7	3	5	6		27
201 TO 220					3	1				4
221 TO 250					1		2			3
TOTALS	1	1	6	17	73	31	58	10	3	200
UNKNOWN				1	45	51	179	58	5	339

	GENERATIONS									
	I	IC	II	IIC	III	IIIC	IV	IVC	V	TOTALS
HEALTH--EXCELLENT	1	1	6	3	34	15	131	6	44	241

GOOD			7	42	16	54	4	18	141
FAIR			3	3	4	8			18
DELICATE			1	2		4			7
POOR			1	7	2	11			21
TOTALS	1	1	6	15	88	37	208	10	62	428
UNKNOWN			3	24	45	147	58	71	348
DIED UNDER ONE YEAR				8		16		2	26
1 TO 5 YEARS			1	5		13		1	20
6 TO 25 YEARS				11		11			22
26 TO 40 YEARS				3					3
41 TO 70 YEARS		1		2	5	2			10
PAST 70 YEARS			1	3					4
AGE UNKNOWN		1	2	5	2	1	1			12
TOTALS	1	1	2	7	37	4	41	1	3	97
CAUSE OF DEATH										
PREMATURE BIRTH					1		5			6
INFANTILE COMPLAINTS			1		11		13		3	28
DIPHTHERIA					3		5			8
SCARLET FEVER							2			2
MEASLES					1					1
TYPHOID FEVER					2		2			4
PNEUMONIA				1	6	1	1			9
CONSUMPTION					2					2
OPERATIONS					1					1
CHILD BIRTH					1		1			2
VARIOUS		1	1	6	6		9			23
UNKNOWN	1				3	3	3	1		11
TOTALS	1	1	2	7	37	4	41	1	3	97

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