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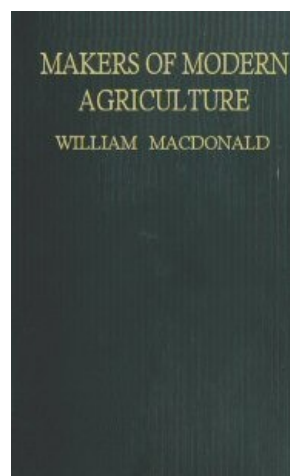
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MAKERS OF MODERN AGRICULTURE



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Jethro Tull
Founder of the Principles of Dry-Farming.
1674-1740.

MAKERS OF MODERN AGRICULTURE

BY

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When it is remembered what a prominent part Agriculture plays in the history of all Nations, it does seem strange that so little is known of the lives of those pioneers who have been foremost in the discovery of fundamental principles, improved methods, and labour-saving machines. Perhaps it is that farmers as a whole are not specially fond of reading. This, however, is not to be wondered at, because after a long day's work in the open air it is hard to rivet one's mind on anything more serious than the headlines of a daily newspaper, or the rose-tinted pictures of a rural magazine. Still, it is safe to prophesy that the successful farmer of the future will not only be a hard worker, but also a hard reader. And biography brings before us, in a vivid manner, the onward march of modern Agriculture.

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It is also of interest to note how much Agriculture owes to men who could scarcely be called practical farmers. Indeed, the author has been impressed, contrary to common opinion, with the success of the Townsman who takes to farming. But this is really no more surprising than that the simple-hearted farm lad should forsake the Old Homestead for the fascinations of the City, and by reason of his character, courage, and industry, become in a few years the Captain of some great commercial enterprise. There will always be the ceaseless ebb and flow of the human tide between country lane and crowded street. But it is surely our plain duty to do something to make the life of the worker in the field less dull and lonely, and more attractive by the erection of pleasant cottages and the establishment of rural industries: while, at the same time, we try to brighten the life of the toiler in the town by freehold garden lots and sunlit, open spaces.

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I desire to thank the Editors of the several papers in which these Sketches have appeared for kind permission to republish them in book form: The *Graphic* (Chapter I), The *Star*, Johannesburg (Chapter II), the *Rand Daily Mail* (Chapters III and IV), and the *Sunday Post* (Chapter V). To the *Journal* of the Royal Agricultural Society of England, I am indebted for the frontispiece (Jethro Tull), as well as for much valuable information.

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"One comfort is, that Great Men, taken up in any way, are profitable company."—CARLYLE.

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MAKERS OF MODERN AGRICULTURE

CHAPTER I

JETHRO TULL : FOUNDER OF THE PRINCIPLES OF DRY-FARMING

"For the finer land is made by tillage the richer will it become and the more plants will it maintain."—JETHRO TULL.

Eight miles to the north-west of Reading, on a lovely reach of the River Thames, lies the parish town of Basildon, in the County of Berkshire. Here, in the year 1674, was born the man who revolutionized British agriculture and laid the foundations for the "Conquest of the Desert." Yet, strange as it may seem, until the other day Tull's grave was unknown, and even now no monument marks the resting-place of this illustrious husbandman. His family was of ancient and honourable lineage, and he was heir to a competent estate. At seventeen he entered his name on

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the register of St. John's College, Oxford; but he did not proceed to a degree. Two years later he was admitted as a student of Gray's Inn, and was, in due course, called to the Bar. It is probable that Tull studied law not so much with the thought of taking it up seriously as a profession, but simply in order to better fit himself for a political career. Ill-health, however, made him turn his attention to farming. At the age of twenty-five he married a lady of good family, Miss Susanna Smith, of the County of Warwick, and then settled down to farm in Oxfordshire.

His first farm was Howberry, in the parish of Crowmarsh. The land of this farm was fertile and renowned for heavy crops of both wheat and barley. Here Tull lived and toiled for nine years, till at last his health broke down and he was ordered south to the milder climate of France and Italy. So he decided to sell a portion of his Oxfordshire estate and send his family to another farm in Berkshire named "Prosperous," situated in the parish of Shalbourne. After an absence of three years Tull returned to "Prosperous Farm"—a place for ever famous in the annals of agriculture. Here he lived for twenty-six years to the close of his strenuous, chequered career. Of this farm, Tull writes: "Situated on a little chalk on one side and heath on the other, the soil is poor and shallow—generally too light and too shallow to produce a tolerable crop of beans. This farm was made out of the skirts of others; a great part was a sheep down with a full reputation of poverty."

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While in Europe Tull took special note of the deep and careful cultivation of the vineyards, where the tillage of the soil between the rows of the grape vines was made to take the place of manuring the land. On his return to England he tried this method at "Prosperous Farm," first with turnips and potatoes, and then with wheat. And by adopting this simple system with some few modifications of his own, he was enabled to grow wheat on the same fields for thirteen years continuously without the use of manure.

It was on his farm of Howberry that Tull invented and perfected his drill in the year 1701. He has told the story of this invention in the pages of his great work. Finding his plans for growing sainfoin^[1] hindered by the distaste of his labourers for his new methods, he resolved to try to "contrive an engine to plant St. Foin more faithfully than such hands would do. For that purpose I examined and compared all the mechanical ideas that ever had entered my imagination, and at last pitched upon a groove, tongue, and spring in the sound-board of the organ. With these, a little altered, and some parts of two other instruments, as foreign to the field as the organ is, added to them, I composed my machine. It was named a drill, because, when farmers used to sow their beans and peas in channels or furrows by hand, they called that action drilling." And thus Tull's drill, taken from the rotary mechanism of his favourite organ, is the pioneer of all modern planters. His first invention was what he termed a *drill-plough* to sow wheat and turnip seed three rows at a time.

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[1] A leguminous plant cultivated for fodder.

It was this invention that led Tull to enunciate his first principle of tillage, namely, *drilling*. And it is the more amazing to reflect that even after this long lapse of time many farmers still persist in broadcasting their seed; for, as a recent authority working on the semi-arid lands of Montana writes: "Sowing broadcast is bad at any time, but in dry-farming it is suicidal." That the use of the drill has everywhere effected an enormous saving of seed is common knowledge; but let us hear what Tull has to say under this head: "Seed (sainfoin) was scarce, dear, and bad, and enough could scarce be got to sow, as was usual, seven bushels ^[1] to an acre. I examined and thought the matter out, and found the greater part of the seed miscarried, being bad, or too much covered. I observed, and counted, and found when much seed had miscarried the crop was best." Here was his second principle, *reduction of seed*, or, as we now say, "thin-seeding," a practice which has been adopted by the dry-farmers of Utah with remarkable success.

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[1] At the present time it is customary to sow from 80-100 lb. of sainfoin seed per acre.

Moreover, Tull was an ardent advocate of the weedless field, and he saw, clearly enough, that dung was a serious menace to clean tillage, as the seeds of troublesome weeds were apt to be scattered far and wide over the farm. This led him to lay down as his third principle—the *absence of weed*. But he certainly never, as is sometimes said, condemned the use of manure. His experiments, however, proved beyond the shadow of doubt that good crops might be grown simply and solely by means of deep and constant tillage. So he says, angrily: "The vulgar in general believe that I carried my farmyard dung and threw it in a river. I have no river near; besides, my neighbours buy dung at a good price; but it is known I neither sell nor waste any dung. Against such lying tongues there is no defence."

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Nevertheless, many years after his part was taken by none other than the great scientist of Rothamsted, the late Sir John Lawes, who wrote as follows:—

"Tull was quite an original genius and a century in advance of his time. I consider he has been most unjustly accused of not placing sufficient value upon farmyard manure; he advocated cleanliness, and saw that dung was a great carrier of weeds. To give some clear idea of the value of Tull's advocacy of drill-husbandry and the freedom from weed which can alone be obtained by the use of the drill, I may mention that so far as statistics will allow, I have ascertained the average yield of the wheat crop of the world, and I am able to say that the average yield is less than it is at the present time upon my permanent wheat land, after more than sixty years absolutely without manure. Here we have the result of Tull's three great principles—*drilling, reduction of seed, and absence of weed*. If he were alive now and were writing for the agriculture of the world, he would, I think, be quite justified in saying everything he said in regard to

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cleanliness and manure."

As a result of his studies, travels, and experiments, Tull published "The New Horse-Hoeing Husbandry: or an Essay on the Principles of Tillage and Vegetation" in the year 1731. The great value of this work is that it is founded not upon mere theory, but upon actual experiments in the field. The fourth edition, which I have beside me, consists of 426 pages, with several plates, and 23 chapters which treat of the following subjects: Of Roots and Leaves; Of Food of Plants; Of Pastures of Plants; Of Dung; Of Tillage; Of Weeds; Of Turnips; Of Wheat; Of Smuttiness; Of Lucerne; Of Change of Species; Of Change of Individuals; Of Ridges; Old and New Husbandry; Of Ploughs; The Four-Coulter'd Plough; Of the Drill-Boxes; Of the Wheat-Drill: Of the Turnip-Drill; Of the Hoe-Plough; with an appendix concerning the making of the drill and the hoe-plough.

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Tull's idea—which was that by tillage soils might be constantly and for ever reinvigorated or renewed—is summed up in his famous epigram, "tillage is manure." He believed that the earth was the true and the sole food of the plant, and, further, that the plant feeds and grows by taking in minute particles of soil. And since these particles are thrown off from the surface of the soil grains, it followed, therefore, that the more finely the soil was divided the more numerous the particles and the more readily the plant would grow. Although Tull's theories were wrong, his practice has been followed by all progressive farmers down to the present time. We now know that plants do not absorb particles of earth, but take in food in solution. Consequently, the more the particles of soil are broken up and refined, the more plant food the roots can absorb. In this volume, which must be counted an agricultural classic, Tull at once takes rank as the foremost preacher of his time of the gospel of deep and perfect tillage. And it is a work which, in the words of his great compeer, Arthur Young, will "unquestionably carry his name to the latest posterity."

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The botanical world has recently been illumined by the splendid discovery of the principles of heredity set forth by Gregor Mendel, and the foremost exponent of the new science, Professor Bateson, writes as follows: "We have at last a brilliant method and a solid basis from which to attack these problems, offering an opportunity to the pioneer such as occurs but seldom even in the history of modern science." Cannot we, as agriculturists, say the same with equal truth? For, to our thinking, Jethro Tull bears the same relation to dry-farming that Mendel does to plant-breeding. For if, on the one hand, his drill-ploughs are the models from which have been derived the marvellous agricultural machines of modern times, then, on the other, his clean husbandry, his seed selection, his deep and constant tillage are the fundamental principles in the great new science of dry-farming. Nor should we forget that both Mendel and Tull enunciated their principles only after long and patient experiment.

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The principles which we have adopted in our experiments on the Government Dry-Land Station at Lichtenburg, in the Transvaal and which we propose to follow on all stations hereafter to be established in the Union of South Africa, are seven in number, namely: (1) Deep ploughing; (2) drilling; (3) thin seeding; (4) frequent harrowing; (5) weedless lands; (6) few varieties; and (7) moisture-saving fallows. And we know full well that the more faithfully we adhere to this scheme the richer shall be our harvests. But, after all, these principles are merely the amplification, nothing more, of those fundamental methods of tillage so plainly set forth, one hundred and eighty-two years ago, by the genius of Jethro Tull.

Tull died in the month of March, in the year 1740, at the age of sixty-six. In speaking of agricultural education we have frequently urged the benefits to be derived from a liberal education, and we like to recall Tull's own words: "I owe my principles and practice originally to my travels, as I owe my drill to my organ." Here indeed, was a man of many parts—a famous agriculturist, an able mechanic, a good musician, and a keen classical scholar. His life, strange to say, was one dauntless struggle with disease. For six years he scarce ever left his room, and seldom in that period was he gladdened by so much as a glimpse of his "hundred acres of drilled wheat." So they laid the tired body of the simple-minded English squire under the yew-trees of Basildon in the mellow soil he loved so well. But the bells of the old church of Saint Bartholomew now ring out with a new, glad message, for they tell the toiling husbandmen of all lands to be of good cheer, for the desert shall rejoice and blossom as the rose; while the winds and the waters carry the echo of Tull's name down through the corridors of time.

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CHAPTER II

COKE OF NORFOLK: FATTIER OF EXPERIMENTAL FARMS

"Seest thou a man diligent in his business? He shall stand before Kings; he shall not stand before mean men."

At the beginning of this article we have quoted a text taken from the Proverbs of Solomon, which we believe can be applied more truthfully to the subject of our paper than to any other

name conspicuous in the annuals of agriculture. For he was a man diligent in his business and he stood before Kings.

Thomas William Coke, of Holkham (Holy Home), Earl of Leicester, was the eldest son of Robert Wenman. He was born in the year 1752, and educated at Eton, after which he travelled abroad. On the death of his father, Coke was elected in his place as member of Parliament for the County of Norfolk. He was then in his twenty-second year. He entered the youngest member; his political career extended over a period of fifty-seven years, and he finished up as "Father of the House of Commons." His domestic life was singularly happy—very different from the sad state of his great contemporary Arthur Young. In 1775 he married his cousin, Jane Dutton, by whom he had three daughters. After her death in 1800 he remained a widower for twenty-one years and then at the age of sixty-eight wedded a girl of eighteen, Lady Anne Keppel, by whom he had five sons and one daughter. Coke had the unique experience of being offered a Peerage seven times under six different Prime Ministers, and he was the first commoner raised to the Peerage by Queen Victoria on her accession to the Throne. In this connection an amusing story is told. In the year 1817 Coke was called on to present, at a Levee, a very forcible address to the Prince of Wales, who was then acting as Regent, praying him "to dismiss from his presence and Council those advisers, who, by their conduct, had proved themselves alike enemies to the Throne and the people." The Regent was warned of the proposal. Knowing that Coke valued his position as a Commoner above everything else, he declared with an oath that: "If Coke of Norfolk enters my presence, by God, I'll knight him." This speech was repeated to Coke. "If he dares," was the rejoinder, "by God I'll break his sword."

Part of the estate or Holkham was formerly a series of salt marshes on the coast of the North Sea. And when Coke came into his property in 1776—a fateful year in the history of the British Empire the surrounding district was little better than a rabbit-warren, with long stretches of shingle and sand. Soon after Coke's marriage, when his wife remarked that she was going down to Norfolk, the witty old Lady Townshend said, "Then, my dear, all you will see will be one blade of grass and two rabbits fighting for that." The story of how Coke came to be a practical farmer is told in the third volume of the Journal of the Royal Agricultural Society of England, published in the year 1842. The article containing it was written by Earl Spencer, and is of special interest as he had it direct from the lips of Mr. Coke (then Lord Leicester) a short time before his death. When Coke entered into his heritage, he found that five leases were about to expire. These farms were held at a rental of 3s. 6d. an acre; and in the previous leases they had been valued at 1s. 6d. an acre. At that time the agriculture of Norfolk was of the poorest character; and we may judge of the quality of the Holkham land by comparing it with the average rent of 10s. an acre which Arthur Young says prevailed at this time. Coke sent for the two tenants, Mr. Brett and Mr. Tann, and offered to renew their leases at a slightly higher figure, namely 5s. an acre. Both refused; and Mr. Brett jeered at the suggestion, saying that the land was not worth even the 1s. 6d. an acre which had originally been paid for it. This curt refusal was enough for a man of Coke's temperament. He forthwith decided to farm the land himself. It was thus that a young man of twenty-two, possessor of a princely fortune, fresh from the salons of Europe, suddenly turned his back on a gay and fashionable world; and stung into action by the laughter of a lazy tenant, took up the management of a sterile farm, raised a parish from poverty to affluence, transformed a desolate county into a cornfield, and left a name renowned in the annals of English agriculture.

In the history of agriculture, the name of Coke is chiefly remembered by those famous gatherings locally known as "Coke's Clippings." These wonderful meetings began in a simple way with the clipping or shearing of sheep, but soon came to embrace the whole realm of the rural industry. As might be imagined, when Coke took over the management of his farms, he had not the slightest knowledge of the science and practice of agriculture. So he called together his neighbours and frankly asked their advice.

They in turn were doubtless glad to meet a young man so keen and so eager to learn. Soon they brought their friends and their relatives, and two years later these little country gatherings had assumed a more definite character, and were thereupon called "Coke's Clippings." Soon agriculturists from all parts of Great Britain wrote to ask if they might attend. Swiftly and steadily the fame of the "clippings" grew, till presently scientific and other celebrated men from the United States and the Continent travelled to England to take part in these meetings. Year by year they increased in numbers till at last they embraced every nationality, every profession, and every rank in life, from Royalty to the poorest peasant. Holkham had, in fact, become a great experimental farm—a private estate turned by the enterprise of its owner into a public institution. Nowadays, we are familiar with State experimental farms, which are visited by thousands of farmers once or twice a year. But a century ago such a thing was unheard of, and Coke may justly be termed the "Father of the Experimental Farm." At these shearings Coke presented many cups and prizes for the invention of any new agricultural implement, for suggestions with regard to improved systems of cropping, of irrigation, of enriching the soil, and for articles on agricultural subjects—in a word, to every one who contributed to advance any branch whatsoever of the agricultural industry. Moreover, we are told that at a meeting of 1803 sweepstakes were offered for guessing the correct weight of a wether. The winner was a certain Mr. Money Hill, who guessed the exact weight—130 lbs.; while a butcher named Rett was a good second, and he guessed the weights of four other sheep within one pound. It is said that, one year, there died on the Holkham estate a tenant who had won no less than £800 in prizes at the "clippings." Party politics were carefully excluded from these meetings, and any attempt to introduce a party spirit into the speeches at the annual dinners was at once silenced by Coke. As

a politician he was a prominent Whig, but as an agriculturist he sank his politics and opened his doors to men of merit irrespective of their views. Thus he gave Sir John Sinclair a magnificent goblet as a token of his appreciation of Sinclair's "Code of Agriculture," in spite of the fact that Sir John was a strong supporter of the "vile Tories and their viler head, Mr. Pitt." Sir John was pleased beyond measure and remarked, with a true Highland courtesy, that hitherto the most priceless heirloom in his castle had been the drinking cup of Mary Queen of Scots, but henceforth he would look on the goblet of his Whig friend as his greatest treasure.

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The last of "Coke's Clippings" took place in the year 1821. It was attended by seven thousand people, and lasted three whole days. There is something very pleasing in the account of this pastoral scene. A stately mansion in a splendid park, with a group of village maidens spinning flax, on a velvet lawn, in the midst of a vast concourse of people drawn from all parts of the earth. Punctually at ten o'clock in the morning, so we read, Miss Coke came on to the lawn, accompanied by her father, and the Duke of Sussex. Then after greetings taken and greetings given, the vast crowd proceeded, some riding, some driving, some walking, to inspect the different farms on the estate. The first day was given up to the study of the inoculated pasture, prize cattle, new implements, sheep-shearing amid farm crops. The second day was devoted to fresh fields, farm schools and cottage gardens. The third day was absorbed in the inspection of the carcasses of animals that had been slaughtered, speech-making, and the distribution of prizes. On that day at 3 p.m., seven hundred guests sat down to dinner, a mid-day meal, which, with the speeches and prizes lasted for seven hours! The historian of this period has left us an account of the most popular toasts at these annual banquets, such as "A Fine Fleece and a Fat Carcase," "The Plough and a Good Use of It," while the tribute to Coke's efforts to enclose all waste lands always brought down the house, for it wittily ran: "The Enclosing of all Waists," and Coke's own toast "Live and Let Live," was invariably greeted with tumultuous applause. The two annalists who have left us unimpeachable accounts of those memorable meetings are both agreed that Coke himself was the central figure. Dr. Rigby, in "Holkham and its Agriculture" (1818) writes: "He is everywhere and with everyone. He solicits enquiry from everyone." At each halt in the ride little knots of people collected round him and listened with absorbed interest to all he said, while for hours he thus sustained the character of leader, lecturer, and host. And the American Ambassador of that day, His Excellency Mr. Richard Rush, writes in "A Residence at the Court of London," "No matter what the subsequent advance of English agriculture or its results, Mr. Coke will ever take honourable rank among the pioneers of the great work. Come what will in the future, the Holkham sheep-shearings' will live in English rural annals. Long will tradition speak of them as uniting improvements in agriculture to an abundant, cordial, and joyous hospitality."

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When Coke started to farm in Norfolk the value of rotation was unknown. Then, it was customary to grow three white straw crops in succession followed by broadcast turnips. It was not to be wondered at that soil which consisted mainly of drifting sand and sharp, flinty gravel should soon become worn out. Coke changed this practice and grew only two white crops in succession and then let the land lie in pasture for the next two years. He began to manure heavily; and used rape-cake as a top dressing with marked success. Moreover, he found that the soil of almost the whole district was composed of very light sand and overlaid with a stratum of rich marl. Pits were opened, the marl dug out, and scattered over the surface of the land. This not only promoted fertility, but gave to the soil that solidity which is so essential to the growth of wheat, It was Coke's proud boast that he turned West Norfolk from a rye-growing into a wheat-growing district. But it took him eleven years before he could get wheat to grow on the poor, sandy soil of his own estate. Nevertheless, before he died, these so-called "rabbit and rye" lands were yielding as much as thirty-two bushels to the acre. His main idea was to stock heavily; more for the sake of manure than for the sake of meat. He pinned his faith on the motto: "Muck is the mother of money." And we are told that he was accustomed to say to his tenants, "If you will keep an extra yard of bullocks, I will build you a yard and sheds free of expense." He was a patient man but he was once heard to remark: "It is difficult to teach anything to adult ignorance. I had to contend with prejudice, an ignorant impatience of change, and a rooted attachment to old methods." He referred to the fact that the farmers still persisted in the old system of sowing cereals broadcast, or else laboriously made holes with a dibbing-iron into which the grain was dropped, while another man followed with a rake and covered up the holes. Thus he used the drill for sixteen years before any of his neighbours could be induced to adopt it; and even when the farmers began at last to see the benefit of this rapid manner of sowing, he estimated that its spread was only a mile each year. By-and-by, however, he noticed that a quaint term for a good crop of barley had come into use at Holkham. His farmers spoke of "hat-barley" for the reason that if a man throws his hat into a crop of barley, the hat rests on the surface if the crop is good, but falls to the ground if the crop is bad. "All sir," said his tenants at length, "is 'hat-barley' since the drill came."

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Coke was never tired of experimenting with every kind of crop. Cocksfoot (orchard grass) was cultivated with great success and numbers of sheep were fattened on it. On land, once considered worthless, he cut four hundred tons of sainfoin from one hundred and four acres. He early recognised the merits of swedes, and was the first to grow them on a large scale. He made a special study of birds in relation to the eradication of grubs. Finding a field of turnips infested with a larva which caused black canker he turned four hundred ducks into the field which they cleared of this pest in five days. Early in his career Coke discarded the native sheep of Norfolk, with backs as narrow as rabbits, in favour of the Southdowns, and gradually became one of the largest sheep-breeders in England. Encouraged by the Duke of Bedford, another eminent agriculturist, he started a herd of North Devons, and thereafter bred them with much success. He

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also improved the Suffolk breed of pigs by crossing them with the Neapolitan, thereby obtaining a superior quality of pork. Afforestation was one of his special hobbies. He fully realised the truth of the old saying that a tree is growing while its planter is sleeping. Every year he planted fifty acres of timber, mostly oak, Spanish chestnut, and beech, till he had three thousand acres of bleak, wind-swept country well covered. He permitted the poor of the neighbourhood to plant potatoes among his young trees for two or three years; a practice which kept his land clean and saved the expense of hoeing. And in the year 1832 he embarked in a ship built of oak from the acorns which he himself had planted.

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He always maintained that the interests of landlord and tenant were identical. In order, therefore, to encourage his tenants to exert themselves to the utmost, he let out his farms on long leases of twenty-one years at a moderate rental and burdened with but few restrictions. He soon saw, however, that in the case of an indolent tenant a long lease would mean the rapid deterioration of the property. It happened at this time that a certain farmer named Mr. Overman, who had been foremost in furthering the new agricultural schemes, applied for a farm on the Holkham estate. Coke allowed him, as an experiment, to draw up the covenants of his own lease. Overman straightway inserted a clause making the improved course of cropping compulsory. Coke was so pleased that he at once made this lease the model for all his other tenants with a few slight modifications. And so the land was fully protected from any possible injury through a long period of bad farming. By such improved methods Coke is said to have raised the annual rental of his estate from £2,200 to £20,000; while the yearly fall of timber and underwood averaged £2,700—a sum which exceeded the whole of his old rent roll. During his sixty-six years at Holkham he spent over half a million pounds sterling on improvements alone, without taking into account the large sums spent on his house, domain, and home-farm buildings. Yet it is averred that this vast outlay was all regained in due course. At that period the Holkham estate consisted of 4,300 acres in a ring fence, with a park of 3,500 acres surrounded by a ten-mile wall close to the sea. In a volume entitled "Agricultural Writers" (1200-1800) by Donald McDonald, the name of Coke does not appear. And it would seem that all he ever wrote were some papers for the "Annals of Agriculture" (Arthur Young), and a pamphlet on "An Address to the Freeholders of Norfolk."

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The biography of this remarkable man has recently been written in two brightly bound and lavishly illustrated volumes by Mrs. A. M. W. Stirling, under the title of "Coke and his Friends."^[1] His memory well deserved the laborious and loving tribute of his enthusiastic great grand-child. But to be of any practical value to the agriculturist, the book must be greatly condensed. Out of thirty-five chapters we can find only five which tell of his services to the agricultural industry. Out of a thousand odd pages we can find only one hundred and sixteen which bear on the science and practice of farming. Out of sixty-four carefully executed illustrations we can only find four which have anything whatsoever to do with rural affairs. It may be affirmed that Coke was much more than a mere agriculturist. That is very true; but surely his fame rests far more on his services to rural progress than on his reputation as a politician, a society leader, or a landlord. We therefore hope that at no distant date the same flowing pen which has produced the bulkier volumes will compile a handier life dealing altogether with Coke's agricultural doings. Coke died in 1842 at the age of eighty-eight, and was buried in the family mausoleum attached to the Tittleshall Church, Norfolk.

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[1] Published by Mr. John Lane, London.

In a life drama so vivid and forceful there are yet two vivid scenes we cannot fail to recall. It was Coke who brought forward the motion in the House of Commons to recognise the independence of the American Colonies. All night long the House sat. At 8.30 a.m., the end came. Amid breathless silence the result was announced 177 Noes, 178 Ayes. It was Coke who announced to the obstinate, discomfited King the result of that great debate, whereby the disastrous fratricidal war was forever ended and the independence of the United States acknowledged by the Parliament of the Mother Country, after nine bitter years, by a majority of one vote. The Parish of Burnham lies next to the Parish of Holkham. And the son of the rector of the former village, a fragile, delicate lad, used sometimes to join Mr. Coke's hounds when they were out coursing. But he was never asked to shoot, as only once had he been known to hit a partridge. One day this poor young man, returning from a two years' cruise paid a visit to his wealthy neighbour and stayed overnight. The great-uncle of his host built the mansion house of Holkham, and Thomas William Coke spent all his life and a large fortune in developing the family estate. But the British people placed Nelson, the frail and nervous guest, who slept that night in the humble turret-room, on the top of the Column in the centre of Trafalgar Square.

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CHAPTER III

ARTHUR YOUNG: AUTHOR OF THE AGRICULTURAL TOUR

"The magic of property turns sands into gold. Give a man the secure possession of a bleak rock, and he will turn it into a garden; give him a nine years' lease of a garden, and he will convert it into a desert."—ARTHUR YOUNG.

Arthur Young, the greatest of English agriculturists and the poorest of practical farmers, was born at Whitehall, London, in the year 1741. He was the youngest son of the Reverend Dr. Arthur Young, Prebendary of Canterbury Cathedral, Rector of Bradfield, and of Anne Lucretia, daughter of John de Cousmaker, a Dutchman who accompanied William of Orange to England. From his father Arthur inherited good looks and literary talent; and from his mother the love of learning and brilliant and pleasing speech. [Pg 40]

Mrs. Young brought her clerical husband a large dowry, much of which was swallowed up in the vortex of his debts, and later, on his death, in promoting the agricultural schemes of her gifted but unbusinesslike son. His home from the first, and for the most part of his life, was Bradfield Hall in the County of Suffolk—a property which had been in the hands of the Young family since the year 1672. After a visit to Bradfield, reached from Marks Tey on the Great Eastern Railway, you do not wonder at Young's early love of rural life. A broad, winding, elm-bordered road, meadows knee-deep in wild flowers and waving grasses, tangled hedges of eglantine and honeysuckle, rustling cornfields and silent woods—these, all these, were the sweet pathways to his home. [Pg 41]

At the age of seven the lad was sent to the Grammar School at Lavenham in order to learn the Greek and Latin languages, together with writing and arithmetic. Owing to the indulgence of a fond mother, his attendance at his classes was irregular, and neither the centurions of Cæsar nor the wooers of Penelope were able to beguile him from his pony, his pointer and his gun. But the cheapness of his board and schooling would delight the hearts of many parents in the Transvaal and elsewhere in the year of grace 1912. Here is the bill:—

"The Rev. Dr. Young to John Coulter (Master of Lavenham School), Xmas, 1750 to Xmas, 1751. A year's board, etc., £15. Sundries, £2 4s. 4d. Total, £17 4s. 4d."

On leaving Lavenham, he was apprenticed, at the wish of his mother, to a wine-merchant at Lynn. He deserted his new work. He was fond of music and the drama. He excelled in dancing, but was always a diligent scholar. [Pg 42]

His income, in those days, was not excessive, being thirty pounds per annum: but his foppery in dress deprived him of the means wherewith to purchase his beloved books. Accordingly, he wrote a pamphlet entitled "The Theatre of the Present War in North America," for which he received ten pounds' worth of books from the publisher. More balls compelled him to compile more political pamphlets in order to procure more books. In the year 1759, at the age of eighteen, he left the counting house at Lynn, as he tells us in his own words, "without education, pursuits, profession or employment." That same year his father died much in debt.

He next went to London and started at his own expense a monthly magazine called "The Universal Museum." It failed, and he returned home. All his wealth was now summed up in a freehold farm of twenty acres. His mother owned eighty acres at Bradfield. She persuaded him to reside with her and to manage the farm. He had no knowledge of agriculture, but he accepted, and tells the story in his own words: "Young, eager, and totally ignorant of every necessary detail, it is not surprising that I squandered large sums under golden dreams of improvement." At the age of twenty-four he married Miss Martha Allen of Lynn. One of his biographers says: "The marriage brought him an enviable connection—troops of friends, a passport into brilliant circles, but no fireside happiness. The lady was evidently of a captious disposition, shrewish temper and narrow sympathies." Another biographer writes: "A loving son, a devoted father, Young was an indifferent husband." [Pg 43]

Having failed to make a success of his first farm, Young, nothing daunted, undertook the cultivation of Sampford Hall in Essex. This farm consisted of 300 acres of good arable land. But want of practical knowledge, and want of capital, drove him from it, and after a five years' tenancy he paid a farmer £100 to take it off his hands. His successor made a fortune on it. But during these five years Young had made a large number of experiments, the results of which he afterwards published in two large volumes under the title of "A Course of Experimental Agriculture." Still unshaken in his love of the soil, he sought another farm, and the quest furnished materials for his "Six Weeks' Tour through the Southern Counties," a very popular work which ran through several editions. It was at this time that on the advice of his Suffolk bailiff he took a farm of one hundred acres at North Mimms in Hertfordshire. This property had a good house, but that seems to have been all. He was deceived by seeing it in a specially good season. This speculation proved worse than the last; but his picturesque pen never failed: "I know what epithet to give this soil. Sterility falls short of the idea—a hungry, vitriolic gravel. I occupied for nine years the jaws of a wolf." The simple fact was that whenever he put pen to paper he was successful; whenever he turned to practical farming he was a ruined man. [Pg 44]

He continued to write. His publisher called for more tours. His receipts were considerable, yet we find him recording: "No carthorse ever laboured as I did at this period, spending like an idiot, always in debt, in spite of what I earned with the sweat of my brow, and almost my heart's blood—the year's receipts £1,167." About this time he wrote "Observations on the Present State of the Waste Lands of Great Britain," and was elected a Fellow of the Royal Society. Finding that he could not make enough to live on at farming, he accepted an appointment as Parliamentary [Pg 45]

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Reporter for the "Morning Post" at five guineas a week—a most incongruous job for a farmer since it compelled him to be absent from his home during six days of the week. Yet he retained it for several years—walking seventeen miles down to his farm every Saturday evening and returning to London every Monday morning.

In the year 1784 Young began the publication of the "Annals of Agriculture"—a monthly publication which ran through forty-five volumes. These annals covered the whole field of Agriculture in the form of letters and essays from the most eminent ruralists of the age. But more than a fourth part of the whole series came from the editor's ceaseless pen. Even the King was persuaded to contribute two letters under the *nom de plume* of "Ralph Robinson," his Windsor shepherd. Young related with much pride that His Majesty said to him one day on the terrace of Windsor: "Mr. Young, I consider myself as more obliged to you than to any other man in my Dominions"; while the Queen observed that they never travelled without a copy of the "Annals" in the Royal carriage. These volumes created quite a stir in European circles, and from all parts of the Continent there flocked scholars to study at the feet of the Abeldard of English Agriculture. A year later Young's mother died and Bradfield Hall and farm became his property.

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If Tull was the founder of dry-farming, and Coke the father of the experimental farm, Young was unquestionably the author of the agricultural tour. From his fertile pen flowed "The Southern," "The Northern," and "The Eastern Tours," together with "The Tour in Ireland." The first three tours were translated into Russian by the express command of the Empress Catherine, who at the same time sent several young Russians to reside at Bradfield for instruction in British agriculture. It was his own opinion that the most useful feature of the tours was the practical information which they gave on the important subject of the correct courses of crops, on which all preceding writers had been silent. His most famous and most popular work was his "Travels in France during the years 1787, 1788 and 1789."

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Yet these remarkable journeys were fore-shadowed twenty years before in a little book he wrote entitled "The Farmer's Letters to the People of England," in which he says: "The nobility and men of large fortune travel, but no farmers; unfortunately, those who have this peculiar and distinguishing advantage, the noble opportunity of benefiting themselves and their country, seldom enquire or even think about agriculture."

Then comes a sketch of a farmer's tour with the routes laid down for the imaginary traveller, being precisely those roads he himself was to follow two decades later.

In the year 1787 he received a pressing invitation from a Polish friend in Paris to join the Count de la Rochefoucauld in a tour of the Pyrenees. "This was touching a string tremulous to vibrate," he writes: "I had long wished for an opportunity to examine France." His travels in France were the sensation of the hour. No one had done quite the same thing before. He was an eye-witness of the moving scenes which ushered in the French Revolution. His name was in everybody's mouth. He received invitations to Courts and salons. All the learned societies enrolled him as a member. His work was translated into a score of languages. Princes, statesmen, scientists, men of letters, simple farmers and plain peasants paid a visit to Bradfield. Among his correspondents we note the names of Washington, Pitt, Burke, Wilberforce, Lafayette, Priestly and Jeremy Bentham. So it happened that when the affluent Coke of Norfolk was holding a Continental sheep-shearing salon at Holkham, his indigent neighbour, fifty miles to the south, was holding a European levee to discuss the fundamental principles of rural economy.

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Four years later Young's heart was broken by the death of his favourite daughter, "Bobbin" at the early age of fourteen. He developed religious melancholia, shunned society, left his Journal blank and brooded over sermons. His sight began to fail. He was operated on for cataract. Wilberforce, warned to be careful, went, a week later, to see him in the darkened room. In his sweet and elegant voice the Great Emancipator spoke feelingly of the death of a mutual friend. Young burst into tears and became for ever blind. The remainder of his life was spent in preaching the Gospel to the peasantry and in works of charity. He died in the eightieth year of his age in Sackville Street, London, and was buried at Bradfield, April, 1820.

It is impossible in this brief article to do more than mention the writings of Young. These we must reserve for a subsequent paper. Our library is far from complete, yet we possess sixty-six volumes of his sparkling prose, which, placed one upon another, attain to a height of nine feet—a monument of amazing industry. True, he was not exempt from those petty jealousies which so often mar the character of eminent men. He tried to snatch some credit for the Board of Agriculture from Sir John Sinclair, and he scoffed at the idea that Jethro Tull had invented the corn-drill. He met and conversed with the greatest savants of the age, yet his mind never burst the old wine bottles which he served out in the Suffolk store. And so he arrogantly says that Canada and Nova Scotia are not worth colonising. "If they continue poor, they will be no markets. If rich they will revolt; and that perhaps is the best thing they can do for our interest." ... "The loss of India must come. It ought to come." Yet with all his foolish fancies what a splendid life! For he was the Prophet of the New Agriculture in the Valley of Dry Bones. And England may well write the epitaph of her illustrious son in the words of Ezekiel: "This land that was desolate is become like the Garden of Eden."

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CHAPTER IV

JOHN SINCLAIR: FOUNDER OF THE BOARD OF AGRICULTURE

One of the earliest recollections of the writer's childhood as he fished for trout in the Swiney Burn in the far North of Scotland, was the tale of a certain wonderful man that was wont to tie little shoes on the feet of his sheep in order to keep them warm while walking through the snow. But many a trout had to be caught, and many a ripple of the shining river had to pass beneath the Thurso Bridge ere he learned the name of the strange person who struck his childish fancy as he looked up from his quivering line into the wistful eyes of a Cheviot ewe on the lonely, wine-red, moor.

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Sir John Sinclair, the founder of the British Board of Agriculture, was born in Thurso Castle in the county of Caithness, on May 10th, 1754. His father, George Sinclair, the Laird of Ulbster, was a descendant of the Earls of Caithness and Orkney; while his mother, Lady Janet Sutherland of Dunrobin, was the sister of the sixteenth Earl of that name. As a child he was carefully and wisely trained by his parents. From his father, a man of literary tastes and deeply religious character, he inherited a love of books; and from his gentle mother, he learned the lesson that life is not an empty dream; and her lad was soon to be known as "the most indefatigable man in Europe."

John was educated at the Royal School of Edinburgh, and at the University of the same city which he entered at the early age of thirteen. He also studied at Glasgow, and at Trinity College, Oxford. He was called to the Bar in 1782. His father died suddenly when John was sixteen, and he found himself heir to Estates comprising some 100,000 acres, mainly bleak and barren moor. He at once began to improve his property.

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Scottish agriculture was then in a most backward state. The fields were unenclosed, the lands were undrained. The small farmers of Caithness were so poor that they could hardly afford to keep a horse, or even a Shetland pony. The burdens were chiefly borne by women. Indeed, according to Smiles, if a cottar lost a horse, it was not unusual for him to marry a wife as the cheapest substitute.

The country was without roads or bridges. Drovers taking their cattle to the South had to swim rivers alongside their beasts. The chief track leading into the country lay along the high shelf of a mountain called Ben Cheilt; the path being several hundred feet above the storm-tossed sea, which thundered on the rocks below.

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Imagine the loud laughter of the elders of this community when they heard a rumour that young Sinclair proposed to build in a single day a road over this hitherto impassable hill. But John surveyed the road himself, and ordered up the Statute labour. At that time the law decreed that all capable inhabitants of the agricultural class should work on the roads for six days in every year. And so, early one summer morning, he assembled the neighbouring farmers and their servants—a total of 1,260. Each party, on arrival, was assigned a certain piece of the path where they found tools and provisions awaiting them. At sunset of the same evening the youth drove his carriage and pair over six miles of mountain road which the night before had been a dangerous sheep-track. Tidings of this exploit by a stripling of eighteen spread far and wide, and spurred the sleeping spirit of the North.

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At the age of twenty-six, John Sinclair was elected member of Parliament for the county of Caithness, and remained in the House of Commons for upwards of thirty years.

The great monument to Sinclair's indefatigable industry is his "Statistical Account of Scotland" in twenty-one volumes, one of the most valuable works on agriculture ever published in any country. It took seven years and seven months of incessant labour to complete. It was then that the word "statistics" and "statistical" were first introduced into the English language by Sinclair. He made use of the clergy to obtain the information he desired. He sent a circular letter to each parish minister in Scotland with 160 questions under four heads: (1) Geography and Natural History. (2) Population. (3) Production. (4) Miscellaneous subjects.

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In the collection of data many difficulties occurred. Some of the clergy scorned the idea that one man could collect and collate all this information: others were lazy both in mind and body: and some were old and infirm. Several parishes were vacant, some too huge to fully cover, many were without roads, and not a few separated by tempestuous arms of the sea. To overcome these obstacles he enlisted the aid of the leaders of the Church of Scotland, of which he was a member, and the great landowners, and as a last resort he employed statistical missionaries to supply the missing information. He generously assigned all the profits of this publication to the Scottish Fund for the benefit of the sons of the clergy, and obtained for that Society a Royal grant of £2,000. Among the direct results of this work was the raising of the stipends of ministers and schoolmasters—surely a convincing reply to his critics in the manses—the abolition of what was then called thirlage or the compulsory grinding of corn at a particular mill. Charles Abbot, afterwards Lord Colchester, the originator of the census of England, wrote to Sinclair: "Your success suggested to me the idea," and the various bureaux of statistics in the United States and other countries can be directly traced to the influence of his treatise.

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In the year 1788 Sinclair founded the Wool Society. For some time he had been wondering why Shetland wool was so extremely fine. Meeting at the General Assembly in Edinburgh a Shetland minister, he put the question to him and obtained much valuable information which he

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at once laid before the Highland Society. This led him to form the British Wool Society. It was inaugurated by a grand sheep-shearing festival at Newhall's Inn, Queensferry, near Edinburgh, in the year 1791. To Sinclair, therefore, belongs the credit of initiating the sheep-shearing contests which a few years later developed into Coke's famous "clippings," and which were the precursors of our present agricultural shows. The first agricultural show was held by the Highland and Agricultural Society at Edinburgh in 1822. It was the Long Hill sheep of the East Border that Sinclair re-christened by the now famous name of Cheviot. These sheep soon became naturalised all over the north of Scotland, and in a short time the rent of sheep farms rose to fabulous prices. Pastures of little value under coarse-woolled sheep yielded large returns. As an illustration of the practical value of his improvements it may be mentioned that Sinclair's estate of Langwell, which he had bought for £8,000, he afterwards sold for £40,000: while the estate of Reay in Sutherlandshire was purchased at £300,000. The name Cheviot comes from the range of rounded or cone-shaped hills growing a superior pasture on the Scottish and English border.

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In the opening lines of this article I spoke of a childish tale about sheep-shearing. That this legend is not mere fiction may be seen in the following letter of Arthur Young (see Autobiography of Arthur Young, page 159): "From Sir J. Sinclair on clothing for sheep which he sent and desired me to buy. I did so, and the rest of the flock took them, I suppose, for beasts of prey, and fled in all directions, till the clothed sheep, jumping hedges and ditches, soon derobed themselves."

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In his third lecture in the "Crown of Wild Olives," Ruskin points out that all the pure and noble arts of peace are founded on war. It is worth while, therefore, to note that the British Board of Agriculture was established when Britain was engaged in the supreme struggle with France, which terminated on the field of Waterloo, that the National Department of Agriculture in the United States was inaugurated in the midst of the Civil War, and that the Transvaal Department of Agriculture was commenced ere peace was signed at Vereeniging. In the year 1793 Sinclair's services in restoring commercial confidence during the crisis which occurred at the outbreak of the French War were recognised by Pitt, who sent for him to come to Downing Street, thanked him on behalf of the Government, and asked him if there was anything that he desired. Sinclair replied that he sought no favours for himself, but the most gratifying of all would be the establishment by Parliament of a great National Corporation to be called "The Board of Agriculture." In due course the Board was successfully established with the King as Patron, Sinclair as President, and Arthur Young as Secretary. The annual Parliamentary grant was £3,000.

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In this brief review we have no space to follow the fortune of the Board to the date of the retirement of its inspiring founder, down to the time when it returned £42,000 to the Treasury—not knowing how to spend it—till it finally faded away in the year 1822. Yet the Board accomplished much imperishable work. It carried out agricultural surveys, published several volumes of "communications," promoted prize essays on rural topics, encouraged Elkington, the father of drainage, Macadam the road-maker, and Meikle, the inventor of the threshing machine, and arranged lectures by Sir Humphry Davy on agricultural chemistry, and by Young on tillage.

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The north of Scotland at that period owed much to Sinclair. In 1782 he saved the inhabitants from a serious famine by obtaining a Parliamentary grant of £15,000. In the same year, along with some other patriots, he secured the repeal of the law which for thirty-seven years—since the Rebellion of 1745—had forbidden the use of the kilt.

Sinclair was an enthusiastic tree-planter in a country which was once wittily described by an American visitor as a "Great Clearing." He rebuilt Thurso, and founded the herring fisheries at Wick. To ensure the success of this industry he imported Dutch fishermen to teach the Caithnessmen the art of catching and curing herrings. He introduced improved methods of tillage, a regular rotation of crops, and the cultivation of turnips, clover, and rye-grass. One of his many schemes was a General Enclosure Bill, his toast at agricultural gatherings being: "May a Common become an Uncommon Spectacle in Caithness."

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In 1786 his attachment to William Pitt was rewarded with a baronetcy. Sir John's domestic life was singularly happy. On referring to the old book already mentioned, we read: "He has been twice married to two of the most beautiful women in the island. His first lady, a Miss Maitland, died prematurely in the bloom of youth. His present lady is the daughter of the late Lord Macdonald, and by her he has a son, George, and other children."

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It cannot be doubted that Sir John loved the limelight, possessed an unbounded self-conceit, lacked the saving sense of humour, and over-estimated his own achievements. But these vanities were but the fitful smoke in the blue flame of a burning energy. What a lesson in industry for the youth of South Africa. Fifty years of ceaseless toil, author of thirty-nine volumes and 367 pamphlets. This Scottish agriculturist died in 1835 at the ripe age of eighty-one, and is buried according to an ancient family rite, in Holyrood Chapel at Edinburgh—the friend and confidant of three English kings.

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CHAPTER V

CYRUS H. McCORMICK: INVENTOR OF THE REAPER

"I expect to die in harness, because this is not the world for rest. This is the world for work. In the next world we will have the rest."—CYRUS H. McCORMICK.

It is hardly to be expected that those people who devoutly chant in a million churches the fourth sentence of the Lord's Prayer should think with gratitude of any other person than the Divine Giver of all Good. Yet it is strange to reflect that although every schoolboy knows something of the life of our least Poet Laureate, not one in ten thousand could tell you the career of the man who responded in a truly miraculous manner to the heartfelt, world-voiced matin of both rich and poor, "Give us this day our daily bread."

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Cyrus H. McCormick, the inventor of the reaping machine, was born in the eventful year 1809. It was the birth year of Darwin and Tennyson, of Mendelssohn, Gladstone, and Lincoln. He was born on Walnut Grove Farm, amidst the mountains of Virginia, one hundred miles from the sea. He came of that virile stock that has proved to be the main strength of the Republic, that gave Washington thirty-nine of his generals, three out of four members of his Cabinet, and three out of the five judges of the Supreme Court—the Scots who migrated to Ulster, and thence to the United States. Robert McCormick, the father of Cyrus, was a fairly large farmer, and an inventor of no mean ability. The little log workshop is still shown to the enquiring tourist where father and son moulded and mended machinery on many a rainy day. Indeed, we are told that the McCormick homestead was more like a small factory than a farmer's home, so full was it of rural industries—spinning and weaving, soap and shoes, butter-making and bacon-curing. And it is more than likely that the ceaseless activity of his wise and Celtic mother taught Cyrus the value of each moment of time.

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Ever since he was a child of seven it was his father's ambition to invent a reaper. He made one, and tried it in the harvest of 1816, but it proved a failure. It was a fantastic machine, pushed from behind by two horses. It was highly ingenious, but it would not cut the corn, and was hauled off the field to become one of the jokes of the countryside. Hurt by the jests of his neighbours, he locked the door of his workshop and toiled away at night. Early in the summer of 1831 he had so improved his reaper that he gave it another trial. Again it failed. True, the machine cut the corn fairly well, but it flung it on the ground in a tangled heap. Satisfied that there was something radically wrong, Robert McCormick gave up the reaper after having worked at it for over fifteen years.

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At this point Cyrus took up the task which his father had reluctantly abandoned. He showed his genius from the very start by adopting a new principle of operation. First of all, he invented the divider to separate the corn to be cut from the corn left standing. Next came the reciprocating blade, and the fingers, the revolving reel, platform, and side draught, and, lastly, the big driving wheel. One day late in the month of July, in the summer of 1831, Cyrus put a horse between the shafts of his reaper. With no spectators save his father and mother, his brothers and sisters, he drove down to a patch of yellow grain. To that little family circle it must have been a moment of intense excitement. Click, click, click—the white blade shot to and fro. What a shout of joy! The wheat is cut and falls upon the platform in a golden, shimmering swathe!

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Thus at the early age of twenty-two Cyrus had invented the first practical reaper that the world had seen. And now began his nine years' struggle with adversity, from which he emerged in triumph to become the greatest manufacturer of harvesting machines that America has produced. In order to obtain funds with which to manufacture reapers he started to farm. But he soon found that it was impossible to raise sufficient capital by this means. Near by was a large deposit of iron ore, and he forthwith resolved to build a furnace and make iron. He persuaded his father and the school teacher to become his partners. For several years the furnace did fairly well, when, suddenly, the price of iron fell. The McCormicks were bankrupt. Cyrus gave up the farm, and stuck grimly to his reaper. One day the village constable rode up to the farm door with a summons for a debt of nine-teen dollars, but he was so impressed with the industry of the McCormicks that he had not the heart to serve the notice. It was the darkest hour before the dawn.

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The same year (1840) a stranger rode in from the north and drew rein in front of the little log workshop. He was a rough looking man with the homely name of Abraham Smith, but to Cyrus he came as an angel of light. He had come with fifty dollars in his pocket to buy a reaper—the first that was ever sold. A short time later two other farmers came on the same errand, and that summer three reaping machines were working in the wheat-fields of America. In 1842 McCormick sold seven machines, and in 1844 fifty. The home farm had now become a busy factory.

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Three years later a friend said to him "Cyrus, why don't you go West with your reaper, where the land is level and labour cheap?"

It was the call of the West.

He travelled over the boundless prairies, and was quick to see that this great land-ocean was the natural home of the reaper. Straightway he transferred his factory to Chicago—then, in 1847, a forlorn little town of less than 10,000 souls. His business flourished. In the great fire of 1871

his factory, which was then turning out 10,000 harvesters a year, was totally destroyed. At the word of his wife he rebuilt it anew with amazing rapidity. And so we find that the tiny workshop in the backwoods of Virginia has become the McCormick City in the heart of Chicago. In the sixty-five years of its life this manufactory has produced over 6,000,000 harvesting machines, and is now pouring them out at the rate of over 7,000 per week. The McCormick Company is now known as the International Harvester Company, and his eldest son, Cyrus H. McCormick, is the President. The annual output is 75,000,000 dollars. It was the reaper that enabled the United States, during the four years of the civil war, not only to feed the armies in the field, but at the same time to export to foreign countries 200,000,000 bushels of wheat. And well might the savants of the French Academy of Science say, when electing Cyrus McCormick a member, that "he had done more for the cause of agriculture than any other living man."

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And now we must trace the evolution of the reaper from its origin on the Walnut Grove Farm to the marvellous machine of to-day. For about thirty years it remained practically unaltered in design, save that seats had been added for the raker and the driver. It did no more than cut the grain and leave it in loose bundles on the ground. It had abolished the sickler and cradler, but there still remained the raker and binder. Might it not be possible to do away with them also, and leave only the driver? Such was the fascinating problem which now confronted the inventor.

In the year 1852 a bedridden cripple called Jearum Atkins bought a McCormick reaper, and had it placed outside his window. To while away the weary hours he actually devised an attachment with two revolving iron arms, which automatically raked off the cut grain from the platform to the ground. It was a grotesque contrivance, and was nicknamed by the farmers the "iron man." Nevertheless, this invention stimulated the manufacture of self-rake reapers, and soon the American farmer would buy no other kind. Thus part of the problem had been solved. The raker was abolished. But there still remained the harder task of supplanting the binder—the man or the woman who gathered up the bundles of cut corn and bound them tightly together with a wisp of straw into the sheaf.

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And now another figure appears upon this ever-moving stage, a young man by the name of Charles B. Withington. Born at Akron, Ohio, a year before McCormick invented his reaper, this delicate youth was trained by his father to be a watchmaker. At the age of fifteen, in order to earn pocket-money, he went into the harvest field to bind corn. He was not robust, and the hard, stooping labour under a hot sun would sometimes bring the blood to his head in a hemorrhage. There were times after the day's work was done when he was too weary to walk home, and he would throw himself on the stubble to rest. At eighteen he journeyed to the goldfields of California, drifted to Australia, and in the year 1855 arrived back in Wisconsin with 3,000 dollars in his belt. All this money he began to fritter away in trying to invent a self-rake reaper. Suddenly, inspired by the articles of a rural editor, who maintained that the binding of corn should be done by a machine, Withington dropped his self-rake and went straight to work to make a self-binder. He completed his first machine in 1872, but met with much discouragement until, two years later, he came across McCormick.

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Their dramatic meeting is best told by Mr. Herbert M. Casson in his interesting volume, entitled "Cyrus Hall McCormick: His Life and Work."

"One evening in 1874 a tall man; with a box under his arm, walked diffidently up the steps of the McCormick home in Chicago, and rang the bell. He asked to see Mr. McCormick, and was shown into the parlour, where he found Mr. McCormick, sitting, as usual, in a large and comfortable chair.

"My name is Withington,' said the stranger; I live in Janesville, Wisconsin. I have here a model of a machine that will automatically bind grain.'

"Now, it so happened that McCormick had been kept awake nearly the whole of the previous night by a stubborn business problem. He could scarcely hold his eyelids apart. And when Withington was in the midst of his explanation, with the intentness of a born inventor, Mr. McCormick fell fast asleep. At such a reception to his cherished machine Withington lost heart. He was a gentle, sensitive man easily rebuffed, and so, when McCormick aroused from his nap, Withington had departed, and was on his way back to Wisconsin. For a few seconds McCormick was uncertain as to whether his visitor had been a reality or a dream. Then he awoke with a start into instant action. A great opportunity had come to him, and he had let it slip. He was at this time making self-rake reapers and Marsh harvesters; but what he wanted—what every reaper manufacturer wanted in 1871—was a self-binder. He at once called one of his trusted workmen.

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"I want you to go to Janesville,' he said. Find a man named Withington and bring him to me by the first train that comes back to Chicago.'

"The next day Withington was brought back, and treated with the utmost courtesy. McCormick studied his invention, and found it to be a most remarkable mechanism. Two steel arms caught each bundle of grain, whirled a wire tightly around it, fastened the two ends together with a twist, cut it loose, and tossed it to the ground. This self-binder was perfect in all its details—as neat and effective a machine as could be imagined. McCormick was delighted. At last, here was a machine that would abolish the binding of grain by hand."

For six years all went well with the McCormick and Withington self-binder. This wonderful wire-twisting machine was working everywhere with clockwork precision, and was believed to be the best that human ingenuity could devise. All at once the manufacturing world was startled with the news that William Deering had made and sold three thousand twine self-binders. Deering, by this dramatic move became in a flash McCormick's most powerful competitor. He was not a farmer's son, like the latter, being bred in the city and trained in a factory. He had been a successful merchant at Maine, then left it to enter the harvester trade. He staked his whole fortune on making twine binders. He won, and McCormick was forced to follow in his wake. The evolution of the reaper into the twine self-binder was an epoch-making event in the agricultural world. It enormously increased the sales. In 1880, 60,000 reapers were sold; five years later the figures had risen to 250,000. Since then, with the exception of the new knot-tying device, there has been no real change in the reaper. It remains the grandest of all agricultural machines, and one of the most astonishing mechanisms ever devised by the brain of man.

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McCormick died in 1884. In the span of his own life the reaper was born and brought to perfection. He created it in a remote Virginian village, and he lived to see his catalogue printed in twenty languages, and to know that so long as the human race continues to eat bread the sun will never set on the Empire of his reaper, for somewhere, in every month in all the year, you will find the corn white unto the harvest.

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Transcriber's Notes

The birth year for Thomas William Coke is reported on Page 17 as 1752; page 36 states "Coke died in 1842 at the age of eighty-eight"; and Wikipedia reports Coke was born on 6 May 1754 and died 30 June 1842 (aged 88). So, the year of Coke's birth on page 17 should probably be 1754. Wikipedia shows that a gravestone has been placed on Mr. Tull's resting place.

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