

THE BUSINESS
OF FARMING

WM. C. SMITH

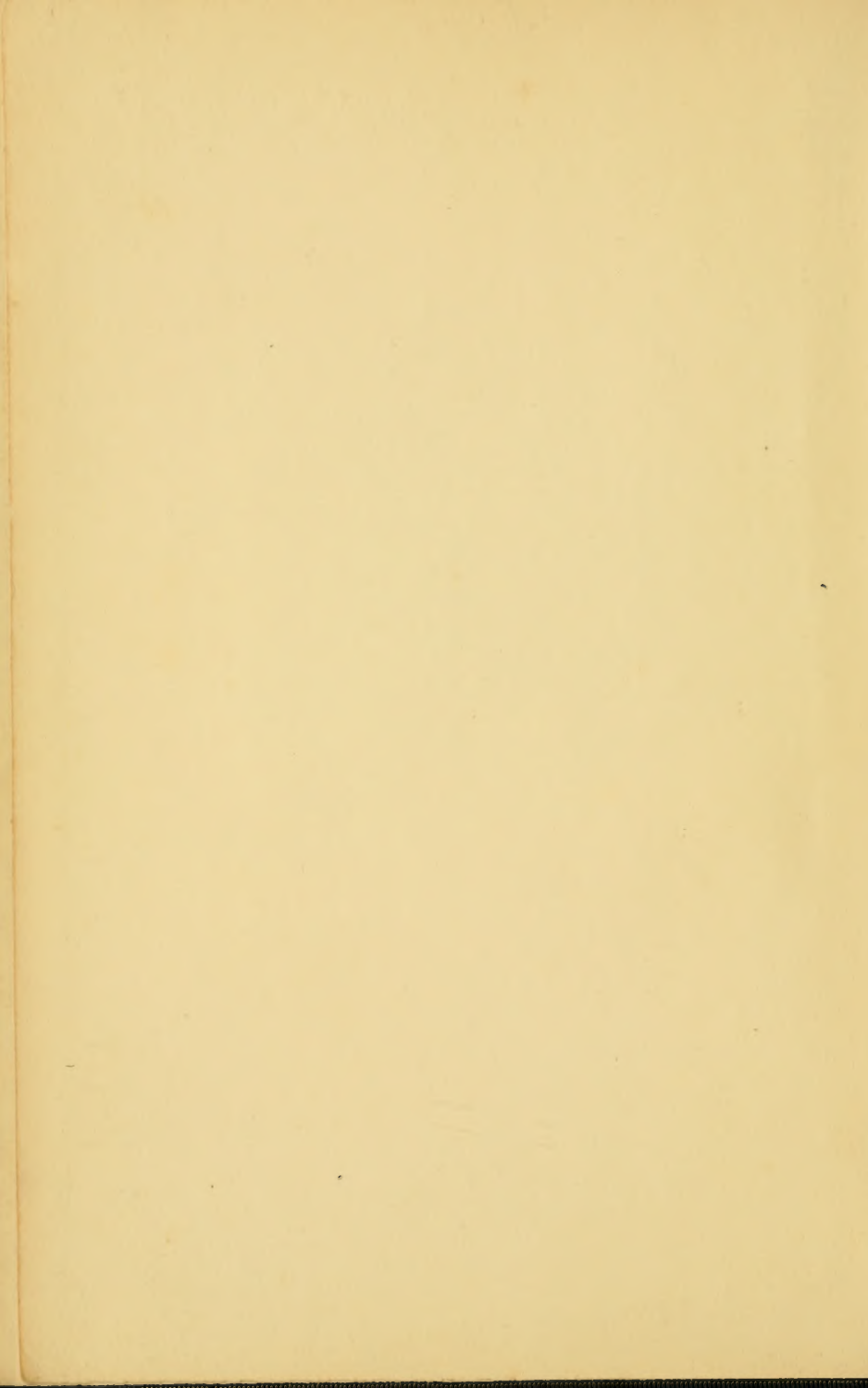


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How to Grow 100 Bushels of Corn Per Acre on Worn Soil

By WILLIAM C. SMITH

Author of
The Business of Farming

Pronounced, the world over, by men who know, to be the most common-sense, practical and interesting farm book ever written in any age of agricultural history.

Thousands have said that it should be in the hands of every one interested in the soil.

And some have even said that it is worth more to the cause of agriculture than any book upon the subject that has ever been written, unless it be Mr. Smith's new book upon The Business of Farming.

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CINCINNATI



"THE FARMER OF TO-MORROW."

The Brightest Prospect for the Business of Farming.
"And a little child shall lead them."

THE BUSINESS OF FARMING

BY
WILLIAM C. SMITH
OF INDIANA

Author of "How to Grow 100 Bushels of
Corn Per Acre on Worn Soils" and
"The Book of Vetch."

TIMES are propitious for agricultural books written simply and understandingly, free from the technicality the average layman does not understand. . . .

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No. 1.

DEDICATORY

To the earnest company of thoughtful humanity-loving men and women who are working with might and main to bring about better methods of farming and farm living, by which the fertility of our soils may be increased and maintained, and that our farms may have better homes and home surroundings, this volume is dedicated.

SOME REFLECTIONS

BUSINESS is nothing more than being industriously engaged in the affairs of some occupation from which we derive our support.

FARMING is our biggest business. It feeds the nations of the world and is the basis of all prosperity and happiness, and therefore should receive our biggest consideration, and be safeguarded by our best brains and legislation.

IN pioneer days when farming implements and machinery were of the crudest kind, requiring muscle to use them, brawn, more than brains, was needed in the business of farming, in order to rescue soils from the wilderness of timber and prairie growth.

IN these days of worn and worn-out soils and the abandoned farm, with the most improved labor-saving farm machinery, the business of farming needs brains more than brawn, that our soils may be rescued from the wilderness of wasted fertility that has stifled them.

ALTHOUGH the business of farming requires in its operations constant industry and the exercise of thought and study in its every detail, in order to make it successful, yet it affords greater opportunities for the best and right living, and the achievement of happiness, than any other business.

A JUSTIFICATION

Some Biblical writer said that of the making of books there is no end. We wonder what he would say if he lived in this age and saw the publication of books, in number almost as the sands of the sea.

In the face of this book multiplicity we can offer no excuse for the publication of this volume further than the fact that the importance of the subject treated at this time so bears upon the happiness and prosperity of our people and nation, that it becomes an impelling motive for its publication.

We do not make the claim that for this volume we have even written a truth not yet uttered, but believe we have placed an emphasis upon many truths pertaining to the business of farming that has not been previously placed, which, according to Drummond, is ample justification for perpetrating another book upon a long suffering public.

In this volume we have simply recorded the knowledge gathered from long experience, careful observation, and intense study of the subjects treated, and we have attempted to state this knowledge thus gathered in a simple, untechnical way, so that any one can read, be interested, entertained and profited thereby.

Bacon said, "Some books are to be tasted; others swallowed; and some few to be chewed and digested." We are hoping that this shall prove

to be one of the books that shall be "chewed and digested," for the subject treated is the very foundation of the fabric of our society, as the stability and progress of our every institution and business depends upon the prosperity of the business of farming.

When God, in the beginning of the world, made farming the first business, He gave it a setting not given to any other business. He gave as its foundation a soil full of the mystery of plant and microscopical life, where His wonders are revealed to a greater extent than in the incomprehensible magnitude of the region of the stars. And there springs from this soil the plant and tree growth producing the myriads of products of varied hue that delight the senses and sustain the life of man.

All manner of animal and bird life is about to contribute to the farmer's enjoyment and use in a thousand ways.

The seasons were created and set in perpetual motion that seed time and harvest might come at certain appointed times. The clouds, the rain and sunshine come also in their appointed place, assuring us of God's promise that seed time and harvest shall never fail.

Over and about the business of farming God has set the open sky so wonderfully mystifying to the mind, and delightful to the eye, and the birds of beautiful and somber plumage, so full of song, that cheer and delight the soul. Spring with its awakened life, Summer with its growth in full swing, Autumn with its maturity and incomparable coloring, and Winter with its sleeping life

and mantle of snow, are exemplified in all their glory and mystery to those who engage in the business of farming.

Therefore, if the author has presented something in this volume that will cause some of those who are engaged in the business of farming to feel so keenly the character and importance of their business that they will put forth the greater effort to make it measure up to its intended standard, he will feel rewarded for his efforts, and justified in publishing this volume.

WILLIAM C. SMITH.

Delphi, Indiana, January, 1914.

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THE BUSINESS OF FARMING



A BRAVNY PIONEER OF THE TIMBER BELT.

He belonged to the "Farm Age of Brawn" which was succeeded
by the age of Improved Farm Machinery.

When the hill of toil was steepest,
When the forest-frown was deepest,
 Poor, but young, you hastened here;
Came where solid hope was cheapest—
 Came—a pioneer.
Made the western jungles view
 Civilization's charms;
Snatched a home for yours and you,
 From the lean tree-arms.
Toil had never cause to doubt you—
 Progress' path you helped to clear;
But To-day forgets about you,
And the world rides on without you—
 Sleep, old pioneer!

—WILL CARLETON.

THE BUSINESS OF FARMING

CHAPTER I

HISTORICAL RÉSUMÉ OF THE BUSINESS OF FARMING

FARMING is our biggest business. It is the great heart of the business system that pumps the rich red blood of commercial activity through the veins and arteries of the world's business. Soil is the chief item of raw material from which the finished products of this business is made.

The 1912 finished products of the business of farming, wrought from the raw material of the soil, amounted to the staggering sum of ten billion of dollars. And yet this vast wealth was produced by a business the most poorly organized and conducted, the least conserved, and the most neglected of any existing business of this age.

At a cost of fabulous sums, methods have been developed and consummated for perfected machinery, better distribution, and business systems by which every other business on earth may be successfully operated.

Without such methods and systems not a single modern business could have reached its present magnitude or greatness.

We are living in the world's greatest commercial age. The iron rails of the roads of commerce stretch out, encircle, and twine about the globe like threads of twine.

Titanic ships like as a multitude plow the waters of the oceans and seas, carrying the people and commerce of nations.

Cities, numberless as the sands of the sea, have sprung up in a span of years, mightier in girth and magnitude than any of the real or fabled cities of antiquity or of any ever dreamed or imagined.

Our nation is cutting a mighty canal through a continent, deep and wide enough for the sailing of the largest ship of commerce, and is turning the failures of a generation ago into success.

Mills and factories of staggering dimensions whose chimneys belch out clouds of smoke that shut out from the world the light of the King of Day, are building and turning out for man's use and enjoyment, those wonderful mechanisms and inventions of the modern master minds that out-class the seven ancient wonders of the world.

Almost instantly we communicate with and talk to our friends, leagues away, through the telegraph, wireless and telephone.

The very intonation of our voices is recorded upon the phonographic scrolls, to be preserved that we may converse in our own characteristic tones for ages after our bodies shall have been mingled with the dust of the earth.

Machines record for all time the every movement of the dramas and events of life in living reality, to be reproduced at will upon canvas,

not only for our own delight, but for the delight of generations yet unborn. And yet all these wonders are but the monuments of agriculture that were made possible only through the business of farming, or the business of the tilling of the soil, and emphasize the startling fact that a partial crop failure would result in distress, a total failure in disaster.

When the world was created farming became its first business. After God had said "let there be light" and there was light, He divided the waters, the dry land appeared, and under His command it brought forth grass, the herb yielding seed, and the tree yielding fruit. He created man, planted a garden and put him into it to "dress it and to keep it." Satan came and tempted man. He fell, and his punishment was banishment from the garden into the pathless wastes of the wilderness, burdened with the awful sentence, "Cursed is the ground for thy sake. In sorrow shalt thou eat of it all the days of thy life, and thou shalt eat the herb of the field."

Thus in the very dawn of creation the tilling of the soil became the source of man's bread, and his first business, and so continued until the world became so wicked that God deluged all mankind with His waters, and none but Noah and those in his ark survived.

When the waters receded and the dry land appeared and Noah left his ark, he built an altar and offered a sacrifice acceptable unto the Lord. And the Lord said, "I will not again curse the ground any more for man's sake." And Noah, after he had offered his sacrifice, began to be an

husbandman, and again the business of farming became the first business of the only men then upon the earth, and has since so continued through all the ages of man's existence, and to-day, at the period of man's greatest development and power, he still must "eat of the ground" or perish. There is no other source for an adequate supply of food, so the business of farming, or tilling of the soil, was not only the first business to be established, but is even unto this day the first and most important business of any nation, and upon which every other business must build for a foundation. It is therefore inconceivable that a business almost as old as time itself, so fundamental to man's existence, a business whose breasts have given the nourishment and power and the life to make every other business or achievement possible, should have through all the ages of the world's history received at the hands of man the mistreatment and neglect that the business of farming has received from the hand of him whom it has fed. But it seems that the history of the world has been but the history of conquest and despoliation. Nations and peoples have conquered nations and peoples and despoiled them, and so has man in all his history conquered the soil from the wilderness, only to despoil it by a sordid system of agriculture. If the business of farming could talk, well might it exclaim: "Rescue my poor remains from vile neglect!"

This is not a picture or wail of the pessimist, for do we not hear even to-day the cry of a John the Baptist crying in the wilderness of soil desola-

tion and soil destruction to flee from the wrath of worn and worn-out soils?

His cry was even heard in ages past. It fell on ears deadened with greed and avarice and stolid indifference, and the wrath of worn and worn-out soils came as a pestilence and swallowed up nations once proud and great.

When the gentle and loving Savior of mankind and his disciples walked through the fertile fields of Palestine plucking the ears of corn for their food, he was on the mission of talking and teaching the gospel of life and help and love to the multitudes that came from the fruitful valleys and hillsides of the fertile Holy Land that contained many cities of commerce and power; but now these cities lie covered with the débris of centuries, the fertile valleys and hillsides that sang to the Christ the song of plenty, lie stripped of their fertility by a system of soil neglect that mined them of their soil wealth and they have become "a dreary desert and a gloomy waste."

Romeward the student of history delights to set his face, for the study of its history is so fascinating. So, delving into the history of Rome, he finds that agriculture was once its biggest business. She acquired the greatest agricultural literature ever possessed by any nation, and under its inspiration her agriculture so flourished that she grew in wealth and power and reached the pinnacle of her greatness. But she forgot the source of her power. Her agricultural operations were intrusted to slaves or bondsmen driven under the lash without wages, so her soil was neglected and her fields became stricken with

sterility. In vain her Calumella sounded the warning and pointed out the way for the soil's restoration, but his warning and advice were spurned, "the produce of the land was only four-fold," the soil suffered from greater neglect, remunerative crops were no longer harvested, and the nation went into decay. It is no wonder then that Rome's greatest poet became imbued with the hopeless creed of the fatalist when singing of the degeneracy of agriculture, and exclaimed:

"'Tis thus by destiny, all things decay
And retrograde, with motion unperceived."

The wise statesman Joseph gathered and garnered corn as the sand of the sea from the fertile valleys of the Nile, and so have generations since, yet these lands would have ages ago felt the blight of neglect had not old Nature sent down each year from the headwaters of the Nile the silt-laden floods to engulf, renew, and enrich them.

China, standing forth in the list of agricultural countries, whose philosophy likens prosperity to a tree with agriculture as its roots, and industry and commerce as its branches and leaves, if the roots suffer the tree dies, has a vast area of abandoned farms once fertile and productive, the reclamation of which has been called the "Problem of China." But even China is making a tremendous effort to maintain the fertility of most of her lands in cultivation, but she has done it by using a mixture of human excrement with fat marl, and by carefully saving every substance

that can be converted into manure. Horns, hoofs, bones, soot, ashes, old plaster, hair, barbers' shavings, contents of sewers, vegetable refuse, human and animal urine being among the substances carefully garnered and used for maintaining soil fertility.

Even thousands of her women haunt the streets, alleys, lanes and loafing places of men, and with baskets make it a business of gathering human excrement, to be used for soil enrichment. Do we want the future generations of the women of America to sink to the level of gathering human excrement as a last resort that our soils may be stimulated so that they will produce the "foodful ear" that our hungry hoards be fed? Yet the consummation of this very thing is no "idle dream"; it will become a living reality if our soil waste be not stayed, and unless sane conservation of soil fertility becomes a part of our agricultural economy, and unless the business of farming be conducted as our great manufacturing and mercantile establishments are conducted and managed.

The poverty-famine-stricken-fatalistic-death-longing inhabitants of India have become so through the environment of exhausted, worn-out soil that yields such a scant pittance that these people long for death, believing that somewhere beyond this pale of existence there is a land where they will be better fed. And yet, this famine, poverty-cursed land of mystery, with its fifty rivers winding their way to the ocean through unequaled valleys of once fertile soils, was at one time peopled with a race out of the

common order, who wrote the most remarkable sacred literature that the world has ever known. Four hundred and fifty thousand square miles in Hindustan, an empire in itself, capable of supporting a mighty people, lie a waste untouched by plow or hoe,—“A waste too bleak to rear the common growth of earth, the foodful ear,” yet an area of soil said to be capable of yielding rich harvests. In cultivated lands of India one crop follows another in quick rotation, and only such crops are grown in this rotation which furnish food for man and beast, which crops always feed upon and consume the fertility of the soil. Those crops which produce the smallest amount of food for man and beast, yet feed the soil with the elements it needs to make it fertile, are unknown to these people. No means to enrich or build up the soil are used—not even manure, for fuel is so scarce that the dung of animals is dried and used for fuel. India’s soil was once full of virgin richness. It has become barren through cruel neglect. Her fields have become worn-out soils.

England, Germany, and a few other powerful nations of the old continent, a century or more ago, were confronted with the menace of worn and worn-out soils. But these nations rose to the occasion and realized that their soils must be compensated in some manner; that this compensation even meant to follow the spurned advice of the wise Roman agricultural writers given centuries ago to the Roman farmer, which was: First; to plow well. Second: to plow again. Third: to manure. Fourth: to compensate the land by planting legumes and using them for

green manuring. When these nations began to act along the lines of this splendid advice, their soils began to appreciate their good treatment, and poured into the laps of their husbandmen their increased and paying crop yields, and the truth was exemplified that even poor, dumb soils can show their appreciation of good treatment and compensation.

Every living nation of the old continent to-day which ranks lowest in the scale of nations, whose people are steeped in ignorance and are wasted and diseased with famine, is a nation which possesses in abundance worn-out soils, or soils which no longer produce paying crops.

You may trace the progress of agriculture from the time that God made it the first business when He planted a garden and put Adam into it to "dress it and to keep it," to the time when America was first settled, and you will find that generally agriculture has been carried on under that system that has led to the soil's neglect.

When the tide of immigration flowed toward the shores of newly discovered America, this continent of ours became peopled with men who brought with them this same spirit of soil neglect that had been their inheritance. The early colonists of Canada, New York, Pennsylvania, Virginia, Maryland, etc., found the land rich in the elements of fertility that Nature gave it. By a continual system of plowing, sowing, and reaping, it yielded for years bountiful crops of cereals, vegetables and tobacco, and when by this process the soil was strangled with its wasted fertility and the farms were despoiled, their

owners with marble hearted ingratitude abandoned the land that fed them and sought new soils to conquer and despoil, for they said in their hearts, America had of lands a plenty.

Unspairingly did Clayton and Beverly of Virginia, and Eliot of New England, denounce the methods of husbandry in vogue among the colonists, methods by which tobacco was continuously grown on the same land without the application of any fertilizing material, until the soil, exhausted of fertility, would no longer grow any crop and then was abandoned.

Those colonial farmers for years scratched the surface of the soil with instruments which they deluded themselves into believing were plows, and so became imbued with the erroneous idea that deep plowing ruined the land, which idea seems to have been inherited by many of the farmers even of this generation.

The agricultural economy of conserving soil fertility was never practiced by these people, but a system of soil pillage and neglect was so practiced by them that vast tracts of lands through every part and portion of our eastern states, originally abounding with a plethora of fertility, in less than two generations were exhausted of their soil wealth and became deserts too bleak to rear the foodful plants that feed mankind. These lands thus robbed and plundered along the Jerusalem and Jericho road of agriculture by the soil robber, the highwayman of agriculture, lie bleeding and sore, awaiting the kindly ministrations of agriculture's good Samaritan, the Soil Doctor. In

the meantime Nature is applying to the stricken victim the simple slow process of restoration.

The hosts of soil conquerors and soil despoilers have since colonial days been marching through our land. For after the American farmer had mined out the soil wealth of the New England states by sordid tillage, he moved westward, preëmpted more rich virgin soils and mined out their wealth by the same damnable tillage. Not content with the waste he had wrought on the soils he had already pillaged, he moved on into the rich forest covered soils of Indiana and Kentucky, and the prairie soils of Illinois, and laid his devastating hands upon these soils and also pillaged them of their fertility. And yet not content with the waste he had wrought, he crossed the "Father of Waters," carrying with him the same system of sordid tillage and devastated the prairie plains of Iowa, Missouri, Nebraska and Kansas, upon which Nature had for centuries garnered and stored fertility which, if it had been carefully conserved, would have poured out its wealth in crops for ages.

He moved on to the Dakotas, conquered the prairie sod, worked it up into the rich seed bed that grew crops of wheat and flax for a generation that made him rich. But finally Nature re-sented the infamy of one continuous crop growing for years upon her soils, and began to withdraw her bounty, and now that vast area of wheat and flax lands does not produce paying crops of these grains for the small land owner. It is only the large land owner with his thousand of acres

with its small profit to the acre, who can successfully farm those lands.

Again he raised his eyes and looked still westward and sought more soils to conquer and to pillage. He sighted the rich valleys of the Golden State and swept down upon them, and subjected these acres to the scourge of a continuous one crop growing of wheat until the soil refused longer to give up its increase, so he pushed on and on until the mighty Pacific stayed his course.

This conquering and pillaging of the fertile soils of the Mississippi and Missouri valleys and the plains of the West occurred chiefly during the period of years from 1870 to 1895 when most of these soils were subdued to cultivation. The larger portion of these lands were bare of timber, so were ready for the plow. It was a period when improved farm machinery came into use which resulted in extensive rather than intensive farming.

The virgin richness of these soils for years poured out their crop wealth to the farmer, and while difficulties of transportation were encountered, yet the markets were congested with farm products and vast quantities found their way to the old country, and other nations were fed from our farm products.

The great cities and great manufacturing plants were built and the progress of our country was wonderful, but as the fertility of these lands was being slowly mined out, though crop production increased, there was no money in farming, farmers became land poor, and the

movement of both men and boys from the farm began. Land depreciated as well as fertility of the soil, and our soil's crisis became a part of our agricultural economy. Our farmers were in a helpless condition; many could not live and pay the interest upon their indebtedness, and foreclosure and loss of their land resulted. But the people of the world continued to eat, so about the year 1895, when our lands had practically been all subdued, and consumption had caught up with and outstripped production, farm products and farm values began to advance, which led to still more extensive and less intensive farming. The growing of certain grains became profitable, so farmers confined themselves to one crop. All these forces led to a further lessening of crop fertility.

For a long period farming has been a paying business and the farmer has driven his farm to its limit of production, and its soil in consequence has been sorely neglected, and the soil robber has become more bold in his nefarious occupation of robbing the soil of its wealth.

The reader, no doubt, is impressed that the writer's indictment against the American farmer is too severe and his condemnation too strong, and that after all, agriculturally, soil conditions in our land are not so bad. To the casual observer this may seem true. He reads the Department of Agriculture Reports of 1912 bumper crops, and concludes that with our nation, agriculturally, all is well. And yet if we compare the 1912 crops with the general ten-year average, we find a difference of but a small per cent., and dur-

ing the past ten years have not all our crops been consumed? And yet many of our people have not had a full dinner pail or a loaf of bread upon their dining table, and have gone to bed night after night suffering the pangs of hunger.

Have we not had for years a mighty agitation as to the "high cost of living"? An agitation no doubt solely responsible for the conception and birth of a new and powerful political party, and for a mighty political party with a proud history to go down in humiliating defeat, if not to its death. Yet after all, has not the "high cost of living" been brought about by the high appreciation of the products of the soil?

Our nation is growing at a tremendous rate. A million of foreigners a year are coming to its shores, mingling with its people, and yet, but little of its soil capable of being cultivated is unreclaimed. We have a hundred million of people to feed and less than one-half of them are producers of food. If, then, for the past ten years we have produced crops showing a general average nearly equal to the average of this, our most prosperous year agriculturally, and those crops have been consumed at high prices, which always is indicative of short supplies, how can we continue to feed our people enough, and yet feed the people coming to our land like as a multitude?

But, really, is our soil condition so serious? Are we facing a soil exhaustion crisis? Has the business of farming been so neglected? To answer these questions we have but to point to the fact that in the past ten years our population has

increased 21 per cent., the acreage of our farm lands 4.8 per cent. In other words, the number of mouths to feed has increased nearly five times as rapidly as the source of our food supply, and the country has been producing less per acre than it produced ten years ago.

We point to the abandoned farms of the East, to the "Volusia soils" stretching from the Hudson River westward across Pennsylvania into the Ohio, an area of ten million acres, once fertile soils occupied by fine old homes and barns, now seemingly unfit for cultivation, and to the exhausted cotton and tobacco lands of the South.

Look at the reputed rich corn lands of Ohio, Indiana, Illinois and Iowa, upon which less than fifty years ago the writer has seen "King Corn" lift his proud head twelve to fifteen feet in the air, waving and rustling his rich green heavy foliage with every passing wind, bearing his heavy golden ears beyond man's reach, that measured to the husbandman eighty and one hundred bushels to the acre, where now he sees him with dwarfed and diseased body bearing his shriveled, chaffy ears so near the ground that it becomes a burden to gather them, ears that measure less than a score of bushels to the acre.

And this latter condition is not a limited one by any means. You see it on thousands of acres, and it applies to the growing of all crops. Crop yields on these lands are growing smaller each year; the area of worn soils grows larger and larger; it is our nation's most vital disease which has insidiously fastened itself upon our soils, and like a cancer existing in the human body, "with-

out marked symptoms, not appearing so bad as it really is, yet becomes active upon some slight occasion," and plunges its victim into excruciating suffering and lingering death.

R. G. Dunn & Co. say that "true national prosperity springs from the soil," but it will never spring from a soil so diseased that it produces crops of a stunted growth.

We have shown how a people living on a weak, worn soil, are listless and without ambition. Their soil yielding barely enough to furnish food to sustain their lives, they have nothing left with which to buy any of the comforts of life, or to employ the means by which their soils can be made to produce paying crops. Their energy is sapped up by this discouraging environment. This very condition exists to-day to an alarming extent among the people in the "Highlands" or mountain districts of the South. These people are the descendants of the signers of the Declaration of Independence, and heroes of the Revolutionary War, and the blue blood of the best citizens of colonial days courses through their veins. They would be a proud, prosperous and useful people were they but possessed of fertile soils, but as it is, their spirit is broken, their pride is gone, they are victims of a soil that has withdrawn from them its bounty, because it has become worn and unproductive.

These same conditions are obtaining in every portion of our country, even in the rich corn-belt district. The writer sees it every day. Farms once rich and fertile which have in the past made their owners rich, but which now, after experi-

encing forty or fifty years of a mining process by which the main elements of soil fertility have been mined out of them, are now in the possession of men and their families that possess the same broken, discouraged spirit as the "Highlanders" of the South who do not seem to be able to lift themselves above their environment and change the condition of their soil.

And as our soils continue to grow poorer and poorer this condition of our people will become more acute and spread like an infectious disease.

But what has caused or brought about this alarming condition? Greed, environment and preaching of false agricultural doctrines. The farmer of the past found the soil rich in all the elements that make a fertile soil. He scorned the study of scientific agriculture. His policy was to haul to the barn everything that grew upon his soil. With match he burned the fertilizing by-products of his farm. He forgot that soil is a "living, breathing thing," and like his beasts must be fed and groomed. His main thought was the dollars that could be produced from his farm products. Is it any wonder then that his soil was strangled with its wasted fertility?

We have shown how the pioneer found our rich soils, rescued them from the wilderness and subjected them to the growing of crops for gain. These soils were rich in every element necessary to a fertile soil which would produce a hundred-fold for a generation or more, and so these pioneer farmers did not see the need of soil conservation. They became imbued with the false notion that their soils would never wear out. Under this

condition of false security the pioneer farmer did not teach his children the principles of soil conservation, and these children grew up impregnated with the same false notions, transmitted them to their children, and thus an environment has been thrown around the pioneer farmer, his children and children's children, an environment that has held scientific agriculture and book farming in contempt, and which has led to methods that have mined our soil wealth and which is responsible for much of our worn soil.

Again the voice of the False Teacher has been heard upon our farms, and we have listened to the promulgation of the false doctrine that crop rotation alone, and like doctrines, would maintain the fertility of our soils.

Even our Government through its great agricultural department that has done so much to make the business of farming flourish, has promulgated the infamous doctrine that our soil is in no real danger of exhaustion and that soil will not wear out, and yet almost within a bird's eye view from the dome of our splendid capitol at Washington, thousands of acres of agricultural lands lie abandoned, which less than one hundred years ago were occupied by a hospitable, chivalric people living in the stately southern homes and mansions surrounded by fertile fields abounding with a plethora of farm produce. Why have these once splendid fields become a desolation, a dreary waste? Because their soils lost their power to produce paying crops, and so became worn out. Scientifically speaking, these soils were not destroyed, they still contain plant food

elements, but nevertheless they are so worn out that they no longer produce the crops that pay for the labor required to grow them, although they were farmed with proper tillage and under proper rotation of crops.

Lexicographers define the word exhaust as to drain, to use or expend wholly or until the supply comes to an end; to deprive wholly of strength, to use up, to wear or tire out, to wear out. If, then, these soils were abandoned because their owners could no longer grow upon them sufficient crops to support them, was not their fertility exhausted? To us laymen of agriculture, it certainly seems that they were exhausted and that our great Agricultural Department has promulgated a vicious doctrine, the teaching of which, if followed by the farmers of America, will lead every acre of our agriculture lands towards and into the doom of the abandoned farm.

Thus the Nation's worn and worn-out soils, our stern inheritance, become its most vital disease, and our greatest business is threatened with serious injury.

We must realize that this is the most serious problem confronting the husbandman to-day, and unless we realize this menace to our nation's prosperity and combat it, this nation of ours will perish from the face of the earth as surely as many of the dead nations of history perished from the same cause.

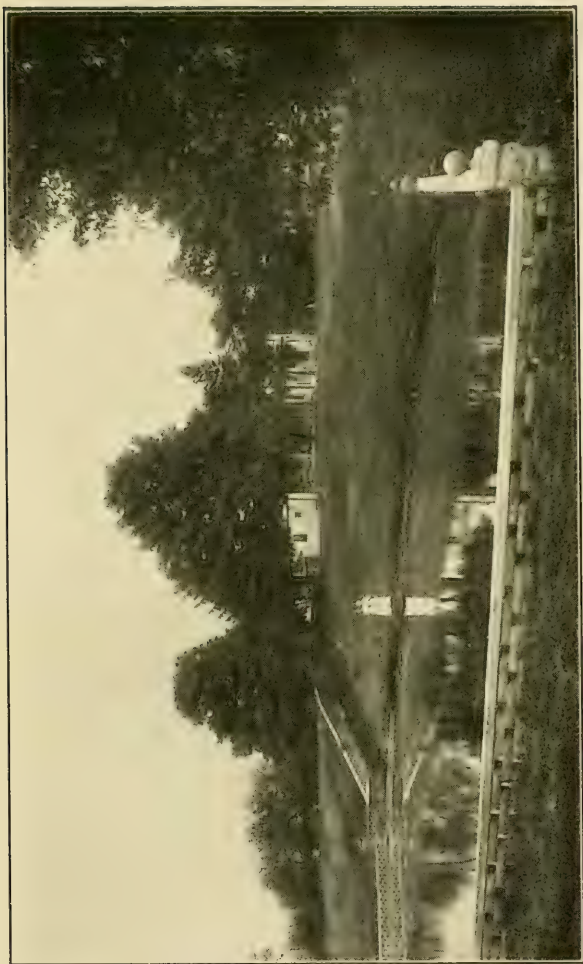
CHAPTER II

THE DISCOURAGEMENTS AND VICISSITUDES OF THE BUSINESS OF FARMING

EVERY human being is susceptible to the influences of discouragement. Many possess the happy faculty of presenting to the world a front that shows no evidence of its blighting effects, and surely thrice happy is he who can meet the discouragements of life with that human courage we call grand and sublime.

We who are susceptible to the influences of discouragement, would gain much courage and help if we would but remember that even the Christ, when on earth, came under the crushing power of discouragement, for, when he learned that one of his disciples had bargained to betray him for thirty pieces of silver, and that another had purposed in his heart to deny him, he came to Gethsemane with a heart and body broken and bowed down with exceeding sorrow and discouragement, fell upon his face, and prayed for the passing of the cup. Yet, in that hour of quiet prayer within the stillness of Gethsemane, he gained the courage that bore him through the greater trial of the Cross, Calvary and death.

There is not a business but has its periods of discouragements, its drawbacks, its vicissitudes. Panics come, sweep away the fortunes of business



THE SIMPLE FARM HOME AMID PLEASANT SURROUNDINGS.

The water in the reservoir is furnished by a flowing well which also operates a hydraulic ram that forces water into the residence and barn for domestic and stock uses.

men, and leave them stranded with naught but hope remaining. We who are engaged in the business of farming know of the discouragements that beset it.

The vicissitudes of weather are such that we are often unable in the spring to put the soil at the right time in proper condition for the planting of seed, or to get the seed planted at its appointed time. And the seeds we plant may be so inferior that they will not germinate and grow, or grow and produce crops of inferior quality and productiveness.

Periods of drought come with their exasperations, difficulties and problems. Constant rain at harvest may in a short period of time destroy the matured crop before it can be harvested, and we are not without the devastation of fire and flood.

Every crop grown upon the farm, whether fruit or vegetable, and every animal or fowl on the farm, has its insect pest or fatal disease, and the farmer must ever be on the alert and fight them with vigor or they leave destruction and death in their track.

Even the soil has its ills and its diseases, loses its power to produce, and requires the services of a soil doctor.

And then there are the perplexing questions pertaining to the marketing of the farm produce. Conditions obtain that not only prevent the marketing of certain products, but beat down and destroy the profit, and even cause the marketing of produce for less than cost of production and actual loss. Or there may be the entire lack of market,

and the farmer's produce rots in the fields. So if the farmer is not a brave man with the true spirit of fight within him, and so equipped to fight the discouragements that constantly beset the business of farming, he, too, passes under the baleful influences of discouragement.

But when he comes under such influences he can, as every other discouraged man can, gain much comfort and relief in the study of comparison. Compare your condition with your less fortunate neighbor, and you will, if your mind has not already become embittered with the spirit of a malcontent, find that after all there is much in your life for which you should be thankful, and for which you are under obligations to show yourself a man, that your less fortunate neighbor may be helped in deed and by your example.

The awful depressing shadow of discouragement must needs fall upon us all that we may better enjoy the lit up landscapes of life.

There are periods in the life of each one of us when we flee to our gardens of Gethsemane, where we fall upon our faces and pray for the passing of the cup of discouragement. For how often we exclaim: "Let me hide in the hidden cleft of the rocks far away from the haunts of men where we can be alone with Nature that she may heal the stinging wounds of discouragement." When these periods of discouragement come to us who are engaged in the business of farming, we should rise phoenix-like from its ashes, go out and seek some work, and apply ourselves to it so vigorously that it will set the sluggish blood in our veins to so active a circulation

that it will in a short time throw off our depression, and will bring us into the sunlight of hope and good cheer. And we will then be the men and women God intended we should be.

When man or woman is under the environment of discouragement, then the Devil is reaping his best harvest, for to give way to the wiles of discouragement is but seeking the courts of the Devil where we become easy prey to the multiplicity of temptations there abounding, the yielding to which brings misery and death.

In periods of sunshine we should avoid the doing of those things that are apt to bring about conditions that surely lead to discouragements. But when the trials of life do o'er take us, we must be bigger than our troubles and rise to the heights of human courage. Hard, do you say? Yes, if we allow ourselves to get the grouch habit. But if we cultivate the spirit of thankfulness and contentment, try to be satisfied with our lot in life, if there is no legitimate way to improve it, we can find much, even in the trials and sorrows of life, for which to be thankful, and much for encouragement. At least we would see success where we now see failure, or would see opportunities upon which we could lay our hold and hammer out from them success and fortune.

The farmer in the vast majority of cases has the least cause to be discouraged with his business. It always affords him shelter and something to eat and wear. He is more independent of strikes, business depression, or panics, or other disturbances in the business world than any other business or profession. So there is little excuse

for him to whine and get the grouch spirit when discouragement settles upon him.

But above everything he should avoid the "kicking habit," unless he contracts the right sort of a "kicking habit." For there are two kinds and we should strive to possess the one, the other we should avoid as we do a pestilence.

The two are easily distinguished. The one is kicking against some bad law or condition, some obnoxious person, or some wrongs that really and truly exist. The other is the kicking against the unseen, the unapproachable, Nature's immutable laws, true progress and improvement, and the natural laws of trade, commerce and finance.

John Kendrick Bangs in the little couplet

"I've never found by kicking yet
That I could make a dry day wet:
But I can make a wet day fair
By putting on a smiling air,"

shows the utter folly of kicking against conditions that no human agency could possibly change, and shows us how we may turn such conditions to our everlasting advantage.

The farmer can so easily cultivate the grouch pessimistic spirit by everlasting kicking against the unpreventable conditions, so he should ever strive to rise to sublime heights and take the sting from them with the "smiling air" which scatters the darkest clouds and lights up the most sorrowful face with luminous joy.

But the farmer should cultivate, as every other good citizen should, the true kicking spirit as

given, for I would have every farmer to be a courageous man, a man alive to the evils and wrongs that abound, and possessed with the spirit of righteous indignation and expression against them. Don't drift with the indifferent, unthinking, backboneless crowd. Be a kicker among the kickers, that do the kicking that pays. Kick against the trade and marketing evils that beset your business. Kick against the liquor traffic, child of the Devil, that has always shown itself proud of its parentage and ever the foe to your best interests, and kick from your farms any bad condition that hinders true progress, mars the happiness of yourself or family, and remember, while you are kicking, that kicking will never make a "dry day wet" or a "wet day fair," restore the spilled milk to the overturned pail, "mend the broken treasure," but that the "smiling air" will dispel the gloom of the wet and the dry day, fill another pail with milk and repair or replace the broken treasure.

In fine, we should get into the game of life and play it with the vim and vigor exercised by the athlete. Inactivity is a mental state and disease, caused largely by discouragements, and God pity the man or woman who falls under its deadly influence.

It is said that the white blood corpuscles in the blood of man are the big policemen that accompany the blood through our veins, arresting and destroying the bacteria that brings disease and death to our bodies. They are active in the body of the man or woman full of life and activity. So

if we would live possessed fully of our every faculty, we must get into the game of life with that activity that will give the white corpuscles a chance to do their work, and when we have done that, the discouragements will not overtake us.

We, too, should remember that happiness is largely a state of the mind. He who possesses a "conscience clear, a mind at ease" and can be amused by the "simple pleasures that always please," has won its elusive smile. But to possess the "conscience clear," we must be engaged in honest employment or business and give the "square deal" to our fellow man.

To possess the mind at ease is not to do the things that prick the conscience, be possessed of a healthy body and ever be industriously engaged about something worth while, ever remembering and giving due obeisance to the God that holds our destinies in his hands.

To possess the simple pleasures is within the reach of us all, for it is nothing more than enjoying the harmless pleasures that do not over excite, and stimulate, and which are incident to our stations in life, within the reach of all, and that satisfy, if our minds be in the right condition. Sighing and striving for the pleasures and the things above our station in life, even though we could possess them, would not add one mite to our happiness, and is the pricking thorn that irritates, producing the festering, poisoned sore of unrest and unhappiness.

These reflections upon discouragements and their cure are here recorded because the author knows that every farmer is subject to their in-

fluences, and if he is not helped to combat them, the business of farming is surely injured, and they constitute a good prelude to the discussion of subjects to follow.

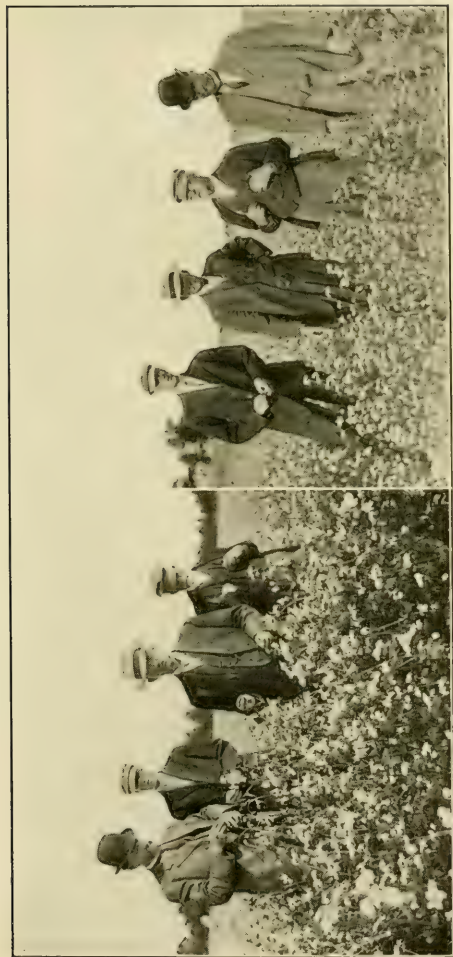
CHAPTER III

HINDRANCES TO THE BUSINESS OF FARMING

WE have already touched upon one of the chief hindrances to the business of farming, that of the resentment on the part of so large a per cent. of those engaged in the business against agricultural teaching and training. But we have shown that this condition is being fast eliminated from our farms by the rapid inauguration of agricultural teaching and training in our public schools and colleges. When our young men and women are taught and trained to agriculture, the spell of indifference, resentment to better farm methods, and pioneer environments will become broken and will no longer constitute a hindrance to the business.

In the past there has been a steady stream of boys and girls winding its way from the farm to the city. But few of the boys and girls caught up by this ever flowing stream returned to the farm. They were the best blood of the farm. True they were seeking the "better opportunity," a worthy ambition to which every one should aspire, but they should have been made to see the vision of the "better opportunity" on the farm.

The great majority of professional, business and workingmen of our cities were poured into our cities by this ceaseless stream flowing from



SHOWING RESULTS OF GREEN MANURING WITH RYE, UPON BUCKWHEAT
GROWN ON NORTHERN MICHIGAN SAND LANDS.

This picture shows a forty-acre field of buckwheat growing upon the sand farm of Edwin Russell, situated upon the shore of Lake Michigan, near Manistee, which was visited by Prof. Cyril G. Hopkins and the author in August, 1912. A heavy crop of rye had been plowed under upon thirty acres of the field, and upon the remaining ten acres, no green manuring crop or fertilizing matter had been applied. The above pictures were taken at the dividing line between the thirty and ten acres. The one on the left shows the results of the rye green manuring and the one on the right the results of no manuring. Note the height and thriftiness of the buckwheat in each picture. The author never saw a more marked difference.

Prof. Hopkins is standing at the extreme right and left, Mr. Russell at left of center and second from right. The author is third from right and left. The other gentleman was our accommodating chauffeur.

our farms. It has resulted in an over supply of men for the various businesses, trades, professions, common labor, and the founding of all manner of devices and schemes for the eking out of an existence with all their attending crimes and evils. It has given us the excess of middlemen and thus presented one of the alleged problems and hindrances to the business of farming. An ample supply of middlemen is a necessity and a benefit to the business of farming; but an over supply leads to the practice of dishonest tricks of trade, resorted to by so many of the commission men whose ranks are so over crowded that some of their number must resort to dishonesty in order to live.

We hear it said so often that "the time has come in this land of ours when more men must be producers and fewer live on the work of those who do produce." This is good philosophy, but what would happen if all men were producers? From whence would we secure the people to consume our products? What we most need is the removal of the barriers thrown between the producer and the consumer—the barrier of excessive freight, the exacting, dishonest commission men, wholesaler, and retailer. And we need the betterment of labor conditions so that the laboring men of our cities may receive a living wage, for he is the great consumer of farm products. So when you put these farm products at his door and at the right price, and he is receiving ample wages, he will purchase them in such quantities that the farm will have to hump itself to produce them. Our produce will command the price that

pays the profit, and farm conditions will be so improved that more men will go into the business of farming, and the congestion of workers in our cities will be relieved.

The author does not believe it possible or practicable to entirely eliminate the middlemen standing between the farmer and the consumer. Like every question it has its two sides. The middlemen have done a great work for our country. Stop and consider their achievements. They have built our cities with their massive business blocks, hotels, churches, school buildings, libraries, universities, colleges and beautiful residences. They have erected, put, and kept in operation our manufacturing plants, that have led to the invention and manufacture of those splendid, wonderful and varied machines, devices, goods, wares, and merchandise that have lightened toil, lessened labor, and contributed to our enjoyment in a thousand ways, and that have cheapened the necessities of life, and have given us opportunities of living never enjoyed by any age of the world's history.

They have furnished the money to build our railroads, steam ships, and canals. They have established banks that have furnished much of the capital to carry on farm operations.

They have almost universally contributed the capital by which have been made possible our church organizations that have carried on and promulgated the religion of the Christ, the very foundation of good society, and the erection and maintaining of the hospitals where the diseases and frailties of man have been cured and cor-

rected, sending joy, happiness and good cheer to the afflicted and distressed.

You can scarcely lay your finger upon a single enterprise of any kind or character in any community, but what has been promoted by the so-called middleman, and pushed to completion, or continued in operation by his money, his brains, and enterprise. Entirely to eliminate him from our business economy is but the fancied dream of the scheming politician, promulgated to keep him in power. The thoughtful man knows that the sensible thing to do is to eliminate the evils that have crept into the middle class, and promulgate the things that will so bring together the producer, the middleman and the consumer, that the producer and the middleman can live and prosper, and the consumer will purchase his products that will eliminate the high cost of living and put us all upon the plane of better living.

That there are too many middlemen there is no question. Fifty years ago twelve out of every fifteen people in the United States engaged in agriculture. Now, out of every four of our population, three are living in the city and are not producers. Yet if you will take a census of the so-called middlemen it will show just as we have already stated that they were mainly recruited from the ranks of the producers or from the farm, and the very reason they joined the ranks of the middle class was that they were seeking to better their condition. If those things had been done that would have made farm life more profitable and better, and improved the opportunities

of the farm, they never would have left the farm.

When soil building and fertility maintenance, and methods of better living are emphasized upon the farm, more people will remain upon, or go back to the farm. It is our natural instinct to live in agreeable and social surroundings, and if we do not find these things in one place we seek for them in another.

Man likes to engage in the business that is congenial to his tastes, if it pays. Some men will engage in the most miserable and soul destroying business simply because there is money to be made in it, but the majority prefer an honorable business.

The business of farming is conceded to be the most independent business on earth, and it can be made the most enjoyable business, and a profitable business. That it has been a business of drudgery full of hard work there is no question, but the wonderful changes in farm machinery and appliances for comfort, and work relieving devices, have made it become a business no more irksome than any other business, and it can, in fact, be made as easy as any business. When the author says these things he is not writing theory, he is writing knowledge gained from practice. He worked at farm labor when the hours were long and the farm work was done chiefly by brawn, with no improved farm machinery to help.

He has stood behind the counter in the city store from six o'clock in the morning until ten o'clock at night, with but the short cessation of going to meals, waiting on scores of exacting, irri-

table customers, until he was tired in body and in mind. He has toiled from ten to twelve hours a day at the stone and brick mason trade. He practiced law for more than a score of years, with a large clientage, and did office work, and tried law suits until his body was so tired and brain so jaded that he could scarcely sleep.

He has managed and carried on a manufacturing business with its perplexing and harassing problems, annoyances and drawbacks, and he knows much of the modern methods of farming.

To remove many of the hindrances to the business of farming those engaged in it must develop the social side of the farmer's life. At present it is the least developed. The coöperative organizations among the farmers along the lines that will draw them together so that they may discuss the problems pertaining to their business should be encouraged. Every other business has similar organizations which not only promote better business, but also develop the social side and thus provide the recreation that every one needs, and which helps so much to make smooth the rough places of life's pathway. When the social side of the business of farming has been so developed that every farm community will be supplied with those organizations that give to every one engaged in the business the opportunity to secure better farm methods and better farm living, then the stream of humanity flowing from country to city will be stayed.

There is a farmers' society which assails the movement to increase crop yields upon the ground that large crop yields will injure instead of bene-

fit the farmer, unless marketing conditions are improved. It even asserts that the movement of better farming is backed by produce exchanges and boards of trade who are old enemies of the farmer with new faces, because they are operating through the agricultural colleges, and who are seeking by improved methods of farming to have produced an over-supply of farm products so that they may buy it at low prices and sell at high prices.

In fine, this society would have every farmer to install upon his farm those methods which produce worn and worn-out soils and so limit the production of farm produce. In other words, the members of this society would have our agricultural economy augmented with worn, worn-out and abandoned soils, and with discouraged, unambitious farmers, as a means of enhancing the prices of the small, inferior amount of produce, that would result if such a condition should obtain upon our soils.

Surely in this age when a multiplicity of brain-storm reforms are sweeping over our land like cyclones, it behooveth the American farmer to keep close to shelter.

The author asserts without fear of successful contradiction that no matter how extensively better farm methods may be installed upon our farms, the time is not in sight when the staple lines of farm produce like wheat, corn, oats, rye, hay, etc., and live stock, are likely to be produced in such quantity that they will not sell from the farm at a profit.

This condition may obtain with fruits and veg-

etables unless barriers of transportation and marketing be removed, but with those hindrances brushed away there is a market for all the fruits and vegetables produced upon our farms at prices that compensate the grower.

In the matter of the buying of goods, there is a hindrance to the business of farming worthy of a most serious consideration.

The author does not question the right of any farmer to buy goods in the cheapest market, but he does deplore the fact that so many farmers purchase so much of their groceries, furniture and other necessities, through the mail order houses. We should not forget that it is the home merchant that purchases much, if not all, of our produce, and bears the greater burden of taxation which gives us the protection of society and better highways; in fine, every improvement that benefits the farmer. He builds our cities and gives us the markets that enhance the value of our lands, and in many instances gives us the accommodation of credit. And to forget him, and not to purchase his wares, especially when in nine cases out of ten, he gives us better goods at the same prices charged by the mail order houses, is ingratitude, and ingratitude is the basest of sins.

As members of society we must "give and take." We give up certain of our liberties that the remainder may be the better protected. Our very natures are such that we must ever have the restraining hand of law over us. This makes necessary the existence of a government, and this government must extend to every community, and under our system has resulted in a state of exist-

ence unequaled by any in the world. We have prospered mightily and the business of farming has been given an opportunity that has pushed this country to its present position. To make any country prosperous and great it must be composed of many small, well regulated, prosperous communities, units or parts, and each citizen composing these parts must have at heart every feature of the community in which he lives, for the prosperity of the people and their business, the churches, the schools, the betterment of the roads and the highways, contribute to his prosperity and the promotion of his happiness.

If every citizen would take no interest in home affairs and would buy all his wares and merchandise through the mail order houses, what kind of a community would his community be? The mail order house contributes nothing to, nor cares anything for, your community. Its sole care is that it may get your dollar.

To-day, and in the past, the so-called middleman has not only furnished the money for the charitable institutions, hospitals, etc., but the money that has led up to better farm methods. The farmer has only contributed when forced to by taxation. The middleman has led. Before you shake him down, consider these things; if he has grown arrogant, there is a way to reach him, but give him due credit for the things he has done.

In these days we are hearing much about co-operation among farmers by which they may obtain better prices for their grain, their stock, and their various farm products; that we should have those farm societies whose object is to make

farmers fix the minimum price for his produce.

It is a sin and a shame to see thousands of bushels of apples lie rotting upon the ground, as the author has seen them this year in the Middle West for want of a market, when so many thousands in our cities can not obtain them at a price which they can afford to pay. And this very thing happens every year with some line of vegetable or fruit. The fault lies in the methods of distribution and marketing,—chiefly in the marketing. Commission men, looking of course solely to their own interests, are adverse to an over supply of any one vegetable or fruit, so they maintain prices, and take steps to prevent produce from reaching the market in quantities. Much of this evil can be eliminated by the establishment of markets in all of our cities of any considerable size, under the management and control of city authorities. Cities assume jurisdiction over gas, light and water companies, and the management and control of those things that maintain health and relieve disease and distress, and why not assume jurisdiction and control over those methods and devices which will lead to a better distribution and marketing of food supplies by which all the people of our cities may obtain food in ample amounts and at a reasonable price? If such were done then when there was a plethora of farm products, waste would be eliminated, our people would have the opportunity to be fed with food at reasonable prices, and high prices would only prevail in cases of a failure or partial failure of crops.

I do not believe that coöperative grain com-

panies, creameries, canning companies or any company composed of farmers for the better marketing of farm products, will ever solve the question of the better marketing of farm products and the obtaining of better prices.

After all, these companies are nothing more than the simple changing or shifting of middlemen. It requires the same number of men, possessing the requisite skill to manage and carry on the coöperative enterprises, as it does to manage and carry on the non-coöperative enterprises. Therefore you must either employ the managers and employés to operate these coöperative concerns from the ranks of the non-coöperative concerns, or take them from the ranks of the farmers, and when you take them from the ranks of the farmers you eliminate that many men from the business of farming, and the business of farming suffers to that extent, and you put these farmers into a business for which they have no training or adaptation, and too often they do not make good, and the coöperative concerns fail. The highways of the business world are to-day strewn with the wrecks of these coöperative concerns. Some have made good, but the author is sure the majority have not. Every man to his business and every man to his trade, is absolutely necessary for the greater success. But after all, the coöperative concerns must sell their products to non-coöperative concerns, so they do not enhance profits, but simply divide the profits of their business among their stockholders.

But assuming that the coöperative concerns are

a success, you simply change the class of middlemen and cause a different distribution of the profits. But if they succeed in appreciating prices of farm products, to any great extent, would they not be combinations to boost prices, just as much as the great trusts organized for the boosting of prices, and therefore, be unlawful?

Within the last twenty years the author has seen the rich lands of the corn belt, now valued at \$200 per acre, begging for buyers at \$35 or \$40 per acre. Corn was selling for 15 cents per bushel and other farm products in like proportion. In those days no coöperative movement on earth was powerful enough to bring about conditions that would enhance the prices, for there was a plethora of farm products and not enough consumers to consume them. When consumption caught up with production, then farm products began to enhance and prices of lands increase.

The Medesian law of supply and demand will ever govern the price of commodities. If low prices prevail, the remedy is more consumers and better facilities for the better and cheaper transportation of products to the consumer, or the organization which has for its purpose the storage and withholding from the market of products until prices adjust themselves to a higher level or the market is bare of products, which will cause appreciation.

But after all are we not natural born kickers? We seem to overlook the unalterable laws of business and trade. That in the business world as well as in the moral and natural world "periods of energy and faith are succeeded by ages of doubt

and sloth." That periods of high prices are succeeded by periods of low prices. That if we eat to surfeit we must needs fast. That if we over expand in business transactions a period of contraction with its distress must come. The stern law of compensation obtains in every transaction of business and life. Some things we can change or reform. Many we cannot. Let us remove every hindrance to the business of farming that can be removed.

The following perfectly true account which can be verified, taken from the *New York World*, shows that the farmer of the present century, with its apparent evils, has, after all, much for which to be thankful, when he considers his lot with the lot of the farmer living in the past ages.

"A countryman living just beyond the outskirts of London, drove to the metropolis one day to order a few provisions, etc.

"The countryman first went to the nearest cobbler's. There he bought a good pair of shoes. Not shoddy footwear, carelessly turned out or even machine made, but hand-sewed and of fine, strong leather. For this pair of shoes he paid just seven cents.

"Next he drove to a butcher stall in Smithfield. There he bought a sheep, a dozen chickens and ten pounds of beef. For the sheep he paid ten cents. For the chickens he paid one and one-half cents apiece, or eighteen cents for the dozen. The ten pounds of beef cost him a nickel. For beef was half a cent a pound.

"Stowing away his purchases in his big wagon, the farmer next stopped at a fish stall, where for ten cents he bought twenty-five big codfish.

"His visit to the grain merchant cost him more. For he was forced to pay fifteen cents for a bushel of rye—a sum out of all proportion to his earlier purchases. It was cheaper, you see, to buy meat than the rye bread to eat with it.

“But his ensuing trip to the draper’s for enough homespun cloth to provide him with a winter suit, atoned for the high price of the grain for he found that stout homespun cloth was selling at twelve cents an ell, or nine and three-fifths cents a yard.

“The farmer had no trouble in carrying his wares home in his wagon. For the wagon was large. He had driven it to London full of firewood, and this wagon load of wood he had sold for thirteen cents.

“The foregoing prices are all accurate. The high cost of living had not yet hit England. For, you see, all this happened several years ago.

“In fact, it was the beginning of the sixteenth century.”

There are abuses in the marketing of products that must be corrected even if resort to coöperation that results in loss, becomes necessary.

For instance, there are commission men in scores of cities who solicit consignments of produce which they agree to sell as choice products, and at the highest prices that can be obtained. However, when farmers get their returns for produce shipped, language is used not conducive either to the spread of religion or strict belief in the natural law of supply and demand. Produce of the choicest quality is shipped these commission men, the returns from which do not meet the cost of production, and in many cases the shippers are called upon to pay alleged losses. The excuse of “overstocked markets” is made to cover a multitude of sins committed by these commission men.

A recent investigation in New York City revealed criminal conditions. The truckers of Long Island had been shipping their produce to these New York City commission men, with not enough returns to pay expenses, and they received so

many reports of "overstocked markets" and other excuses, that the worm turned and struck back. Investigation disclosed that the journey of the produce from garden to consumer passed through from three to seven intermediaries. That these alleged commission men bought directly for their own account, thus not only violating the laws of agency, but of honesty and common decency. They went further into the filth of dishonesty and sold the produce to fictitious firms, even to their own wives and children. It was found that these men by these methods, without a dollar of capital invested, were able to roll along the Riverside Drive in fine motor cars and sail up the Hudson in luxuriously furnished yachts, while the Long Island produce was being grown by the producers at an actual loss. Do you wonder then, that these Long Island producers, when they became wise, devised the "Long Island Home Hamper" scheme, by which their produce was brought to the kitchens of the consumer, and at a fine profit to themselves, and at a big saving to the consumer? Mr. Dishonest Commission Man was left to reflect amid the ashes of his wrecked illegitimate business upon the old time maxim "Honesty is the best policy."

A similar condition as to dishonest commission men and ruinous prices and robbery of the producer has obtained in nearly every city of our land. And if honest commission men and merchants do not quickly take drastic measures to eliminate these conditions from their ranks, and establish those methods by which producers will obtain for their produce the living price, and the consumer can buy it at prices that ought to obtain under

legitimate conditions of supply and demand, then their businesses are doomed.

The perfected parcel post has opened the way to the consumer, and has brought him and the producer closer together, and will eliminate much of the evil of market garden and fruit products, but it comes far from entirely solving the marketing problem. All consumers do not or are not in position to avail themselves of its advantages. And all consumers and producers are not strictly honest. The producer does not always send the honest quality filled package, and the consumer too, resorts to dishonest tricks. Unless honest commission men reform their business and entirely eliminate the evils from it, then the author believes that resort must be had to the municipal market. That is the market we have already referred to under municipal control where the producer can bring and display his produce and meet the consumer face to face, where they can market upon the true merits of the produce and at honest competition regulated by supply and demand.

These markets have been established in many cities the past year of 1913 and the author knows they have been a success. Yet he can see where even they do not solve all the farmer's marketing problems. Not all farmers can take the time to go to the city market and sell their produce. Other work demands his attention as well. So after trying all the remedies of parcel post, municipal markets, etc., do we not get right back to the best system of all, the getting closer together of the farmer and his merchant, and devising methods by which the farmer gets a fair price for his

products, the merchant, the middle man, getting a fair share for his trouble and expense of distribution to the consumer, and yet the consumer getting the produce at a price that eliminates much of the cost of high living? Does not this system, as we have shown, partake of the "give and take" plan of society, by which we each give up certain liberties and privileges that the remainder may be the better protected? After all is there not something more in this life than the farmer, the middleman, and the consumer receiving the exorbitant profits and cheaper products? We all want to get the best out of life in the way of better homes and home equipments, better surroundings, better highways, better schools and churches, better amusements, better government, yea, the better opportunity. But to get these things we must "give and take." If men and women will live in the towns and cities which they claim give them the better opportunities for the best living, then should they not pay the price for such opportunities? Let us remember that it is not wealth alone that gives the best and right living. We must be interested in every part and portion of our community if we are going to get the best out of our life. It will never be possible for each one of us to withdraw or to think that we can withdraw from the activities of our communities, shut ourselves up as it were, and say we will have nothing to do with them. We each must concede something for the betterment of our communities.

The high cost of living cannot entirely be laid at the feet of the producer. The fault lies largely with the consumer. He has demanded systems

of delivery and methods of living never dreamed of by his fathers, all of which has enhanced the cost of his living. When the author first began married life in the city, he bought his groceries largely in bulk, and did his own delivering. A system of water works, electric lighting, and other luxuries could not be obtained. But when they could be secured and were installed, they each brought their necessary appurtenances, which increased the cost of living. Many luxuries we now enjoy have seemingly become necessities. They are legitimate and make life more enjoyable, but add to the high cost of living. And yet when we did not have them we perhaps enjoyed life as well as we do now, and were not so worried with the expense that now greets us on every hand. If we must have all the advantages of modern civilization we must expect to pay for them, and should give these advantages due consideration when we are considering the problems of to-day and how to solve them.

The thought has been expressed that, as our nation has practically conquered all her virgin soils and subdued them to cultivation, planted her cities on every hill and plain, established schools, colleges and libraries in every portion of her domain, improved the highways and mail system so the mail and newspapers are being brought to every home, it has given us more men of leisure, and so a spirit has taken possession of our people which is leading out towards the reformation of all the real and imaginary public and private abuses that beset us. We do indeed see this spirit manifested upon every hand. In political parties

and in national, state, and municipal governments. It has plunged our nation into a spirit of "unrest," that has made us "reform mad." Multitudinous organizations have sprung up on every hand with reformation or correcting of alleged evils as their purpose, which have influenced our legislative bodies of cities, states and nation to fill to a surfeit our statute books with laws for the regulation of everything imaginable, whose objects are to correct real and imaginary evils and so many of which are never enforced.

Many of these would-be reformatory laws strike at old unalterable laws of trade, commerce and society, that no legislative enactment can ever alter, change or reform. Yet in the maddening desire to reform something, the very conditions that bring about much of the evils of society are entirely overlooked. We enact the laws that simply lop off the branches of the tree of evil instead of the law that will strike at its root so as to destroy the tree itself.

It is universally admitted that the liquor traffic is the source of nearly all crime, poverty and impurity, costing our nation incomputable sums of money to pay for its destruction and devastation, yet when we strike at this monstrous tree of evil we lop off a branch here and there with a state prohibitive, local option, or regulative license trimmer, which may mar the shape of the tree, but the tree lives on and seems none the worse for the trimming. Is it not time we strike at the tree's root with one single nation wide prohibition against the manufacture and sale of intoxicating liquors, and at one blow eliminate a multitude

of evils responsible for the numerous conditions against which we have been so long, and against which we are now directing so great a body of reform measures?

The evolution of modern businesses, the natural result of changed conditions of society, has thrown us into a reformatory fit and so much energy of speech, writing and legislative enactments, has been directed against the concentration of capital into great business combinations, which have actually brought about better business methods of manufacturing and transportation by which manufactured products have been cheapened one-half or more, and scores of men have been given employment, and better conditions, both as to prices and employment, have been obtained that never could have been secured by the individual acting alone. Yet these combinations of capital which have brought these bettered conditions and advantages to the people, have been denounced and legislated against as the most monstrous of evils that should not be allowed to exist, even under proper regulation. And writers and speakers who see both the good and the evils in these combinations of capital, and know that the proper thing is to regulate the evil out of them and encourage the good in them, are cowed and become afraid to express their honest thoughts and convictions regarding them.

CHAPTER IV

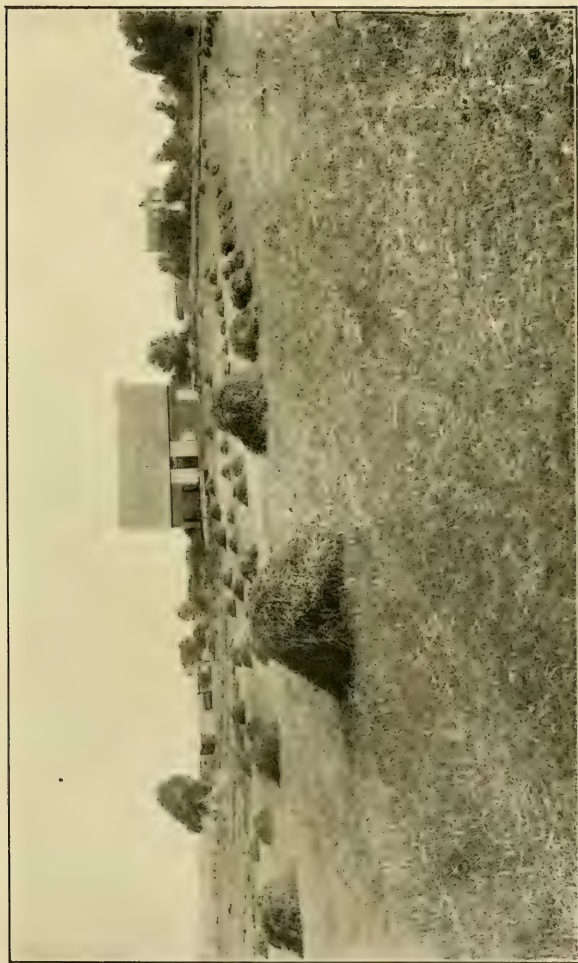
OUR WORN SOILS THE GREATEST MENACE TO THE BUSINESS OF FARMING AND HOW TO RESTORE THEM

THE menace of worn soils, the farm's most serious problem, deserves further comment in a special chapter, notwithstanding we have already said much about it and other menaces to the business of farming.

We have shown how the "whip and spur" method of farming so long practiced in the United States, by which our soils have been subjected to the process of getting all you can out of them without the return of anything to maintain or increase fertility, has so exhausted vast areas of our soils that they no longer produce paying crops. Any soil that will not produce crops that more than pay for the cost of production, is a worn-out soil, and we must not be blind to the fact that they exist even to alarming proportions in every part and portion of our country, yea, in those portions that boast of their rich soils.

We have shown that a greedy husbandry, a sordid tillage, lack of capital, deceptive theories like crop rotation, etc., have been producers of worn and worn-out soils.

There are scores of farms in the abandoned farm districts of the East, a humid region where



FIRST CROP OF ALFALFA ON WORN SOIL.

The soil of this field is sandy with gravel subsoil. It is so rocky in the center of the field that it could not be plowed to exceed four inches in depth. Every crop the author attempted to grow upon it was a failure until alfalfa was tried. The soil was prepared in the best possible manner and seed was inoculated with artificial cultures and sown Aug. 16, 1912. The above picture was taken June, 1913, and shows as large a crop of a single cutting the author ever took from his best alfalfa lands.

the rainfall is sufficient to insure perfect crop growth, capable of producing enough to feed millions of people that now lie like fallow soil, growing back into a wilderness as dense as the wilderness from which they were rescued centuries ago. These farms are set in landscapes beautiful beyond comparison, interspersed by perfect roads, watered by springs and streams of never failing sparkling pure water, much of which can be harnessed by dams and made to move the wheels that will manufacture the electricity to light the homes, barns, and move the many machines now manufactured for the farmer's use.

Why has the desolation of abandonment spread its solemn mantle over this splendid region, once busy with toiling, yet happy, prosperous people, owners of delightful homes surrounded by glorious church and educational privileges?

The lure of the West and of the city threw its spell around its young people. They wandered from the old homestead. The God fearing and peace loving father and mother sat empty hearted, desolate and distressed around the hearthstone, stared with aching eyes and broken hearts into the vacant chairs; sorrowed away their lives, died and were laid to rest in the country churchyard, and no one was left to care for the old farm, for the young people who had left the old homes were yet beneath the influence of the spell that led them away, or were bowed down by circumstances that would not allow them to come back to their childhood's home. So these farms became tenantless, the hand of abandonment fell upon them.

Yet there was an underlying cause for this state

of affairs that we all overlook, and it is the great American farm tragedy. If these farms had been producing the wealth that prosperous farms should produce, would all the younger generation have deserted them? Surely some would have remained behind to share and enjoy them. If we but search to the bottom of the whole matter we will find that these farms had been farmed for years under a system of farm procedure that made their fields sterile and barren. So long as they produced large crops they prospered their owners. Fine farm buildings were erected and homes with the comforts of life abounded, but as these soils became worn, crop production lessened, the spell cast by worn and worn-out soil spread its blighting influences throughout fields, valleys and homesteads, and the inhabitants thereof, especially the younger generations, fell easy victims to the lure of the city or of the West.

'Tis true that the lure of the city and of the West have ever been some of the world's greatest tragedies. Men and women have come under their seeming benign influence ever since cities were builded and the 'course of empires westward took their way,' and will continue as long as cities exist, and until all the soils of the globe have been conquered and subdued to man's service. And the world will never know the heart aches suffered around the firesides of the homes they have desolated of their young manhood and womanhood.

But we do not believe the lure of the city and of the West will cast so great a spell about our people if conditions obtain that will dispel the

curse of worn-out soils, and bring the soil back to where it will cheerfully take up again its burden of bearing crops that pay the profit, for when this is done possibilities of better farm living are made possible in every part and portion of our land, and the advantage of farm living will more than equal those of city living or elsewhere.

But the worn soil problem confronts us and we can not get away from it. Can these soils be restored? If so, how? The plan adopted for their restoration must be one of quick action, for we can not wait fifty years as England did to restore our worn-out soils.

A fertile soil, or one that will produce paying crops, is composed of certain minerals, plenty of organic matter, humus, soil bacteria, and is well ventilated.

As a general rule the soil stratum of most all our soils has in it the necessary minerals, like potash, etc., to supply the needs of plant growth for centuries. All virgin soils abound in all the other elements that make up a fertile soil, but when virgin soils are brought under cultivation and are subjected to years of tillage that has no thought of soil conservation, the elements of organic matter, humus, and nitrogen, become exhausted, these soils are no longer a favorable home for soil bacteria, they become cold and compact, ventilation is shut off, and they pass into the class of worn-out soils.

The element soonest farmed out of fertile soils is nitrogen. This element is considered the "most precious, the most important and the most costly" of all the soil elements. Virgin soil procured its

supply of nitrogen from decaying vegetation or organic matter, and from the air through the work of those soil bacteria, which make their homes in the root nodules of those plants known as the nitrogen gathering plants or the legumes, and who draw for their food the nitrogen from the air, and drawing more than they need, store the surplus in the soil where it becomes available for plant food.

Worn-out soils are always deficient in ventilation, organic matter, nitrogen, humus and soil bacteria.

Soils must be ventilated so that bacteria may live in them and that oxygen may reach the plant roots, for we have stated that it is as necessary for plant roots to breathe as human or animal beings.

If we would but reflect and investigate we will find that in human, animal, insect and vegetable life, and even in inanimate substances, the greatest law is the law of service. Men and women make their lives one of service for their families and fellowmen. In the animal world one animal gives up its life that man or another animal may live. One insect is made to serve as food for another. The plant grows in the soil and with its roots caresses the rock particles of the soil stored with mineral plant food, and coaxes from them the mineral wealth which it utilizes for its food, lives its life, dies, and gives its body back to the soil to decay and become the food of soil bacteria whose mission is to compound the decaying body of the plant into plant food and humus for future plant growth. All have been lives of service, and

without this law of service neither can live.

The soil is bound by the same law of service and gives up its life elements that plants may live and grow and bear their burden of harvest that they too may render service to man. But soil can not live and render service unless service has been rendered unto it by plants and other fertilizing agencies, so that it may gather the fertility that it gives back in service.

So in the restoration of worn soils we must simply study the law of service and compensation, and when we do this we find that soils must have organic matter in them to furnish food for soil bacteria, so that the bacteria may compound and distribute the substances needed for plant food, and cleanse the soil of its offensive accumulations. And soils must have in them the nitrogen to promote the growth of plants and the soil ventilation which is secured by drainage, and by incorporating into it large quantities of organic matter. Organic matter is put into the soil for its use by plowing under of manure, cornstalks, straw or any green manuring crop, or vegetable, or plant residue.

We have already showed that the first aid to the restoration of worn-out soils is through drainage—drainage constructed with the thought of soils ventilation, and that the next aid is the securing for it an abundance of organic matter. Manure is considered by many the best organic matter, but as it cannot generally be secured in sufficient quantities, we must look to other sources for supplies.

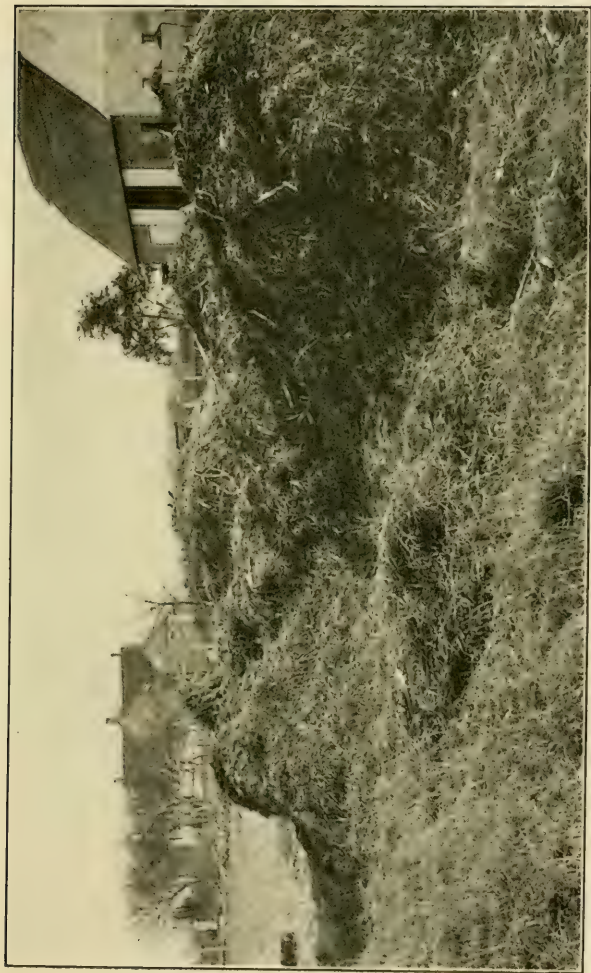
The next best source of securing a supply of

organic matter is the growing of crops like red and sweet clover, alfalfa, vetch, rye, hungarian, buckwheat, etc. Clover and alfalfa cannot generally be grown on worn-out soils without the use of some stimulant like nitrate of soda, limestone, etc., to give them a start. If by the use of a stimulant we can get a stand of clover and alfalfa and plow under the entire clover crop and allow the alfalfa to stand for several years, cutting it in its proper season, we will have secured a valuable supply of organic matter and nitrogen for worn-out soils.

By far the best crops for furnishing organic matter for worn-out soils are the vetches, sand, winter, or hairy vetch, sweet clover and rye. These crops do not require any stimulant to make them take hold upon our worn-out soils and they quickly furnish large quantities of organic matter.

For years we have been preaching and practicing the religion of an abundance of organic matter for all our soils, whether fertile, worn, worn-out or abandoned. We have not only preached and practiced this faith, but have dreamed about it, and our dreams have been that the feeding of our soils an abundance of organic matter will make more fertile our fertile soils, and will so restore to fertility our worn, worn-out and abandoned soils, that we will again be a nation possessing the fertile soils we possessed when our continent was first discovered.

The a, b, c of a permanent agriculture is a soil filled with organic matter, for organic matter was the a, b, c of soil building. With it Nature fash-



A POOR WAY TO CONSERVE MANURE.

While to depend upon animal manure to maintain the fertility of the average farm means that the majority of its soil will go hungry for soil food, yet that is no excuse for neglecting to use the best methods for conserving every part and portion of all the manure produced.

ioned and framed the soil into its fertile stage and fitted it for the service of the husbandman.

After Nature had broken up and spread over the earth's surface the rock particles found in our soils, in the course of time she filled these rock particles with all kinds of growing vegetation. Much of this vegetation through their root nodules and soil bacteria drew from the air into the soil for its use the soil's most precious element, nitrogen. And even in this day when the husbandman strips the soil of its fertility under the lash of continuous crop growing, and without manural compensation, until it refuses longer to be driven and it is abandoned by its heartless owner, Nature, with the spirit of the kind Samaritan, proceeds to cure its ills with the medicine of organic matter.

A " 'forty-niner" who faced death in crossing the barren, death dealing plains of our once called Great American Desert, told the author that when digging for gold in our Golden State, he once dug a shaft into solid granite for a depth of seventy feet, and that out of the broken pieces of granite taken from the bottom of this shaft and thrown upon the top of the dump, there sprang plants the genus of which he nor any one else that he could find had ever seen before. These plants were but the simple tools of Nature by which she was seeking to disintegrate these granite particles and mix them up with the organic matter produced by the plants she fashioned to grow in the pieces of granite, that she might prepare a soil for man's use in growing crops for his service. What a lesson is taught by this observation of

the old miner. The author thinks of it every time he looks at a piece of worn-out soil. Does it not remind us that when any soils are no longer submitted to cultivation, Nature starts the growing of some species of weeds upon them, in time to be followed with growing grasses and the trees native to the locality where the soils are situated. The weeds, grass, and trees furnish the organic matter that mixes with the soil, and their roots extract from the rock particles of the soil the minerals needed in plant growth and so restores these soils again to fertility.

From these examples we ought to get the vision that the restoration of worn-out soils simply means the feeding of them an abundance of organic matter furnished by a system of animal and green manuring.

This is not a new system of fertility building we are emphasizing. It is "Nature's Way" which has been known to agriculture since God inaugurated the first business, the business of farming. It is the only sure, safe, and solid foundation upon which we may build a permanent agriculture. There are valuable aids and stimulants like rock phosphate, ground limestone, nitrate of soda, potash, drainage, soil covering, crop rotation, right plowing, proper tillage, and cultivation, some of which should be, and some of which must be, employed to promote the proper growth and assimilation of organic matter, but organic matter is the keystone that makes the permanent arch of agriculture upon which it is made possible to build a fertile soil.

The author's critics in passing judgment upon

this volume will no doubt condemn the repetition we have practiced regarding the merits and uses of organic matter. Our only excuse for this repetition is that the importance of organic matter to the soils, and permanency of the business of farming, demands that its value and necessity be emphasized over and over again until it is so burned into the brain of every owner and tiller of the soil that its use for fertility building and soil restoration will become universal.

Strange as it may seem, it is nevertheless the truth, that so many tillers of the soil, although they recognize the importance of organic matter in their business, seem utterly helpless to devise and put into execution methods by which they can obtain it for their sick and ailing soils.

Much of this is due to effects of environment, prejudice engendered by jealousy, lack of capital, experience and education, and failures that could have been avoided.

We have shown how environment sets a man in his ways of doing things, that might be done with safety under certain conditions, that cannot be done under changed conditions without failure and disaster. We have often given demonstrations of the use of organic matter in its various forms that produced profitable and the finest results, yet men would see and acknowledge them and yet never did apply the same remedy to their own sick and dying soils.

We have been laughed at for growing crops of rye and vetch sown in growing corn at end of cultivating season, allowing same to grow and cover the soil during fall and winter season without

pasturing, and then plowing under the same together with the corn stalks in the spring to the depth of nine or more inches. We were called foolish for not utilizing the pasture that this method afforded, yet, by this method of procedure, we restored worn-out soil to a fertility that made it produce profitable crops and doubled its value.

We have grown crops of fine alfalfa on worn soil in the driest of seasons, which afforded an abundance of hay and pasture for all kinds of stock throughout the entire summer and fall season, when neighbors' fields were bare, and they were compelled to have their children to herd their cattle along the roadsides that they might graze the little dried up blue grass that had escaped the ravages of drouth. Why did they not imitate the example set before them? It was for some of the reasons stated.

We make a mistake by not feeding our soils enough organic matter. In feeding organic matter to soils we must somewhat follow the rules of stock feeding. No animal will grow to maturity in a first class and profitable condition unless it has been constantly fed sufficient and the right kind of food. We can not feed to-day and starve to-morrow and expect profitable results. It is the same with our wearing soils. One dose or feed of organic matter every three or four years is not sufficient, for organic matter in the soil is consumed in plant growth so fast that its supply is soon exhausted unless some method has been inaugurated upon the farm by which constant supplies can be secured to the soil. Therefore the system of animal and green manuring we es-



A GREEN MANURING AND COVER CROP AMONG THE CORN STALKS, ALL FOR THE SOIL'S COMPENSATION FOR GROWING CROPS FOR ITS OWNER.

tablish must be such a one that furnishes the organic matter in abundance each year. We need not fear an over production of organic matter for our soils.

It is easy to provide upon every farm a system that will furnish each year an abundance of organic matter. When cultivation has been finished in the corn crop, sow one and one-half bushels of rye to the acre or forty pounds of hairy vetch to the acre, or a mixture of one bushel of rye and twenty pounds of hairy vetch to the acre, and an abundance of the best organic matter obtainable will be furnished in time for plowing under in the following spring.

After wheat harvest disc up the stubble and sow hungarian and you will have a fine crop of organic matter for turning under in the fall to follow with wheat. Or if the stubble ground is wanted for corn the next season, then disc up and sow to rye or hairy vetch, or a mixture of the two. By a little thought, a little planning, quite a good deal of energy and some work, many ways can be devised by which your soils will each year be furnished with an abundance of organic matter if you do not have sufficient supplies of manure.

Many contend that one crop of clover every three or four years supplies sufficient organic matter for our soils. Never was a greater fallacy promulgated if the clover crop is handled as it is usually handled upon the average farm, which is to remove both hay and seed crop and then pasture until nothing remains but the root system. The root system of clover will furnish too small an amount of organic matter so the little you would

get from one crop in the course of three or four years would not suffice, and this fact no doubt accounts for the fact that where clover is depended upon to furnish the fertility of our soils, there we have an abundance of worn and worn-out soils, in fine, the soils become so that they will no longer produce clover in quantity.

Clover has been chiefly grown upon our soils because it was believed to be an organic matter producer and one of the nitrogen gathering plants that gathers the nitrogen from the air and stores it into the soil. And yet it is a notorious fact that all lands that grow clover for a series of years become "clover sick" and refuse to grow it at all. Millions of dollars have been invested in clover seed which never brought back a penny in crop returns. Soil becomes clover sick because it has lost its lime and organic matter content, chiefly on account of the latter. Restore lime by the use of ground limestone, from two to six tons per acre, grow green manuring crops like rye, vetch and sweet clover, that furnish large quantities of organic matter, and you get the soil in condition again to grow clover.

The author has seen worn soil that refused to grow clover, planted to rye, the rye was sown in the corn in August, and the rye and corn stalks all plowed under in the spring. After one or two crops of the organic matter that this system furnished had been plowed into this soil, big crops of clover was grown upon it again.

For the past seven years rye has been, with the author and numerous of his acquaintances as well, one of his chief organic matter producers.

And for this plant as an organic producer, he has none but the highest praise. It can be sown in the fall in corn or in the open, at a cost of less than two dollars per acre for seed, and the labor required to sow it is hardly worthy of consideration, for the farmer, generally, is not pushed with his work at this season. It quickly grows to sufficient size to furnish the finest cover crop for winter and spring, thus giving the great advantage obtained to the soil by the use of a cover crop. Then it quickly springs up to sufficient height in the spring for plowing under in time for the planting of the corn crop. It fills the soil for a depth of eight or nine inches with a splendid root system containing an immense amount of organic matter, rendering the soil loose or friable. If the farmer thinks he must pasture his stock fields, or is in sore need of pasture that he can not supply elsewhere, the author knows of no plant grown on the farm that will produce fall, winter and spring pasture quicker and so abundantly as rye. And yet, in spite of any severe pasturing you may give it, its large root system will give an abundance of organic matter for the soil. And the best characteristic of the rye plant is its ability to grow, flourish, and produce abundantly in any soil, no matter how poor, without aids or stimulants. It is truly the best and cheapest green manuring crop for the farm, and yet one of the least appreciated and understood by the farmer. The author speaks thus of rye, after years of careful experience with it upon his own land and land he has rented, and careful observation of the experiences of other farmers with the plant.

A striking experience and observation came to him during the season of 1913. Near his home is situated a prairie. It is a stretch of Wabash river bottom land of a thousand or more acres, surrounded by hills from the crest of which a view of the entire prairie is had. This tract of land when first subjected to cultivation was the richest of land. It has been farmed for nearly a century and because of its virgin richness little attention has been paid to its refertilization, and so it has become much worn. For years it has been the corn belt's choicest corn land, and so corn, corn, and corn, has been grown upon it for several generations, and much of it is now fairly in the worn-soil class. A few years ago the author rented two hundred acres of this land and grew upon it peas and sugar corn for his canning factory. In the fall of 1911 he planted a large field of this land to rye, sowing the rye in the sweet corn that he grew upon this land. No pasturing was permitted and in the spring of 1912 the rye and corn stalks were plowed under, the plows being set to plow nine inches in depth. Some of the rye had headed out before it was plowed under. After plowing the soil it was properly worked down and the whole planted to sweet corn, and a fine crop was grown upon it. In the spring of 1913 this same land was broken up and planted to field corn by the owner. The author did not see this field during the season of 1913 until about October 1st, when he took a view of the prairie from the crest of the hills. Nearly the entire prairie was planted to field corn, and remember that the character of all its soil was the same. As the author viewed

this sea of waving corn a pleasing sight greeted his eyes. The corn upon this particular field stood out prominently above its kind, like the sturdy, tall, broad shouldered man, in a crowd of men. It was easy to see that it had been furnished a fertility from the soil that its neighbor corn growing on the same kind of soil had not received, that had sent up its vigorous body above its fellows, and when the husbandman gathered its produce it produced far in excess of any corn growing upon this prairie. This corn had gotten the food that made it produce so strikingly and well from the organic matter put into this soil by a rye crop.

If we who are engaged in the business of farming could only be impressed with the truth that a worn or worn-out soil is a hungry soil; that a hungry soil like a hungry man or a hungry beast can not do normal work or give the best service to its owner, we would feed our soils the food that would enable them to bear the burden of crop growing and the food we would feed them would be the food nature designed for them—organic matter.

In feeding our soils organic matter let us not forget that the plowing under of the following green crops equals tons of barnyard manure to the acre as follows:

Vetch, about forty tons. Rye, twenty tons. Alfalfa, thirty tons. Clover, Cow Peas, Soy Beans, and Canada Field Peas, about twenty tons, thus making it easy for the farmer to get cheaply an abundance of organic matter for his soils, and thereby push up his soil to a wonderful fertility.

CHAPTER V

THE PROFITS OF THE BUSINESS OF FARMING

AS a general proposition, does farming pay? There can be but one answer to this question and that is "Yes." He who answers "No" overlooks the farmer's living. The vast majority of mercantile and other businesses do not pay more than a living to their owners, and the same is true of the business of farming. But a business that does not pay more than a living is not to be despised or looked upon with disfavor.

We have said that much is to be learned and much comfort is to be obtained by comparisons. When you are in distress think of your neighbor who is in greater distress. If your business is not paying what it should, think of your competitor who has been thrown into bankruptcy. A business that pays a living to its owner can be made to pay a surplus. No immense fortunes were ever made out of the business of farming, yet a vast number of moderate fortunes have been won from the soil, and we should not forget that the net income of the average farmer is greater than the net income of the average city man. A business, therefore, that will yield a greater average income to those engaged in it than any other business, is to be coveted.

The struggle for existence by a large portion



A LESSON IN PICTURES.

Which is the most profitable to grow?

of our city people under present conditions in our cities and towns is a human tragedy, and life's pathway is strewn with its victims. You do not find this condition on our farms. The farmers of our land are not subject to the incessant toil and grind that is the lot of so many city men and women.

So the business of farming is not retrograding if the majority of our farms are not paying their owners more than a living, for by better methods of farming, they can be made to produce a nice surplus. If the average farm is not paying a living the fault is with the owner and not with the farm. Of course the owner may be handicapped by lack of capital and other disadvantages, but the living and the profit is in the farm and can be brought forth by proper effort. To get the best out of any business we must devote ourselves assiduously to its every detail with an enthusiasm akin to infatuation.

By conducting the business of farming along proper lines the incomes of our farms can be more than doubled.

The average number of bushels of corn grown upon our farms does not exceed thirty. Sixty to one hundred can be as easily grown. The same possibilities for the production of other farm crops and produce also obtains.

As we have said, no man ever made a success of any business if he was not so interested in it that he could look after its every detail with such enthusiasm that he would devote the very best work in him to it.

Those men and women who have accomplished

great achievement, not only planned, thought, and worked while others slept, but worked with greater vim, interest and direction when others worked. No man will ever make a success of the business of farming unless he is in love with its work. The listless, careless, uninterested, lazy farmer will always make a failure of the business.

But the interest of the farmer in his business must extend farther than the interest that makes him simply a slave to his work, or that interest that does not lead him out in thought, the thought that leads him into the mysteries or whys and wherefores of the soil, its construction, its bacterial life, and of plant growth, and the other things that enter into soil building and maintenance, and the producing and marketing of crops.

The great inventions and achievements of the past were not thought out and constructed and accomplished by the pleasure loving and pleasure seeking men, but by men who regarded life as an opportunity for the doing of things worth while; and in the doing of which they secured and enjoyed more pleasure than in the frivolities that never satisfy but only aggravate and make more acute the desire for pleasure.

The followers of the creed taught in the catchy phrase, "All work and no play makes of Jack a dull boy," forget that there is more danger in the play that lessens both manhood and womanhood, induces idleness with all its evils, than there is in plenty of work.

Work is not a task, but one of the choicest blessings ever bestowed upon man. The game of life without it would be listless, insipid and uninspir-

ing, and not worth the living. Nature, in her every department, teaches us the doctrine of work and its attendant pleasures and delights. Even the many-hued, sweet, scent-giving flowers that so delight our senses, the pleasing fruits of tree and field, and the joy of beautiful landscape and open sky are the products of the constant work of nature.

When we achieve, design, and fashion something from our work, we receive more pleasure from it than we would from any of the frivolous amusements of life, and besides, we are strengthened for the fighting of life's battles.

To make the business of farming successful the man behind the business must ever work with hands and brains, just as the man behind any business must do to make it successful.

When the farmer works constantly with both hands and brain, he does not become like a machine that grinds on each day at its same task, but he is constantly accomplishing things, and seeing the glorious transformation of nature ever taking place in the plant and animal life upon the farm and in the open sky. If interested in his task as he should be, the things that he assists in accomplishing with his hands and by the direction of his brain, will give the greater pleasure, besides making his business profitable.

There is pleasure as well as profit in the planning of a perfect system of drainage and its construction and effect upon soil, increasing crop growth, the proper plowing of the soil and a study and application of the best means, methods, and appliances for plowing, the study of how to pre-

pare the soil for the planting of seed, the selecting and study of the best means and appliances for planting the seed, planning and putting into execution the better methods of cultivation, studying plant growth and trying to fathom the mysteries of plant growth, and to ascertain why it is that two plants growing side by side in the same character of soil, kissed by the same sunshine and nourished by the same rains, the one will produce the food that satisfies and nourishes man, and the other, fruit that poisons and kills.

The study of the nitrogen gathering plants is one of the most wonderful and fascinating studies that can engage any mind—the plants that have the power to draw from the air the most costly and precious soil element, nitrogen, and store it into the soil for the use of growing plants, and thus renovate our worn and worn-out soils.

Too many farmers get into the monotonous grind that too many city men get into,—the grind that throws about us a state of indifference to the good and interesting things of our work; that will not allow us to see the greatness, the vastness, the inscrutable mysteries of Nature's ways. Oh! if we who are engaged in the business of farming would but catch the vision of the wonders lying at our very feet, what a transformation would result in our business, resulting in increased profits.

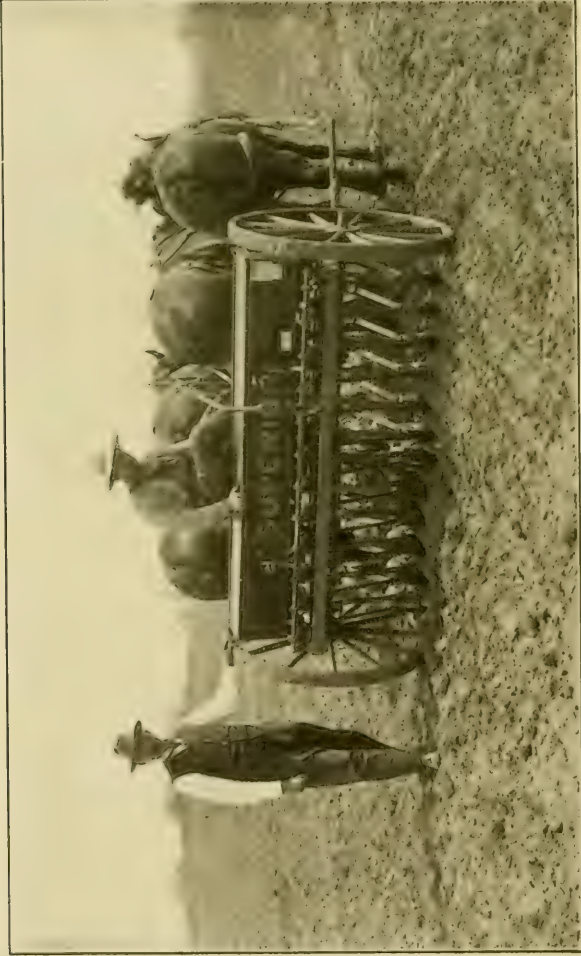
Mankind in general go about their daily tasks like the driven galley slave and so perform their work with like interest, sighing that the working hours are so long, rejoicing when they are ended,

and learn and enjoy nothing from their work. Work under such conditions is, of course, a seeming curse. But he who goes to his daily task with cheerful, hopeful, investigating spirit, who seeks for knowledge and can see the mystery of God in the common clay, the growing plants, and insect life, who works not only for the money that will provide him with the necessities of life, but for the pleasure that it brings, has caught the true vision of life and right living, and thrice happy is he, for he has found the secret of right and profitable living.

The man with a vision plants a fruit tree, and there is pictured upon the canvas of his mind the full grown, developed tree, laden with the fruit of its kind, painted and flavored with the richest colors and most delicious extracts, but he knows that before that picture can become a reality, his hand must give that tree a fertile soil, the best cultivation, a scientific trimming and spraying for years. But Nature thus assisted, does her part, and the tree, as the years go by, develops and in time produces its perfect fruit and rewards the labor of the tender. But the tender took the greatest delight in his work, knowing that the time would come when his labor would bear its reward. His work was a work worth while, and the community in which he lived was made better by his work, for, he who does nothing more than plant a tree by the wayside and tends it to maturity, has done more for mankind than he who sits and dreams and talks great things of accomplishment, but does not a thing to bring them about; or even

he who ever works at his task with stolid indifference to its importance or unmindful of its pleasures.

If the farmer gets the true vision of farming and sets out to make it a reality, he will surely find the business of farming a most profitable one. He will whip the loafing acres of his farm into work that will make them produce a hundred fold. The best breeds of stock will be found upon his farm. He will install labor-saving and pleasure-giving appliances. Farm surroundings will be made attractive, and he will experience the true joy of living. The delights of fertile fields with their burden of profitable produce will be his, prosperity will abound, and though he may not accumulate the large fortune, yet his business will give him the profit that gives comfort, happiness and necessary ease, with the proper environments for the right living and growth of himself and family, and the business that does this is, after all that can be said, the best and most profitable one in which any man can engage.



A PIECE OF GOOD FARM MACHINERY SOWING GOOD SEED UPON
GOOD GROUND.

CHAPTER VI

EQUIPMENTS NECESSARY FOR CARRYING ON THE BUSINESS OF FARMING

TO engage in the manufacturing business it is essential that one has a plant or building equipped with the necessary machinery, and possessed of the raw materials, so that the products of the manufacturing concern can be prepared for market, and the buildings and machinery must be such that can work up the raw material so that the owner can prepare and put on the market a good product at a reasonable price and yet make a profit.

The farm is the farmer's manufacturing plant. His chief raw material is the soil. His machinery is his live stock and farm machinery necessary to run his plant. He and his hired men are the workmen who work up the raw material into crops and the other products of his plant.

The farm is as much of a manufacturing plant as a steel or iron works, and to yield its owner a profit, must be managed and worked under a business system as complete in its detail and perfection as any by which our most successful manufacturing plants are managed and operated. But a manufacturing plant, to be successful, must be located favorably as to markets and of easy access to raw materials. A plate-glass factory in the

Sahara Desert, while accessible to good polishing sands, and sands from which good glass might perhaps be made, yet it would be so remote from markets for the finished product, and for the securing of other materials that go into the manufacture of plate-glass, that it would be a miserable failure.

Not every farm is favorably situated as to markets for all the products that can be produced upon the farm. A farm far removed from a railroad or consuming center might produce the finest fruit and vegetables that can be grown, but what profit would there be in growing such if there be not an accessible market?

The successful farmer considers these things and so produces those products upon his farm that can be disposed of to advantage or profit. The staple crops of corn, wheat, oats and live stock, can be marketed from most any farm, no matter where located, yet in the marketing of these products a greater profit is secured if the farm be in easy access to the market.

We who already own our farms must make the best of our situations and grow such crops, or produce such farm products as we can market to the best advantage and profit, and which will grow, or can be produced upon our soils. Of course we should grow the crops that fit the soil, yet it is wonderful how many different crops will fit upon most any soil. If we are in the market for a farm, then we should determine the kind of farming in which we wish to engage, and buy the farm that will not only produce them, but from which they can be marketed to the best ad-

vantage and profit. Assuming that we own our farms, how are we to make them successful, and what equipments are necessary to that end?

The very foundation and the success of the business of farming is based upon the soil. It is the raw material from which farm products are to be fashioned. If the soil be unproductive, shorn of its fertility, then we only produce the limited amounts of farm products that scarcely, and in many instances, do not pay the cost of production, and so the business of farming such soils becomes a failure.

And if our soils even be so fertile that they will produce products that pay a profit, yet if we farm such soils for a series of years without a thought or action towards doing those things that maintain soil fertility, we will soon pass them into the class that does not pay a profit. Therefore, that thing which is essential to the success of the business of farming should receive our most careful consideration, and yet we have shown how it has been neglected in the past. When our soils were new, or at the time they were first submitted to the task of growing crops, they were so rich in fertility, and free from weed and insect pest, that they would grow bumper crops with little effort on the part of the husbandman. The pioneer could plant his corn in a shallow plowed soil between the stumps of his newly cleared ground, or in the few inches of upturned prairie sod, give it a little cultivation, and be assured of an enormous crop. Such a system of planting and cultivation in our soils that have been in cultivation for a half century or more, would mean utter crop failure.

Nearly forty years ago the author assisted in clearing a heavy growth of timber from parts of rich Indiana timber soil. It was a hard, laborious task to fit it for the plow the first time, and not only hard and laborious, but a trying, exasperating task, to plow the small area of soil not occupied by the tree stumps and roots, which almost occupied the entire soil, but it was only necessary to sufficiently scratch the soil to cover the seed. However, the plowing of the soil under these conditions was attended with such discomforts and exasperating difficulties, as would cause a young man engaged in the task to dream of a city life and to abandon the farm.

In the course of time the stumps and the roots decayed and were removed and the soil was subjected to years of crop growing with little heed being paid to soil fertilization or the maintenance of soil fertility, and so it took less than a generation to put them into the worn soil class.

A short time ago it was the author's privilege to tramp over the fields he had helped to clear of their forest growth nearly a half century ago, and to him it was a pathetic sight to behold their wasted fertility, as evidenced by their stunted crop growth. If these soils had been farmed under the business system that obtains in our most successful manufacturing plants and business houses, their fertility would have been kept up and they would to-day be as rich in plant food elements as when first rescued from the wilderness of timber growth.

That farm products can be produced at a profit,

and at the same time the soil fertility be maintained and even increased, is an established fact, and is no longer open to serious discussion, but it can not be done by the old methods of farming which have been mostly in vogue in this land of ours, and by which our soils have become worn and worn-out.

The fact that when our soils were new and were covered with the wilderness of timber and prairie growth, it required brawn rather than brains to subdue them and bring them into cultivation, and the further fact that the simple covering of seed produced large crops without intensive cultivation, has led to an environment upon the farm by which the study of the needs of the soil was neglected; for, as shown, the soil seemed to be able for several generations to produce the crops that pay the profit without anything being done to feed it, that fertility might be maintained and increased; but in process of time the fertility of the soil was farmed out, and we have already shown that the farmers of our country, when they were brought face to face with this condition, simply moved on and preëmpted new lands and subdued them to the same process of cultivation and soil exhaustion. But now, when nearly all our virgin soil has been preëmpted, we are compelled to do the things that will restore fertility to our soils or perish.

If the farm is a manufacturing plant and the soil is the raw material out of which is shaped and fashioned the farm's finished products, it is therefore evident that the soil must be at its best

or farm products of market value, and in abundance, cannot be manufactured or produced from it.

He who owns this manufacturing plant, the farm, must have a good working soil rich in the elements capable of producing crops in abundance and at a price that will make this manufacturing plant pay dividends. The soil thus becomes the farmer's chief consideration and concern. If the farmer is wise and has a business head, he will see to it that his soil fertility is not only conserved, but is increased. When the farmer realizes that the fertility of this soil is the basis of his prosperity, his happiness, his existence, then he becomes a true disciple of the business of farming, not impregnated with that greed and avarice that plunders and robs the soil, but imbued with the spirit that recognizes that soil is a living thing and must be fed and groomed as we feed and groom our beloved domestic animals.

Had not greed and avarice taken possession of the farmer of the past, agriculture would have never known such a thing as worn and worn-out soil or the abandoned farm. The killing of the fabled goose that laid the golden egg in order to find the mass of gold supposed to be hidden in the goose, and secure it all at once, has had its exemplification in the constant pushing of the soil's production to the limit of its power, year after year, for a half century or more, without a thought of conservation or feeding so as to maintain or increase its power to produce crops.

The soil, then, being the very foundation and the chief asset of the business of farming, it should

be treated so as to make it produce the products in quantity that make the business of farming a manufacturing concern that pays dividends.

We have said that some of the essentials of the successful manufacturing plant are the buildings and the proper machinery and equipments to manufacture the finished products, but these are useless unless the raw material that goes into the structure of the finished product is available and at a price which, plus the expense of the manufacturing, will afford a profit. There is yet another item, without which the foregoing will be useless, and that is the element of labor, the skilled and unskilled workmen that constitute the force or the life and energy that moves the mechanism of the entire plant and pushes to completion the finished product.

In the business of farming, the home, the barn, out-buildings and open sky are the buildings; the plows, the harness, and other farm implements are the machinery of the farming plant; and the seed and grains for planting, the live stock and the soil, are the raw materials to be worked up into the finished products of the farm. All the essentials of the manufacturing plant mentioned are necessary for the production of the finished product, a lack of any prevents production. A poor quality of either machinery, appliances, labor, or raw material, means a poor or shoddily finished product. And the same is true of the business of farming.

The buildings must be sufficient to house the working man and the live stock; the soil must be of the quality that will produce its maximum; the

seeds and grain that will germinate with vitality and produce the best of their kind; and the live stock that have health, pedigree, breeding, that measure up to the perfection of their kind. But after all, there is a genius or guiding hand back of the manufacturing plant that was responsible for its conception, its being, its growth, and its continuing prosperity. So must there be a genius or the guiding hand behind the business of farming, which is the hand that conserves the fertility and governs the destiny of every part and portion of the farm.

In most manufacturing plants, exact costs and profits can be figured, but not so with the business of farming, for we cannot control the conditions that will give us the proper rain and sunshine to germinate the seed and produce the crops, nor can we know the extent of the horde of insects and other pests that may sweep down upon our farms, the combating of which adds largely to the cost of production, and oftentimes cannot be combated, which results in either a partial or total destruction of our crops.

Neither can standardization be put into effect upon the farm as it is in the factory. While the business has as many of the uncertainties as any other business, yet scientific farming is fast eliminating many of these uncertainties. The effect of drought is being overcome. The breeding of seeds and animals is to a great extent making standards of grain and stock, so that when we plant seeds of a certain kind, or breed our stock to certain breeds, we may depend upon nature reproducing in kind.

To him who already owns his farm, no good purpose can be subserved by entering into any scientific discussion of the formation and composition of soils. All that he who is engaged in the business of farming needs to know about the foundation or composition of soils, is that one class is composed of an abundance of small rock particles in which are locked up the soil minerals accompanied with little vegetable or organic matter, known as our sandy soils; another class has an abundance of decomposed rocks containing aluminous minerals, known as our clay soils, and another has the abundance of vegetable or organic matter known as our muck soils.

Air, sunlight and water, entering into and coming in contact with these soils produce the condition essential to plant growth. That some of these soils do not produce an abundant crop growth, is due to the lack of some essential plant food element which must be supplied.

If farmers would become Nature students and would study her ways and her doings, they would make a greater success of the business of farming, for if they would do this, they would learn the simple lesson that when Nature fashioned the soil she first took the rock particles of the soil, started the vegetable growth into them, which not only dissolved the mineral elements locked up in the rock of the soil, but filled it with vegetable and organic matter, all of which is the food upon which plants feed, and are the means of letting air into the soil that plants may perform the necessary function of breathing.

Plenty of air, moisture, sunlight, mineral and

organic matter make the fertile soil, and produce the condition essential to healthy, abundant plant growth. If this be true, then to make our soils fertile and put them upon a profitable basis for the successful conduct of the business of farming, is to learn to do the things that will bring about these conditions.

God furnishes us with plenty of air and sunshine, and we need not give ourselves any concern about these elements, except to ascertain how to get the air into the soil. Sunlight coming into contact with the soil produces the warmth necessary to wake up and bring into action the sleeping life of the seed. Getting the air into the soil is the simple process of ditching the soil and filling it with organic matter; both these things let into the soil an abundance of air if done in the proper manner.

We must know our soils. This knowledge is the very foundation of the success of the business of farming. Hosts of farmers in numbers as the sands of the sea have spent their lives upon the soils of Mother Earth, and even in their last days were as ignorant of the needs and possibilities of their soils, and the correct methods of handling them, as little children. To prove this statement we have but to point to the world's worn, worn-out and abandoned farms which have chiefly been owned by this class of men.

The injunction has come ringing down through the ages, "Man, know thyself." If then the soil is the very foundation of man's existence here on earth, it is as equally important that men should know their soils, that they may ascertain

their wants and their needs and learn how to make them produce the paying crops.

So to carry on successfully the business of farming, the equipment of a good fertile soil is the first requisite. There is no substitute for it. And not only you who are about to engage in the business, but you who are already in the business, must get this fact so imbedded in your minds that the study of the soil and the best methods of maintaining and increasing its fertility, becomes with you a "ruling passion," for there is no other way to make a success of the business of farming upon our farm lands that have been subjected to cultivation for twenty-five or more years.

The next necessary equipments to secure success in the business of farming are, as already stated, sufficient buildings to properly house your family and your stock, the very best modern labor-saving farm implements and machinery, plenty of draft giving horses and mules, or other power for moving implements and machinery, sufficient money making breeds of stock, and sufficient money to finance farming operations.

But after all, is it not the "man behind the gun" that counts in any battle? The government furnishes the equipment for warfare, the generals plan the lines of attack and start the battle, but the success of the battle depends largely upon the "man behind the gun." If he fails in his duty, either from want of attention, action, or competency, defeat and rout results. In the business of farming old Mother Nature, human skill and invention furnish the chief equipment for carrying on the business, the

knowledge furnished by educational processes and experience is the general that directs the line of action or attack, but the man behind the plow is responsible for the success of the business. If he fails in his duty for want of attention, action or competency, defeat and rout results.

While no elaborate equipment is necessary for the successful carrying on of the business of farming, yet the equipment must be sufficient to secure even moderate success. There are many men behind the plow who hammer out success with limited equipment, and these are the men we should strive to emulate, for they give hope to the poorly equipped farmer and the more inspiration to those who are well equipped for the business.

In this chapter little has been said about the capital or money requisite to carry on the business of farming, and the reason for this omission, for it is one of the important equipments necessary for carrying on the business, is that we have reserved it for special discussion in the chapter pertaining to farm credits.



TRACTOR PLOWING DEMONSTRATION FOR BENEFIT OF AGRICULTURAL
CLASS OF DELPHI, INDIANA, HIGH SCHOOL.

CHAPTER VII

NECESSARY PREPARATION FOR THE BUSINESS OF FARMING

ACCORDING to government investigations forty per cent. of the farmers of the country believe that the business of farming can only be learned by personal experience, and they take no stock in farmers' institutes, demonstration agents, farm papers or Department of Agriculture publication as aids in the business of farming.

We have ever been taught from our youth that experience is the best teacher, but we forget that experience "is the extract of suffering," that it is the name given to our follies. The chief trouble with most of us is we will not learn from the suffering of another, we must suffer ourselves. Experience is of no value unless it is made to illuminate the path we are yet to tread. We who say we can learn only from our own experiences, should remember the words of Benjamin Franklin who said that "Experience is a dear school but fools will learn in no other way and scarce in that."

There has been such a changed condition in the character of our soils and the methods of farming necessary to bring success that it is the height of folly to try to conduct much of the business of

farming on our experience of even ten years ago. He is the wise man who not only gains wisdom from his own experience, but also from the experience of others. Experience at its best is a mighty slow and expensive teacher, and we are staking too much when we depend for our learning and conduct upon it. It has been aptly said that "by experience we find out a short way by long wandering." But it was also well said that "learning teacheth more in one year than experience in twenty."

He is the wise farmer who considers the results of his own experience with the results of the experiences of others and is able to gather from the whole, methods of safe conduct for his farm operations. It is as true to-day that there is safety in a multitude of counselors, as it was when the words were uttered by Solomon, the wisest of men. Supposing a man wishing to be a lawyer or a physician would say "Away with the experience and teaching of those lawyers and doctors who have recorded their knowledge of their professions in the volumes they have written, I will none of them. I will learn how to successfully practice these great professions by my personal experience alone." How far along the roads of these professions would he travel? He would fall by the wayside ere he started. The man to be successful in these professions must first become a student and spend years of hard, weary, discouraging labor in the study of the experiences of the great lights of the profession as recorded in the imperishable volumes they have written for the great benefit of mankind.

When he has mastered these he is ready to add to his knowledge the knowledge gained by his own experience. He is then duly qualified to work and successfully garner in the fields of law and medicine.

The same is as true of the business of farming. The farmer of the past scorned the study of farming as taught by book, history, chemistry or any scientific method. He had at his command a soil rich in all the elements of fertility for nature had made it so, and it came into his possession in its virgin richness. He had but to plant the seed and give the growing plants but little cultivation, and they produced a burden of crops, and unfortunately for the business of farming, this process could be and was continued for a generation or more—at least long enough to imbue the farmer of the past with the false notion that any one could farm, and that no scientific knowledge was required upon the part of the farmer. It was this very state of affairs that has led to the plunder and exhaustion of our soils, that has made the abandoned, worn and worn-out farm a part of our farm economics.

But the day of reckoning has come. We of this generation are reaping the follies perpetrated by our pioneer farmers. We find the fertility of our soils waning or already exhausted. We are confronted by "a condition and not a theory." To continue in the way our father farmers cultivated their farms means death and decay just as certain as death and decay is written on every living thing.

We must admit that we are facing a serious

agricultural condition and not a theory. Any one with observing eye can see it. In every part and portion of our country we stand in the midst of worn and worn-out soils—soils that no longer produce paying crops. The abandoned farm is a part of our agricultural economy, and these worn-out abandoned soils are not safe investments if farmed by the same methods that made them worn and worn-out, and which led to their abandonment.

We have said that if our worn soils were but possessed of tongues, their treatment by which they have become worn-out, has been enough to unloosen them and make them speak with indignation. But although these soils are without the power of speech, they have by actions that speak louder than fiery words, shown their resentment and wrathful feelings. They have expressed their indignation by stunted crop growth, the eroding away by washing rains and blowing winds and refusing to grow crops that pay the cost of production. And yet some of these speechless, indignant soils are by their owners fed with food that does not satisfy, but only intensifies and makes more acute their present condition. And their condition is further aggravated by being cultivated under the mistaken notion promulgated by our government, that their fertility has not been exhausted.

Business is nothing more than being industriously engaged in the affairs of some occupation from which we derive our support.

Generally we select our business in early life and more or less attempt to qualify ourselves for

it. Our selection of a business is governed by circumstances, desires, direction, talent, or birth. Many of us are born into a business. The majority of men engaged in the business of farming were born into it. A few take it up from desire, direction or talent. And this has been true in every age, and accounts for the fact that in the past there has been so little preparation for the carrying on of the business upon the part of those who have been engaged in it. The farmer boy born upon the farm, who did not catch a vision of the business of city life, simply drifted into the footsteps of his father who likewise had drifted into the business of farming, and learned from him the lesson of the business. The education that he secured from the schools he attended was not along the line of farming, for the training for the business of farming has had no place in the curriculum of the schools of the past, and too often the education he secured from the common schools was scarcely enough for the simple transactions of life. If, in getting his education, he caught no other vision of business life, he stayed upon the farm and learned its lessons from the school of "the way father did it." If father's way was the right way, and sad to say, generally it was not, he became as proficient as father, and if it was his lot to farm rich virgin soil, or soil that had not lost its fertility, he made a success from a viewpoint of dollars and cents.

But the environment of the father became the environment of the son, and if the father had the broad vision of the business of farming, the son caught it also. Farm practices were transmitted

from father to son, and if they were bad, and unfortunately for the business of farming many of them were, the business suffered.

It is said that in the business world the spirit of the times is scientific efficiency. The well managed manufacturing plant installs that machinery and eliminates that cost of labor and materials which not only increases efficiency but lowers the cost of the finished product, and then makes all of those methods of transportation and marketing that will enable the manufactured product to afford a profit.

Scientific efficiency must become the paramount thing in the business of farming. Therefore, the old notion that any body can farm, must be discarded and thrown upon the scrap heap of "impractical ideas." Farming is a business requiring as much brains and skill to successfully conduct it as it does to successfully conduct any other business or profession.

We have now reached that age in our agricultural history when our country no longer feeds Europe, no, not even itself. For in the year 1912, with its boasted four billion of a crop yield, pointed to by our National Agricultural Department with such swelling pride, less than five per cent. of our total exports consisted of foodstuffs in crude conditions and food animals.

We have imported a dollar and fifteen cents worth of food for every dollar's worth we have exported, whether in a crude or manufactured state. Fifteen years ago two-thirds of our exports were agricultural products. And in the year 1912 but one State east of the Mississippi River



HOW SHALL WE EDUCATE HER?

Shall we educate her along the line of Farm Domestic Science, that she may become the helpful wife of the "Farmer of Tomorrow"? Or shall we give her the insipid education that will unfit her for the serious and better duties of life, and drive her from the farm?

produced enough wheat for its bread, and Ohio, Indiana, Illinois, Michigan, Missouri and Iowa had to import wheat for their bread. For a period of four years Iowa had grown less wheat than her people have eaten. And yet we boast of agricultural greatness.

This then is an opportune time for us engaged in the business of farming to take an inventory to ascertain what preparations are necessary for the proper conduct of our business and also ask ourselves are we profitably conserving our raw material? Are we profitably utilizing our by-products and converting them into use and wealth? In fine, are we getting the very best out of our business? Does our business pay? If it does not do these things, can we bring about the achievement of these ends and how?

The author is sure that they cannot be brought about by the old practices of farming which have been the sole responsibility for our worn and worn-out and abandoned soils. There must be better preparation upon the part of those engaged in, or who are about to engage in, the business of farming.

Those who are already harnessed up to the business of farming must see the vision of better farming. They must lay aside the prejudices and environments that have been handed down and thrown around them by their fathers, remembering that their fathers, perhaps, meant well, because they had rich virgin soil at their disposal and did not see the needs of soil conservation, and enrichment as we now see it.

While those who are engaged in the business

of farming can not go and take the courses of our agricultural colleges, yet the opportunities for learning better farming are now brought to their very doors by the literature of our agricultural experiment stations, farm journals, and the best agricultural books written by practical men who have lived close to the soil studying its whims and its needs, and who give a "well digested system of an experienced and successful farmer who has seen and practised all that he records."

The experiences of men who are doing things in the business of farming, showing its mistakes of the past and its possibilities, are being recorded every day and for little money can be secured by every one engaged in the business of farming. And they can indeed be made to illuminate the path we are yet to tread.

The young men and women who are thinking of making the business of farming their life work, have such opportunities for learning and mastering the business never possessed by the young men and women of a generation ago. The young men and women of the past were educated away from the farm. The curriculum of the schools did not even hint at agricultural education. The ideals of the professions and city business were held up before them as the right ones to be obtained and they caught no visions of the business of farming.

We have seen our educational mistakes and are fast correcting them. Our schools and colleges are giving agricultural training and education a prominent place in their curricula.

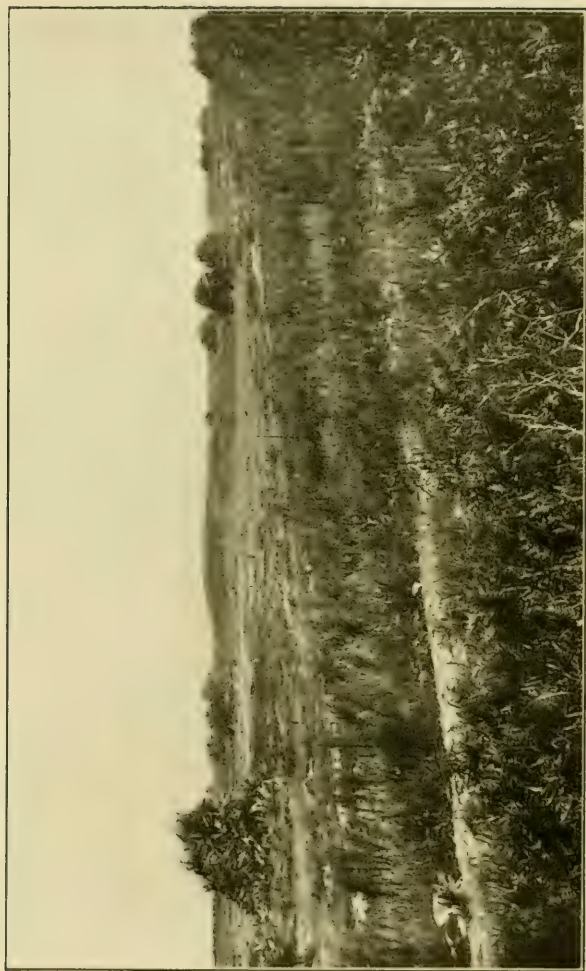
The general government and each state govern-

ment and corporations are appropriating large sums of money to carry on the mighty work of agricultural education, and if this work is continued with its present enthusiasm, the day is not far distant when the worn, worn-out and abandoned soils will be no longer our possessions, but simply matters of history.

Therefore, the conclusion of the whole matter of preparation for the business of farming is more education. The farmer of the future must be educated along the lines of scientific agriculture or the nation will perish, for no nation can live without a fertile soil. But education without practice availeth nothing. We have reached that period in our agricultural history where we must not only educate but we must think, plan and put into action.

In the matter of educating the men past the middle age engaged in the business of farming, we are met with the perplexing problem of stolid indifference to the benefits to be derived from agricultural education. The adage that "you can not teach an old dog new tricks" is strongly exemplified in this class of farmers. They learned processes and methods of farming under conditions that made these processes and methods fairly successful, for the soil was favorable to their adaptation. But now under changed soil conditions these men resent and will not adopt the processes and methods necessary for the successful cultivation of our soils as we now find them, simply because an environment has cast over these men the magic spell of prejudice and inaction. About all we can do with this class is to

exclaim, "Ephraim is joined to idols: let him alone." Our hope lies in "the farmer of tomorrow," our young men and women. While we can do much with the middle aged men and women engaged in the business of farming, our chief hope is with the young men and women, and they are already being intensely interested in this education, for thousands of them in all parts of our country are not only receiving this education, but are putting it into practice, and the results of this educating process are astounding, for in Indiana and other corn states, yields of corn have been increased from twenty to sixty, one hundred or more bushels to the acre, and even in Texas, not considered strictly in the corn belt, the average yield of corn per acre has been increased from sixteen bushels to fifty-one bushels, and their cotton crop has been increased from one-third of a bale to one and four-hundredths bales to the acre, all accomplished by these young men and women. Mighty, then, is agricultural education and training, and it must be set down as the main thing necessary in the preparation for the business of farming.



RESCUING SOILS FROM TIMBER GROWTH.

"Stumping" the "cut over" pine and hardwood lands of northern Michigan. Scene upon the "Nellie Whitney Fruit Farm" of James E. Merritt, near Manistee. The stumps are pulled and piled into immense stacks with a horse power stump puller and allowed to thoroughly dry out before burning.

CHAPTER VIII

PUTTING THE SOIL IN CONDITION FOR CARRYING ON THE BUSINESS OF FARMING

HAVING made the necessary preparation for carrying on the business of farming, and possessing the necessary equipment for the business, the next step is the putting of the soil in condition for the breaking plow. This means that the soil must be cleared and drained. In the timber belt the great majority of our soils have already been cleared of their timber growth and are under cultivation. The uncleared soils of America suitable for cultivation, while not of vast area, present the perplexing problems of clearing, for to remove from them the stumps and tree growth means the expenditure of brawn and money. In the Michigan and Wisconsin cut-over pine and hardwood districts, we have the pine stumps that never rot, which can only be successfully removed by the power of the stump puller. And the hardwood stumps and second growth of timber must mainly be removed by the same power, so the cost of clearing each acre of said lands for the plow is often as much as \$50.

It would be equally expensive to clear hardwood lands if the stumps were not generally allowed to rot out. In many sections of our country the soils are covered with the glacial drift of

rocks that require strength and money to remove. If any of these lands are swampy, the additional expense of drainage must be applied to them. In fine, both our new timber and prairie lands must be drained before they are fit for cultivation.

Our soils which have been subjected to cultivation for a period of years, if care has not been used to keep them filled with organic matter, become compact, and so are not sufficiently ventilated for the successful growing of crops in them. It is necessary that these soils be ditched so that ventilation for the soil be secured. It is now a settled fact that plant roots breathe; that free oxygen must reach them or the plants perish. Oxygen must freely reach the seed in the soil or we do not get the healthy growth. Soil ventilation produces the necessary nitrates in the soil and prevents also their destruction.

The soil must be properly ventilated that soil bacteria may live and perform their function of changing the nitrogen of decaying organic matter into a form suitable for plant food. Drainage is one of the chief aids to accomplish this end. Drainage conserves moisture, promotes soil ventilation and gives soil the proper temperature.

In the restoration of worn and worn-out soils drainage in one of the main remedies that must be employed. And here at this point it is well for a brief period to wait upon the soil doctor and get his ideas of putting the soil in condition for the carrying on of the business of farming.

When our bodies become diseased we call the physician who, in our judgment, "has rare skill in diagnostics," who by critical perception and

scrutiny discovers signs and symptoms upon which he bases his judgment as to the disease that has made us sick, and the remedy to be applied.

The same principle must be applied to the diagnosis of our soils which have lost their crop producing power, to ascertain the nature and extent of its ills and the remedy to be applied.

The skilled physician knows the very structure of the human body and the tissues that make it up. He knows its origin, the conditions that enhance or retard its growth, and the food needed to sustain it. It would therefore seem that he who seeks to cure the diseases of our worn and worn-out soils must possess some skill as a "soil doctor"; that he should know the very origin of soil; that soil is that upper stratum of the earth's surface composed of substances which furnish food for plant growth; that soil was produced or made up by the wearing down or decay and dissolution of rocks, the washing of sand and decay of vegetable or organic matter; and he too must know the food it needs to make it fertile.

The writer does not believe that in order to become a "soil doctor" it is necessary that one should become skilled in the science of chemistry or other sciences. Rather he should become the student of Nature, sit at her feet and observe her ways.

While the study of the sciences may teach us that the three elements of potash, phosphorus and nitrogen are necessary to make fertile soils; that these elements are vitally necessary because they increase the quality, fruitfulness, early ma-

turity and growth of plants; that nitrogen is the "most precious, the most important and the most costly," and the element soonest farmed out of our soils, yet when we become nature students, use our brains, closely observe the structure of soils, we find that the new, rich organic soils just reclaimed from the wilderness of tree and plant growth are filled with decayed and decaying trees, underbrush, roots and grasses; that these substances decaying, become the organic matter of the soil upon which the soil bacteria feed, and these substances decayed, or what is left of them after the decaying process, become the humus of the soil, thus making up and constituting two soil elements so necessary to make it fertile and bear its burden of crops.

The nature student when called upon to act in the capacity of "soil doctor" and to diagnose sick soils—soils that no longer produce paying crops, like the skilled physician, quickly perceives that these sick, worn, and worn-out soils, have become sick because their supplies of organic matter, humus and nitrogen, have been consumed. He discovers that while they may possess in available form the mineral elements necessary for the proper working of their functions, yet they lack the elements of organic matter, humus and nitrogen in sufficient quantities so that they will become a favorable home for soil bacteria who compound plant food so that plants may not only grow, and bear their burden of crops, but will also release and make available these mineral elements in the soil to furnish food for future plant growth.

After all that can be said "soil doctoring" is but the application of simple common sense. We must use our "thinkers" and faculties of observation. When we do this we will catch on to Nature's ways of soil building and soil restoration, and, imitating her, we will not only maintain soil fertility, but will restore our bleak, barren soils, made so by sordid tillage. Acting then along this line, he who runs must read in Nature's Book the living truth that when Nature built the original soil she used a lavish supply of organic matter in its construction. She took the rock particles of the soil which contained the mineral elements of phosphorus, potassium, magnesium, calcium, iron, etc., and by the growth of certain plants, grasses and trees in the soil, she put these mineral elements to work, and they became mixed with the roots, bodies, limbs, leaves and stems of these plants, grasses, and trees, which form the organic matter of the soil, which held moisture and gave the soil its necessary ventilation. Then Nature created the soil bacteria, the mighty little chemical workers of the soil, who, attacking this organic matter, broke it down and in their laboratories worked it up into not only plant food, but into the humus of the soil which acts as a water reservoir for plants, improves the physical condition of the soil and regulates soil temperature.

Nature's processes of soil building are so simple and yet complicated in this, that while we can not fathom the mystery of plant growth by which two plants growing side by side in the same character of soil, kissed by the same sunshine and

nourished by the same rains, the one plant will seem to poison the soil and rob it of its fertility, and the other plant, while taking from the soil all the elements it needs for fruitful growth, gives back to the soil more fertility than it consumes, yet we can if we will, observe the phenomena of plant life and growth, and grow as much as possible of those plants that build up the soil.

Nature, having built the original soil by a lavish use of organic matter, man, when he brought it into cultivation began to grow upon it those crops for gain, which, as we have said, never give to the soil any fertility in compensation for the food they take from the soil to build them up and ripen their harvest of fruit or grain. The soil being new and fertile the harvest of these crops was large, the husbandman waxed fat from their sale, the avarice of greed became a passion, so year by year the husbandman continued the growing of these crops so that the soil was slowly but surely mined of its fertility, but it resented its treatment, inflicted the awful punishment of withdrawing its bounty and became the sick worn-out soil found not only on the abandoned farm, but in all parts of our Union.

So when the "soil doctor" was called upon to the diagnosis of this worn soil, to fathom its ills and prescribe a course of treatment, he found it stripped of its organic matter and humus. It was cold, compact, without capacity for ventilation. Soil bacteria had abandoned it because it furnished no food for their maintenance, nor favorable environment for their existence. He found it but a soil skeleton stripped of its flesh,

that could not grow the common growth of weeds, let alone the "foodful ear."

The first step towards the restoration of these conditions to the soil is to ventilate the soil, for plant roots must breathe to live as well as man. Close, compact, non-porous soil without organic matter or humus is a dead soil. It becomes a house without ventilation in which no plant roots can properly breathe or secure the free oxygen necessary for the plant's growth and proper development.

This soil ventilation is secured first by drainage. The principle of drainage is that it opens up the pores of the soils so that water and air can percolate through them, and when soil pores are open for the free passage of air and water they become a home where plant roots may not only breathe, but strike deep and become safe from droughts as well as floods; where soil bacteria may live and work out their laboratory problems of compounding food for plants, and cleansing soil of its offensive accumulations. The "soil doctor" who does not prescribe a large dose of drainage for worn and worn-out soils will surely fail to cure his patient. For drainage is surely the "first and most important aid to the injured," in worn and worn-out soil treatment.

The dose of drainage having been properly administered, the next step in the course of treatment is the securing to the soil organic matter and humus. Applying these two elements to worn and worn-out soils, not only aids in securing soil ventilation, but absorbs vast quantities of water to be held and supplied to growing plants when

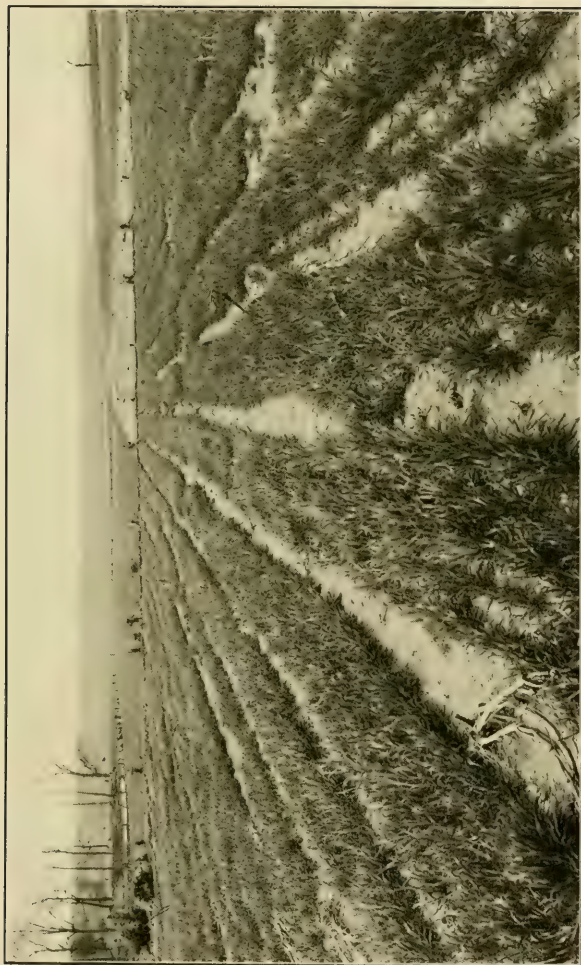
needed, furnishes the food for germ life and bacteria, the food for plant growth, and releases and makes available the minerals bound up in the rock particles of the soil.

Like the soil medicine of drainage, the medicine of organic matter and humus must be prescribed in big doses for sick, worn, and worn-out soils. It is the soil medicine that cannot in this age be given in over doses. True, Nature "overdosed" it in some instances, as in the case of muck soils where organic matter and humus were given to the soil for ages, and when no greedy farmer was near to consume these soil elements by the growing of those gainful crops which feed upon and consume them.

The next dose of "soil medicine" to be administered is "proper plowing of the soil." Like the ancient farmer, to-day many of the farmers of the old countries scratch the soil with a crooked stick and call it plowing. Even many of the farmers of our country with their new and most modern styles of plows scratch their soils three or four inches deep and encourage themselves with the thought that they are really plowing the soil.

Nature's plows are the roots of plants and trees, and with these plows she stirs and mixes the soil to a great depth, and more effectively than man with his most modern plows, and she never plows the soil in an improper condition.

The object to be secured in plowing is to so stir the soil in its right stage so that the organic matter and humus will be mixed with the rock particles of the soil that a deep seed bed be obtained, so that the storage capacity for water in the soil will be



THE IMPORTANCE OF A COVER CROP UPON SOILS SUBJECT TO WASHING.

The land shown in picture is subject to overflow. The cover crop shown is vetch and rye. High waters washed out the corn rows to a depth greater than the corn roots had penetrated. The cover crop prevented washing between corn rows.

increased, and the securing of a seed bed most favorable for the growth of plants; and such a seed bed is one that holds sufficient moisture, air and heat, that chemical and germ action will take place therein, that plant food be prepared for growing crops.

There are times when the doctor of human ills requires his patients to wrap themselves with quilts and comforts that all parts of their bodies may be protected from drafts that certain conditions may be obtained so that the medicine administered to the patient may be efficacious. It is the same with soil doctoring. Sick soils need to be covered with cover crops so that certain conditions necessary to soil maintenance and restoration be obtained. Nature is a lavish user of cover crops and is persistent in her efforts to cover naked soils by the growth of weeds, grasses and trees, thus teaching us a valuable lesson in soil covering.

A cover crop is one like grass, rye, clover, vetch, hungarian, buckwheat, or any close lying herbage and thickly rooted plant, whose mission is to prevent soil from washing, blowing away, puddling and cracking, and to prevent ammonia wastes by evaporation and the loss of nitrogen; and its further mission is to produce the mellow texture of the soil and to bring about all those conditions characteristic of new and virgin soils. Like the doses of drainage, organic matter, plowing, etc., the dose of cover crops must be large or the "soil doctor" will see but little improvement in his patient of sick soil.

The "soil doctor," while administering all the

doses mentioned, can greatly aid his patient in recovering its strength by administering ground rock phosphate and limestone, nitrate of soda, and potash, which, if given in right quantities, will so stimulate the soil that it will better assimilate the medicine of drainage, organic matter, plowing and soil covering.

The most important method of treatment and medicines to be administered have been given for the treatment of sick soils. And the use of this method of treatment and the application of these remedies is the true and only remedy for the disease of our soils. It is the only treatment and remedy for soil maintenance, and any other treatment and remedies which do not embody these are but the nostrums and patent medicine remedies of the quack soil doctor, the use of which will not only make the patient more ill and diseased, but will ultimately lead to his death.

When the soil patient has recovered and the tissues of its body have been rebuilt and its strength has come back so that it again takes up its burden of bearing crops, we must continue giving it the medicine of drainage, organic matter, plowing, etc., as a food, for the soil as well as man and beast must be fed, and to assist it in assimilating its food it must be groomed by proper cultivation, crop rotation, etc., for soil will resent mistreatment in these respects, as well as the mistreatment of withholding from it drainage, organic matter, etc. Soil will surely respond and give its best to him who feeds it, properly tends it, grows different crops upon it each year, and keeps stock

from tramping out its life in the fall, winter and spring seasons of the year.

It will not be amiss to say something about the method of applying these different soil medicines, and how they may be procured.

As to drainage there can hardly be too much of it, and it should be done even in the absence of water upon the soil, for we have shown that its object is not only to remove water but to get air into the soil.

Drains should be constructed of porous tile, preferably cement, not less than six inches in diameter, laid at a proper depth, and so constructed that both ends of drains will be open, and if of any length, manholes with iron open tops should be constructed near the center of the main ditch line, which will secure the quick passage of water, preventing the deposit of sediment in the tile that always occurs when water saturated with soil sediment slowly passes through tile. And drains constructed in this manner admit the free passage of air through them, and open up spaces or pores in the soil for passage of air and water, and thus perfect soil ventilation is secured.

The securing of a supply and application of organic matter and humus to worn soil is not so difficult as it may seem. It can be secured by conserving and plowing under of weeds that escape cultivation, cornstalks and application of barnyard manure. But supplies of these three are never secured in sufficient quantities on any soil to supply the need of organic matter and further and more adequate supplies must be obtained

elsewhere, but these can always be supplied in abundance on worn and worn-out soils by the growing of such green manuring crops as rye, vetch and sweet clover which are three plants that will grow abundant supplies of organic matter even on the poorest of soils, and when the supplies of organic matter which they produce are incorporated into the soil, the clovers and other green manuring crops can be freely grown.

Rye and vetch are truly the poor man's green manuring crops, because they can be planted and grown between seasons, that is, after the laying by of the corn, cotton or other crop, and will be ready to plow into the soil in the spring at planting time, thus preventing him the loss of a crop for gain, for he is in that condition where he cannot afford to miss for a single year the growing of a crop for profit or food.

Every tiller of the soil is a plowman and he plows that he may sow and reap an abundant harvest of crops, yet how few tillers of soil understand the true art of plowing so that abundant harvest of crops can be secured. The true art of plowing consists simply in plowing the soil when it is dry enough so that the plow in passing through the soil will not press together the soil grains under the plow and make a compact stratum of earth below the soil turned under which prevents the rising of moisture when needed by the growing plants, and so that a deep well turned seed bed can be secured.

When the weeds, cornstalks, barnyard manure, etc., are put upon the soil to remain untouched during the rest seasons of the year, and those

crops are planted in the fall that produce the heavy supplies of organic matter for the soil, we have then secured the soil covering, the importance of which has been shown.

The soil remedies herein detailed by the soil doctor for the treatment of worn and worn-out soils, the most vital disease of our nation, are safe and sure. They are not new and untried remedies or nostrums, they are Nature's remedies and have been known to agriculture for ages. By their use England restored her worn soils and made them increase their productive power nearly four-fold, and the agriculturalists of old Rome administered them to its soil at the time it was noted for its high state of agriculture.

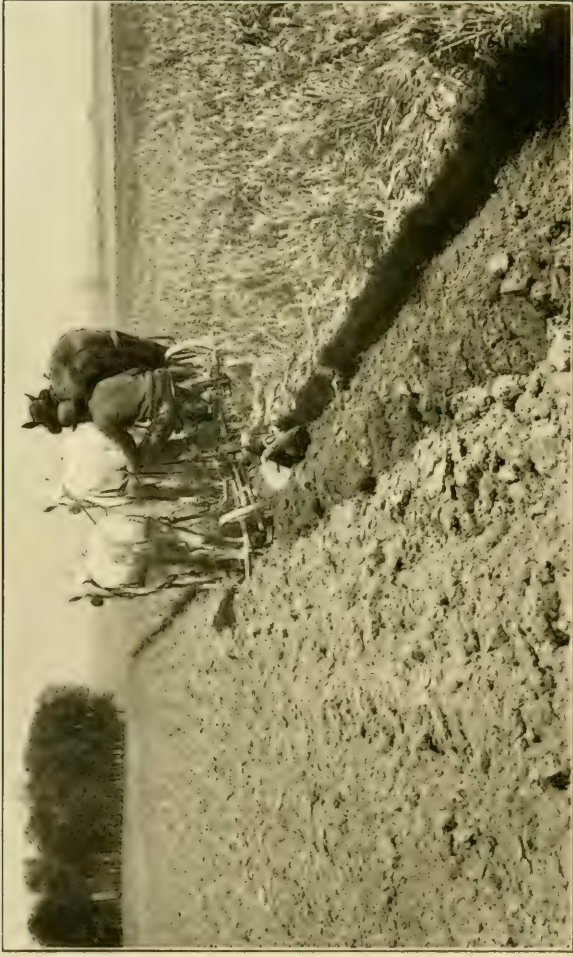
Germany for the past ten years by their use has made her potato crop average 200 bushels per acre, while the United States by their non-use has made but an average of 93 bushels to the acre.

In England and Scotland there are tenant farmers to-day who pay high rents for land, as much as \$20 per acre, feed the land like they do their bullocks, and the food we mention, even at a cost of more than \$100 per acre, and yet have made fortunes from their rented land, and one instance is given where one of those tenant farmers has made a fortune of a quarter of million dollars, lives in a fine mansion "with servants, beautifully kept lawns, parks and gardens, with all kinds of fruits and flowers, and a conservatory for growing hot house plants and fruits out of season."

And there are scores of other tenants in this land who are making money and enjoying all the comforts of life, who have learned the true art of

feeding the soil, that the soil, responsive as a human being when caressed by the hand of love, pours out its crop wealth into the hand that treats it well.

And there are men in our land who have also learned how to cure the diseases of our soils and the true art of feeding them, and the soil responsive of its good treatment is rewarding these men with bumper crops.



GOOD EQUIPMENTS FOR PLOWING.

Heavy draft horses, a skillful driver, a good sharp plow. Result, a perfect job of plowing.

CHAPTER IX

PLOWING

SOMETHING has already been said about plowing, but the subject should be further discussed as it is the most important adjunct to the business of farming.

A plow has been defined as a well known implement drawn by horses, mules, oxen or other power, for turning up the soil to prepare it for growing crops.

Tull, an agricultural writer of the long ago, said, "Writing and plowing are two different talents, and he that writes well must have spent in study that time which is necessary to be spent in the fields by him who will be master of the art of cultivating them. To write, then, effectively of plowing, one must not be qualified to write learnedly."

As the author does not deem himself qualified to write learnedly of plowing, he does believe, however, that he can write with some effect upon the art of plowing, for he first learned the art holding the plow handles of a walking plow upon the pioneer farm of his father, among the stumps of the newly cleared timber soils, and his fondest and sorest memories are of those youthful plowing days. Fondest, because they were the halcyon days of youth, the glorious springtime of our

lives; sorest, because in following the plow among the stumps of the "clearin'," the plow point would catch on the long elm roots, the ends of which would give away through the force of pulling horses, relieving the tension, as it were, allowing the roots to fly back and whack him over the shins, which not only led to a copious flow of tears, but also to a copious flow of language, not such, however, that is used by a pious, Methodist deacon, and which stimulated dreams of a city life.

In the author's day the breaking plow has evolved from the walking two-horse plow, to the riding single and gang plows and the modern tractor plows, pulling their three, six, eight, twelve or more, bottoms.

The ancient husbandman scratched his soil with a crooked stick, because he had or knew no better method of preparing his soil for growing crops. In the progress of time there was evolution in the art of building plows, just as there has been evolution in other things. We smile when we look at the pictures of plows used by our ancestors, and, no doubt, future generations will do the same thing when they look at the pictures of our most modern plows.

In the times of Nero, in parts of the world devoted to agriculture, it was a common sight to see a wretched ass and an old woman hitched to their crude plows, preparing the soil the best they could with such means for the seed bed, which was nothing more than a slight stirring of the soil. And even in this day there are countries in Europe in which plowing is done by the crude method of a straight piece of wood with an iron point to

which is attached a handle and device for hitching the power to move it. To this plow the husbandman hitches a mule or a buffalo which is led back and forth across the field by his wife, while he holds the plow into the ground the best he can.

We have already recited the incident of the early American colonists scratching their soils with crude plows, and because they could not plow to any depth with them, became imbued with the idea that deep plowing injured the soil.

We, the descendants of those colonists are surely victims of heredity, because this same false notion exists to-day and must have come to us by inheritance and is practiced by agriculturists to an extent alarming to him who has made any investigation of modern plowing.

For several years the author has made a careful investigation of plowing as practiced in the rich corn belt of Indiana, Illinois, and other States. He has taken measurements of the depth of plowing upon all kinds of soils, with all kinds and makes of modern plows, from the walking breaking plow, to the largest modern tractor, and his computation of the average depth of plowing has revealed the startling fact that plowing in the locality mentioned rarely exceeds an average depth of more than three and one-half inches.

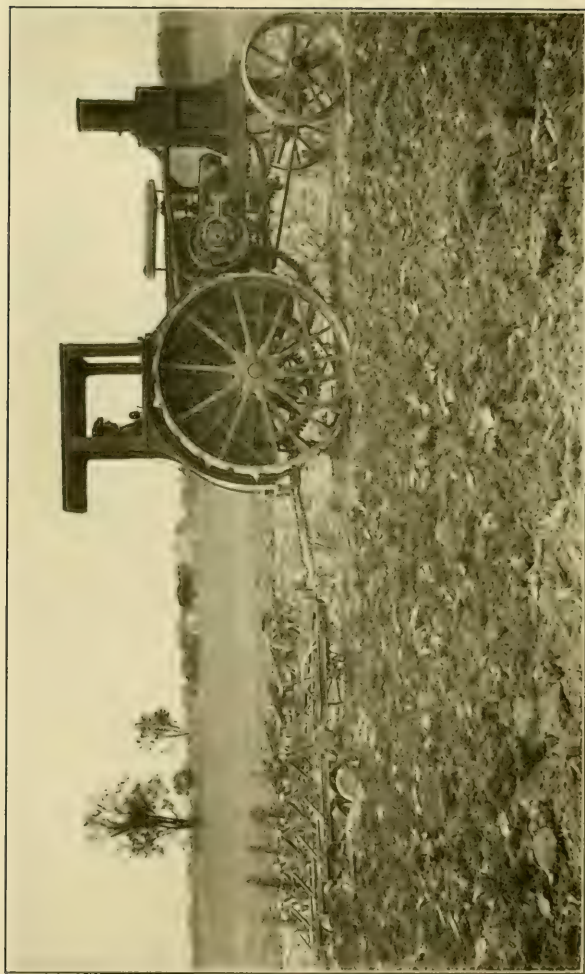
Investigating further as to the cause or reasons for such shallow plowing, he has come to the conclusion that the conditions that have led up to or caused so shallow a plowing of the soil have generally been an insufficiency of motive power, or power to pull the plows, and this insufficiency of power applies to every kind and make of plow,

whether moved by horse, steam or gasoline power.

Most farmers want to plow deeper, and many are deluded into believing that they are plowing deep enough, for they never measure with a rule the depth they are plowing, and to attempt to measure the depth of plowing with the eye is deceptive. It takes power to move any plow five or more inches in depth through our soils of today, for they are closer and more compact than they were when filled with organic matter.

Plowing for the seed bed is done mostly in the spring of the year, when horses have just passed through their period of winter rest and are unused to the hard work required for plowing. They are in that period which the farmer calls "soft." Their muscles are relaxed and need to be toughened, and instead of preparing the horse for this hard, laborious work, by a practice of lighter work, he is put to the plow early in the spring and, it being the "rush season," when the spring plowing must be done quickly so that the seed may be planted in due time, the horse is pushed to his limit. And to relieve his burden, the farmer raises the devices upon his plow that regulate the depth of plowing, and shallow plowing becomes the rule upon the average farm.

Recently the author went into a field where a farmer had two light horses, neither weighing over 1200 pounds, hitched to a common walking plow. He was attempting to plow a stiff soil, deficient in any loosening matter. It was cold, compact, and within less than a depth of three and a half inches, had not been broken for a long



A MEDIUM SIZE GASOLINE TRACTOR.

This tractor as shown in the illustration was pulling five fourteen-inch bottom plows, plowing nine inches deep, operated with a "self lift" set in action by pulling the small rope shown attached to plow and engine cab, thus making the tractor and plows a one-man outfit.

series of years, and so was like hard pan. It was that undercrust of soil which we find upon most of our soils, underlying the usual plow depth, caused to some extent by the passing of the bottom of the mold board plow through the soil. This man, by actual measurement, was breaking up this soil to an average depth of three inches. When asked by the author why he did not plow deeper, he replied that when he adjusted his plow to plow a greater depth, or so that it would penetrate the hard soil underneath the depth of three or more inches, his horses could not pull the plow. It was a case of lack of motive power, so he set his plow to do shallow plowing. And it may be of interest to know that the corn grown upon this shallow plowed soil did not average ten bushels to the acre.

Experimenting with riding gang plows of two twelve-inch bottoms, plowing in average soils as to compactness, the author has found that such plows, plowing to a depth of five, or six inches, can be easily drawn by four average farm horses; but when set to plow seven, eight, or nine inches, the minimum depth to which any soils should be plowed, the drawing of these plows becomes a difficult task.

In the past five or six years the author has experimented with, and has investigated the breaking of the soil with modern gasoline and steam tractor plows, and he has found the same condition to obtain with most every one of these plows that he has operated upon his farms, or seen operated. As long as their plows were adjusted to plow five or six inches in depth, their engines

pulled their loads easily and economically as to fuel and operating expenses, but when greater depths of plowing were required, say nine or ten inches, then most of these plowing outfits were even unable to pull their loads, or if they did, it was at too great expense for fuel, or too slow a speed for economy. Yet some were a success.

Recently the author went to a State adjoining the one in which he resides to see the operation of a large and much advertised gasoline tractor, with an eight twelve-inch bottom plowing outfit. It was plowing an old blue grass pasture field and the sod was heavy. They attempted to plow this heavy sod with the eight bottoms at an average depth of five inches, and failed. They took off one bottom and again failed. Another bottom was removed with like failure, until finally, pulling five bottoms, they could make fair progress. But the job of plowing was such that the sod was not overturned to a sufficient depth, and the soil was so broken up that the sod would not be well turned under so it would be destroyed or would so rot that the blue grass would be killed and the field be put in fit condition for cultivation.

But why do we plow? To loosen up the soil and prepare a seed bed in which plants will grow and develop and reproduce their kind.

The proper development of the plant into that condition that will cause it to give its maximum yield of matured fruit, grain and produce, is the consummation desired by every one who tills the soil, but plants will not do this unless the seed from which they sprang has been sown in a properly prepared seed bed which is stocked with

fertility so the plant will have the elements that feed it, and the loosened soil that can be successfully cultivated, and in which the plant can develop its root system. Most of the plants grown upon the farm have a fairly large root development. It therefore is apparent that they should have a considerable loosened soil space in which properly to grow their roots. Rare is the plant that will develop a large root system in close compact soil, and rare is the plant that will come to full maturity and harvest without the development of a large root system.

Soils in the progress of formation were kept loosened up considerably deeper than they were ever afterwards plowed, by the growing roots of trees, plants, shrubs and wild grasses, and the great amount of organic matter put into them by these agencies. The roots of the vegetation mentioned pushed down into the soil in every direction and loosened it up more effectively than could be done by any plow. And the great amount of organic matter put into the soil by the decaying of vegetation kept it loose so that plant and tree roots could properly develop, so thrifty and luxuriant vegetation grew upon these soils before they were brought into cultivation.

When cultivation began upon them and they were subjected to years of crop growing, the organic matter in them was eaten up by growing crops and they became compact. Year after year they were plowed and cultivated to the same depth so that there was formed under the plowing depth a plow sole or a stratum of hard earth, through which water slowly passes and plant roots cannot

enter. If the soil stratum above this plow sole is from three to six inches in depth, it quickly becomes saturated with water in flood time, which rapidly runs off carrying with it the dissolved soil, resulting in great erosion and badly washed fields. And what soil remains, being of so thin a stratum, quick evaporation of its moisture results, and havoc is wrought to the crops growing upon it, and the plow sole prevents any moisture coming from below by the process of capillary attraction.

The true theory of deeper plowing is that the soil may be loosened up to that depth which will gather a large quantity of moisture, when moisture is available, and which can by proper methods of cultivation be retained in dry weather for the use of the growing plants, and that will give plants, especially the deep and extensive rooted ones, the best environment for their proper and full development.

Recent experiments in dynamiting the plow sole and hard sub-soil of soils which resulted in the thrifty growth of fruit trees, alfalfa, corn and better crops generally, prove that the theory of deeper plowing is not an idle dream of the theorist.

The success of dry farming is due to the fact that the soil is plowed deep so that it can gather a large supply of moisture when moisture is available, which is afterwards conserved by its practices of cultivation, especially designed to conserve this gathered moisture. Where green manuring and the plowing under of cornstalks or other matured organic matter upon the farm is practiced, deeper plowing must be practiced upon

the farm or the organic matter cannot be turned under successfully and in a manner that insures success in growing crops.

For forty years the average depth of plowing in North Carolina was four inches and the average of corn grown in this time was fifteen bushels to the acre. The government experimental farms for the year 1912 plowed three thousand acres a greater depth and secured forty bushels to the acre.

In the Dakotas, where wheat is extensively grown, mostly by the large ranch farmers, plowing is mostly done by the steam and gasoline tractor, pulling plows with a large number of bottoms, and shallow plowing from three to four inches is practiced with the result that a wheat crop is secured only in seasons of plenty of moisture, and even then such crops are not secured that would be if deeper plowing was practiced, and money in wheat grown under such conditions is made by putting out a large acreage at the lowest expense for planting and harvesting. If the growing season be dry, failure results. Yet experiments in that region with deeper plowing have proven that if the soil was plowed deeply and worked with the end of moisture conservation in view, greater crops would be secured in seasons of plenty of moisture, and paying crops even secured in dry seasons, and such crops secured that would pay the small farmer to grow wheat and would make available the fertility locked up in the soil stratum lying below the present three or four inches of soil generally broken up, and this, to some extent, would relieve the situation of ex-

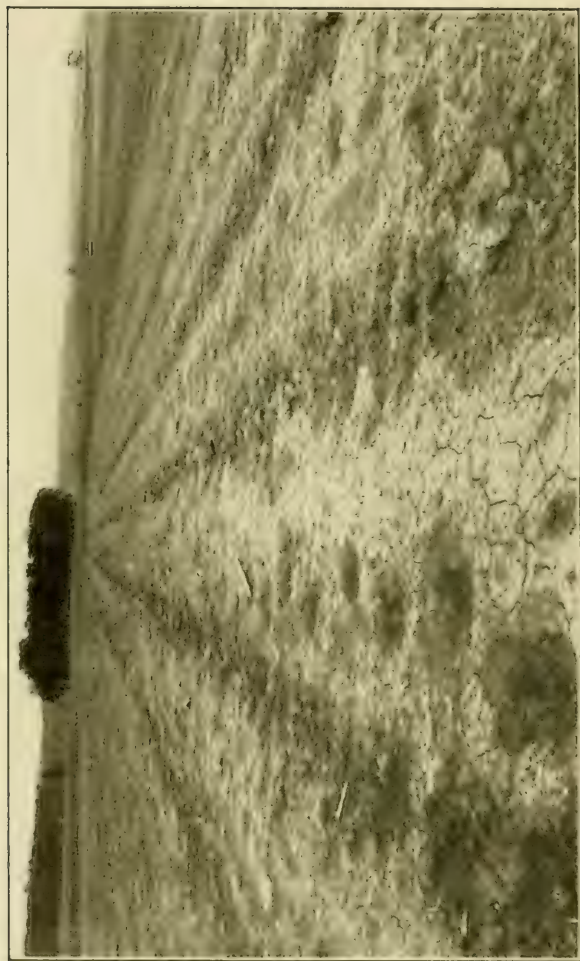
hausted fertility now becoming so common in that country.

The author has experimented with the deep tilling machine that plows the soil from ten to twenty or more inches in depth, and he has gathered the results of the experience of others with the same machine. These experiments prove that deeper plowing which is nothing more than better tillage, is one of the best remedies for the restoration of our ailing soils, because it makes available for plant food the locked up fertility in the stratum of soil below the plow sole which has lain dormant so long.

It also proves that the farmers of America have too long allowed themselves to be frightened by the "scarecrow" of "turning up too much bottom soil" flaunted by well meaning persons, no doubt, but which has so encouraged the shallow plowing practice by the American farmer who was eager to adopt its principles because shallow plowing was so much easier done, and so relieved the burden from his horses and mules that furnished the motive power to move the plows.

In the consideration of the question of the proper method of plowing we must determine first what is deep plowing, or what is shallow plowing?

To draw the line of demarkation between the two would simply be the opinion of the individual making the definition, for there has been no standard definition fixed. However the general consensus of opinion seems to be, and which ought to become the fixed standard, that any plowing of



SOIL PACKING BY A TRACTOR.

This land was plowed with the heavier tractor and smoothed down with the drag. This picture was taken after a rain had fallen. The smooth spaces are the land traversed by the tractor.

nine inches and over is deep plowing, and therefore, any plowing under nine inches is shallow plowing.

In the author's judgment this standard is as good as any that can be fixed, for he has learned by observation and much experience that the plowing of most of our soils to a depth of nine inches is the plowing of them to that depth that gives the full benefits of deep plowing. Nine inch plowing, done with the proper plow, breaks up the plow sole, properly incorporates any organic matter that may be upon the surface of the ground with the soil, and makes a seed bed with sufficient room for the proper root development of most any plant grown by the farmer, and gives a large storage room for moisture when it is available to be conserved and used for future crop growth.

Not every plow is capable of plowing the soil more than nine inches in depth. It can not be done successfully with the two horse walking plow, for the draft will be too much for the horses. And many of the single bottom three horse riding plows, and the two bottom gang plows, are not so constructed that they will turn correctly the nine inch furrow slice. Their construction has had in view the turning of a five, six, or seven inch furrow slice. Yet some of these plows will do nine inch plowing successfully. Illustration on page 125 shows one of them at work turning as nice a nine inch furrow ever seen upon the farm.

Many of the modern disc plows will plow nine, ten and twelve inches in depth, and do a job of perfect plowing and with light draft. Illustration

tion entitled A Medium Size Gasoline Tractor shows a modern tractor doing perfect deep plowing.

While the invention of the gang and many bottom tractor plows has led to extensive rather than intensive farming, by which vast tracts have been brought into cultivation, and sown to the same crops year after year, and which led ultimately to their exhaustion of fertility, yet these plows can be made to do a great service to the farmer who conserves and builds up the soil fertility, as it will enable him to plow his soil the proper depth, and at a reduced cost per acre, and at a time when it is in proper condition for breaking. And many of these tractor plows have sufficient motive power for moving plows at the proper depth and economically.

The summing up of the whole matter of plowing is that taking in view the present condition of our soils and their needs, we must secure the breaking plow for our farms that will

1st. Properly turn over the soil to a depth of nine or more inches.

2d. That will as near as possible turn completely under green manuring crops and other organic matter.

3d. That will as little as possible press together the soil grains at the bottom of the furrow slice so as not to interfere with capillary action.

4th. That have the lightest draft.

5th. That can be rapidly moved in the most economical manner, and yet do proper work.

6th. That will reduce surface soil packing to a minimum. Surface soil packing by plows per-

tain only to tractor plowing outfits, and upon soils susceptible to packing.

When we have secured the proper plows for our farm we must have sufficient motive power to move them and keep them going when the soil is in the proper condition for plowing. A vast amount of injury is done every year by plowing our soils when not in proper condition for plowing. Soil is only in proper condition for plowing when it is neither too wet nor too dry, and as the period when the soil is in proper condition for plowing is so short, the importance of plenty of motive power is apparent.

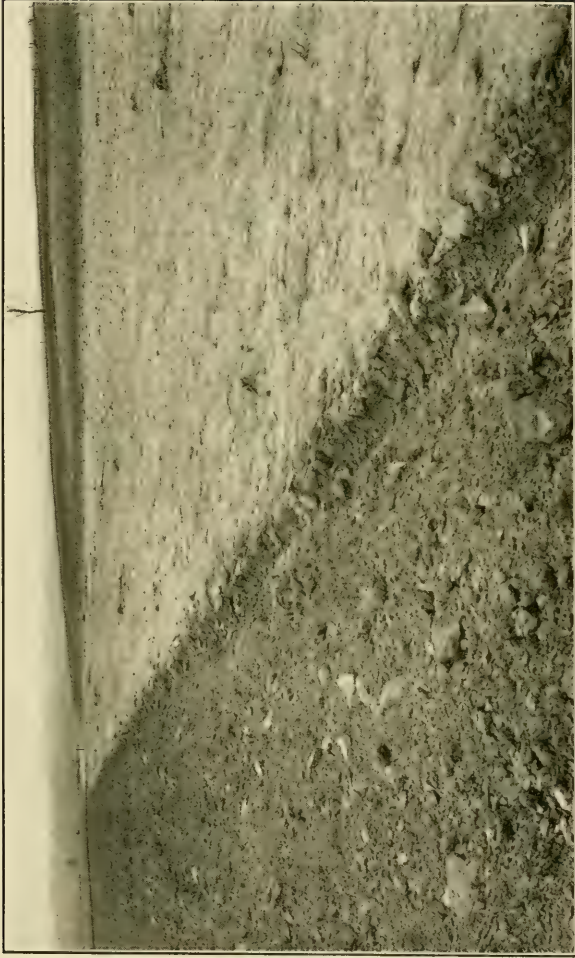
Farmers figure that the keeping of more horses upon the farm than is needed for the cultivation and marketing of the crops grown, is expensive and eats up too much of the profits of the business. And there is truth in this contention. Yet we must consider the damage resulting in not breaking up our soils when in the right condition. The problem is not without its difficulties and has given the author more trouble than any of his farm problems. He has felt that the true solution of the question is a light tractor, weighing 6000 pounds, or less, with a two or three bottom plowing outfit, capable of coming up to the specifications of the proper plow for the farm heretofore given, and especially the specification as to the packing of the soil.

Such an outfit could be operated economically and could be kept going night and day when the right period for plowing is at hand. And then when the plowing season was over it could be subjected for many uses upon the farm, and even

when not in use would be at no cost of maintenance; it would be of no expense to the farmer except the slight cost of depreciation, interest and insurance, and would be an immense saving over the cost of keeping an extra supply of horses for plowing which would be doing nothing at other seasons of the year and whose cost of keeping is so great.

The author ventures the prophecy that the day is near at hand when, not only all our breaking of the soil will be done by the small farm tractor, but cultivation, hauling to market and much, if not all other farm work will be done by these tractors, and by cultivating implements propelled by gasoline or electricity manufactured upon the farm. It is practicable and only remains for the genius to invent the farm machinery necessary, and the author has so much faith in the American mechanical genius that he believes that this is a consummation that will come to pass and soon become a part of our farm economy.

But until this is brought about upon our farms we must continue to use the motive power of horses and mules, and we can reduce the cost of such power, and minimize other objections, only by installing upon our farms the heavy draft horses which cost but little more, if any, to feed and care for than the horses of lighter weight. With the heavy draft horses plows can be moved easier, and plowing can be done to proper depths and at the lowest possible cost and at proper times. But to do this, we are again confronted with the question of lack of capital, for the first cost of large draft horses is heavy.



AN EXAMPLE OF THREE-INCH PLOWING. PLOW SOLE NOT BROKEN UP.

The crop grown after this plowing did not pay cost of production.

Every farmer knows, or should know, that proper plowing contributes much to successful farm operations, therefore we wish to emphasize these facts: that plowing must be done just at the right time in order to secure the greater success in the growing of crops; that the plowing or breaking up of the soil in the spring of the year is the hardest task upon the farm as the time is limited for its accomplishment, and there are generally but few days when the soil is just right for breaking; that generally the soil plows hard, horses are "soft" and unused to work, and that to do the work right the soil needs to be broken deeply which means power to move the plow.

The average farmer from lack of capital has but few horses and they, as a general rule, are light in weight and totally unsuited for heavy draft purposes, consequently in a majority of cases, plowing is never done at the right time or in the right manner.

If plenty of capital were available to most farmers they would or could provide themselves with a sufficient number of horses of sufficient draft capacity, to move sufficient plows, plowing a sufficient depth to insure the breaking of their soil at the right stage and thus secure a satisfactory crop yield.

When Roman agriculture was at its height of perfection, Rome was flourishing as the greatest nation then on earth, and her greatest agricultural writer recorded that the first principle of agriculture was "to plow well." That the second principle was to "plow again," and many Roman tillers of the soil plowed their lands as many as nine

times for a single crop. It was their creed to plow well and in good weather so as to avoid clods. The successful Roman farmer never allowed his eye to deceive him, for he knew that too often the smooth surface of the soil left by plowing conceals the clods. So he took the sharp, stout stick, and drove it into the newly plowed soil. If it readily penetrated the soil to the plow depth, he knew the plowing had been well done, and that there were no concealed clods. If the stick penetrated the soil with difficulty, he knew his plowing had been badly done, and that the soil had broken up cloddy, and so would not be in the proper condition for the successful growing of crops. To avoid clods they advised against plowing their lands before the 13th of April.

While the farmer of to-day is more interested in how soils should be plowed now, yet if he would but study how the best farmers, even the farmers of thousands of years ago, plowed their soils, he would get the greater inspiration to plow well. We have frequently said that soils after they have been cultivated for a score or more of years, plow differently from the way they did when first subjected to cultivation, for when the vegetable or organic matter content has been reduced in them, they become compact and easily assume the cloddy condition, and to plow them in this state when they are too freely saturated with moisture, means to secure the cloddy seed bed, which under present soil conditions, is one of the most serious menaces to successful farm operations.

Never plow the clay soils when they are too wet,

for if so plowed they may be years in recovering from such evil treatment.

He who is possessed of sandy soils is too often imbued with the erroneous notion that the soils can be safely plowed long before clay soils are in proper condition for plowing. There is as great, if not greater danger in plowing sandy soils when too wet. The author is speaking from experience of years in the plowing of sandy soils. The plowing of those soils when too wet, especially when they are short on organic matter content, means that they will pack and become like mixed cement and sand, and so become almost utterly incapable of being put in condition for the successful growing of crops upon them, until they have been restored by severe freezing, and filling with green manuring crops and organic matter.

Farmers, get the vision of proper plowing. Secure the plow that does not belie its name. Plow with sufficient motive power. Plow when soil is in condition. Plow deep. Plow to reduce "dead furrows" to the minimum. Plow æsthetically.

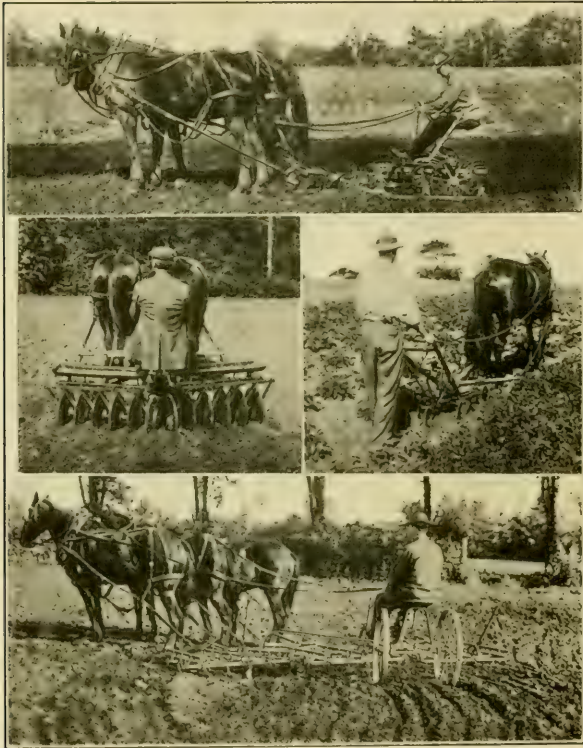
The plow that does not belie its name is the plow of light draft, and one which cuts the deep furrow slice and turns it completely over so that any organic matter being plowed under will be covered beyond the reach of cultivating machinery, leaving the upturned soil as nearly level as possible.

The "dead furrows" produce crops of stunted growth, and this stunted crop growth appearing too often in our fields, not only reduces the total

crop yield to an extent worthy of considering, but produces unsightly effects that the true farmer no more desires to see than he does the "runts" among his farm animals.

While these "dead furrows" can not be entirely avoided, yet by a little study and planning, which planning and study can be done at idle times, they can be largely eliminated.

The æsthetical side of plowing is to plow in straight lines, to avoid the "dead furrows," and to secure the pleasing effect to the eye, for the neatly and well plowed fields, plowed in straight lines, bespeak the skilled farm workman who does his work right and with thoughtful care, and mean that his every work upon the farm will be done with the same skill and attention, thus securing success in the business of farming.



THE GOOD TILLAGE IMPLEMENTS.

(Courtesy International Harvester Company, Chicago, Ill.)

CHAPTER X

THE PREPARATION OF THE SOIL AFTER PLOWING FOR THE SEED BED

TO properly prepare the soil for the seed bed after it is plowed or broken up, is as important as the right plowing of the soil, and yet few farmers give this the attention it should receive. The author has always contended that the soil properly prepared for the seed bed after it has been plowed is half the cultivation of the crop, that is, if the soil be put in the right condition for planting that the crops grown do not need thereafter one-half the cultivation usually given, and besides there are other and important advantages to be obtained.

Old agricultural writers of practice contended that "tillage is manure." That proper preparation of the soil is nothing more than intensive tillage, and that intensive tillage pulverizes and mixes up the soil, that it paves the way for the release of soil elements that feed the growing plants. But how are we to get this tillage or proper preparation?

1st. We must have the proper implements with which to do it.

2d. It must be done at the right time.

3d. The tillage must be thorough or in quantity.

If soil is hard, compact, and devoid of the

proper moisture to make it break up and turn over loose by the breaking plow, we will have the clods, a hindrance to good tillage and a menace to crop growth, if steps are not taken immediately after plowing to break them up. And even if the soil breaks up loosely, it is necessary to submit it to proper tillage to conserve moisture and to bring out or make available the fertility within it.

Various pulverizing devices to be attached to breaking plows have been invented, which are designed to work down the soil to smoothness and fineness at the time the soil is plowed. Some of these are successful, but they generally add to the already overburdened plow moved by horses, and so are impracticable for that reason. So the farmer must rely upon the implement designed to run separately from the plow. Such implements heretofore used are the roller, the harrow, the disc, the pulverizer and the drag, the most commonly used being the harrow. While the harrow is a satisfactory implement to be used for this purpose, when soil plows up in a loose state, it should not be relied upon entirely to prepare a proper seed bed. The common spike tooth and spring tooth harrows are the most common and best types of harrows to use.

The roller is one of the most valuable implements upon the farm, but must be used with judgment. If soil is already too moist, it does not need the roller; in fact, the roller would injure it. In the absence of too much moisture, it should always be used and must be used when green manuring and the plowing under of other organic matter is practiced upon the farm.

The modern up-to-date double disc, one section of the cut away pattern and the other section the common round disc, is a farm implement of great value and should be extensively used in all soils, and no other implement will give the proper tillage that this implement gives to the soil. Of course it requires power, four horses, to properly move it, but it has capacity for quick work, leaves the soil level, and certainly gives the best tillage of any farm implement designed and built for that purpose.

The drag, an implement of home manufacture, for they are generally made upon the farm, is another valuable implement which gives the best of tillage if properly constructed. They should be made of heavy one and one-half or two inch plank, and of weight that requires at least three horses to move them. The author regards the drag as one of his most valuable farm implements to use in the preparation of the soil for the seed bed. In the first place it is not an expensive farm tool. Any farmer with material can easily make it. It levels and pulverizes the soil and packs it correctly so as to aid conservation of moisture. Of course it must be understood that the drag should never be used when the soil is too wet. Like the roller, it must be used with judgment.

Most farmers are content if they simply harrow their soil after it is plowed, before planting the seed. In the present age this is a serious mistake. We have already shown that when our soils were first brought into cultivation such a method of preparation might be successful, but it will no longer do to practice this system. To get the

best service from the soil in growing crops we must give it intensive tillage before planting the seed.

The soil should be subjected to this process of preparation within a few hours after it is plowed, for the sooner it is thoroughly prepared for the seed bed the better, as it is then put into condition for the conservation of moisture, and the soil is in its best condition for pulverizing and working up to the best seed bed.

Where failures have been made in plowing under heavy crops for green manuring purposes, it has invariably been due to the fact that the green crops were not properly plowed under as to depth and covering with soil, and the soil was not sufficiently packed with the roller or drag after plowing.

If the farmer would, in the various processes of crop growing, be as careful as the manufacturer is in his various processes of manufacturing his products, so as to get the best finished product, he would make a better success of farming. Both farmer and manufacturer must give important consideration as to cost, yet the value of the finished product must always be kept in view, and it must not be sacrificed for cost. Therefore, any process that will obtain a better and greater quantity of the finished product must be installed upon the farm as well as in the manufacturing plant.

If the proper development of plants needs a better seed bed of thoroughly pulverized drained soil, full of organic matter so that it becomes a favorable environment for ventilation, heat, moisture, soil bacteria and the other essentials of plant

growth, then the farmer can not afford to spare any expense or labor to secure that end, for it means more and better farm products and better prices for same. So the author contends that many of the failures of crop growing are due to the fact that the farmer does not properly prepare his seed bed, even after he has drained, fed, and broken up his soil.

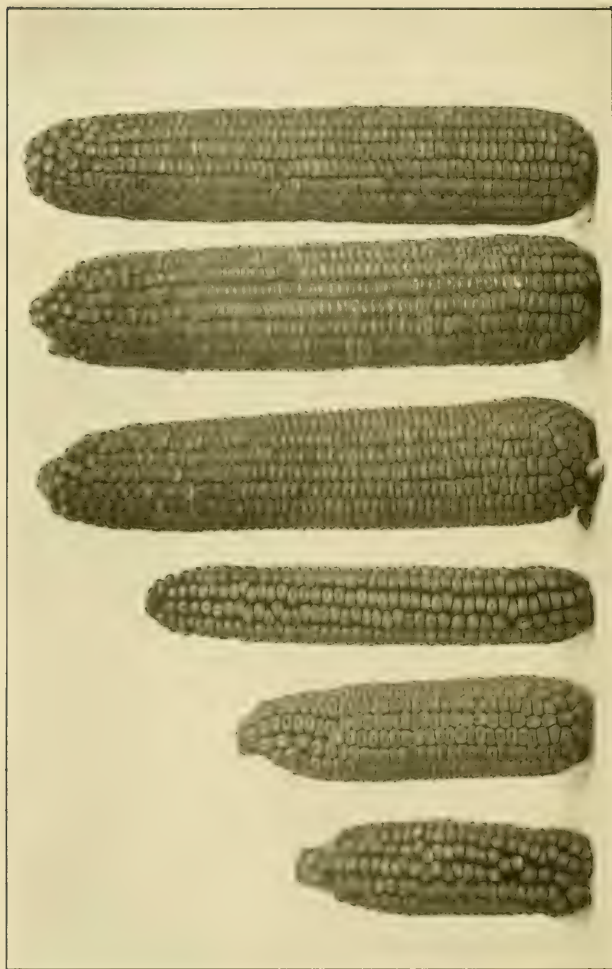
The author, from a long experience, has been convinced that the old agricultural writers stated a great truth when they said that "tillage is manure," and every farmer, if he has any sense of observation, and he has no business to follow the business of farming unless he has such a sense, has certainly observed that the better his soil has been worked down for the seed bed, the better he can plant his seeds, and cultivate his plants, the better they will grow, and a greater eradication of weeds will result.

In the consideration of costs we must never forget results. If increased cost will result in more and better products, and conserve and increase the fertility of our soils, we should pay the price.

Therefore, in the preparation of the soil for the seed bed, we should not let cost prevent us from the frequent use of the harrow, the roller, the disc and the drag, if it will put our soil in that condition that will produce the heavier burden of crop growth, and the better product, for such a result means the greater profit, besides the glorious satisfaction of doing and accomplishing something worth while.

The results of better farming are what every one must strive for who desires to make

a success of the business of farming, and these results can be obtained in the greater measure if the tiller of the soil will catch and put into action the spirit of thorough tillage before the planting of the seed.



LIKE WILL NOT ALWAYS PRODUCE LIKE.

All six of the ears of corn shown above were grown from the same seed ear, which was as near ideal seed as is possible to obtain. Why the difference in size and quality? The ears on the right were grown upon fertile soil, while those upon the left were grown upon worn-out soil. Conditions of soil must be favorable for seeds to reproduce in kind.

CHAPTER XI

SEEDS, SEED SELECTION AND SEED PLANTING

TO insure success in the business of farming there must not only be a combination of all the elements that enter into the business, into the harmonious whole, but each element must be perfect within itself.

The most perfectly developed seed, a single element of the business, will not reproduce itself in kind if it is planted in a soil, another element of the business, that has been shorn of its fertility.

This truth was exemplified in the parable of the sower uttered by the Christ to the multitudes by the side of the Galilean sea. The sower went forth to sow one kind of seed and that which fell into the thin stony soil sprang up and for lack of the deep soil that gives forth moisture and plant food, either withered away and died or reproduced the inferior seed. The seed that fell upon the fertile soil full of weed and thorn life, was choked by their thrifty unchecked growth. But the good seed that fell into good ground put into proper condition and cared for by the careful husbandman brought forth seed of its kind, even to a hundredfold.

We are thus taught that while seed selection is a most important thing in the business of farming, yet when we have selected the good seed our

work is only begun; we must reach out further and secure those conditions of good soil, good tillage and careful cultivation that give the seed the chance to live, grow and reproduce.

This truth was "driven home" to the author in a most emphatic manner the past season. He secured some of the best Reed's Yellow Dent Seed Corn that could be found in Indiana, getting the seed on the ear, and paying a fancy price for it. Every ear was almost perfect and was carefully tested. One bushel of this seed was planted as an experiment upon a plot of soil, every part of which was of the same character of soil, but part of it was worn and to this no fertilizing matter had been given. The remainder of the plot had been fertilized with green manuring crops until it was in a most fertile stage. The entire plot was plowed the same depth and given the same tillage and put in the best possible condition for the planting of the seed. The corn was planted with the same planter and to the same depth. Cultivation afterwards was the same upon all parts of the plot. When the corn was harvested that upon the worn soil was inferior and of the stunted growth. The seed had not reproduced in kind. The corn upon the good ground produced the hundredfold crop of fine perfect corn; the seed had here reproduced its kind and the truth was emphasized that seed will only reproduce its kind when conditions for growth are favorable, and that success in producing the manufactured products of the farm depends upon a good combination of all the elements that enter into the business. In seed selection these rules should obtain:

1st. *The Variety.* In the selection of a variety we must first determine whether it is suitable for the locality of our soil. Its quality of productiveness and ability to mature its crops in the growing season. The quality of its kind and feeding value, and the demand for the products it produces in our particular markets.

2d. *The Quality of the Seed.* By this we mean that the seed must be of the variety we desire to plant; sound, well matured, and of strong germination. While the trained eye can detect both the good and the weak points in seeds, yet the only safe way is to test the seed in the testing box.

3d. *The Vitality of the Seed.* Seed may germinate and yet be utterly worthless. Seedsmen seeking to dispose of their inferior seed too often insist that their seed is good because it germinates well, but that is no criterion of good seed. The crucible test of good seed is a vitality strong enough to withstand the vicissitudes of adverse conditions of soil and weather after it has germinated. The seed may germinate and send forth a plant so weak in vitality that it readily succumbs to heat, cold, or other adverse conditions that every seed and plant must encounter in its growing process. The prematured seed is always weak in vitality. Nature always matures her seeds in the most thorough manner, and this is the reason she has always perpetuated her many varieties of plants when unaided by man. Man goes into his fields, plucks the seeds of plants before they are matured, carefully stores and cares for them, and often they fail to grow and reproduce in the full strength necessary. Old

Nature does not gather her seeds, she protects them with certain coverings and surroundings, matures them upon their mother plant stems or vines, subjects them to moisture, sunshine and cold, and yet they grow with strength and vigor, and reproduce in profusion.

A simple illustration proves these facts. In early spring we often see ears of corn in our stock fields that have escaped the harvest. These ears of corn would be plowed under and when heat, moisture and other agencies had done their work, every grain upon these ears would send forth a strong, vigorous plant.

Understand that the author is not advocating the saving and caring for seeds to be left to Nature, but he is trying to emphasize the truth that seeds must be matured in order that they be possessed of strong vitality.

4th. *There Must be Uniformity of Seed.* Some authorities claim that this trait of seeds is the most important; that seed may be strongly marked as to germination, strong vitality, productiveness, etc., yet if it lack in uniformity it is utterly worthless for seed purposes.

By uniformity we mean uniformity of type, color, time of maturing, etc. Seed unevenly matured means that in many crops we have the plants showing in the field all stages of maturity. Blossoms and maturity will appear at the same time, which can result in nothing else than loss. By uniformity we mean that the seeds we plant must be so alike in all the essentials required of good seeds that they will send forth plants that will mature their crops at the same time. If you



THE GOOD SEED.

Seed selection is an important element in the business of farming which, combined with the other elements of the business, makes a harmonious whole that brings the "greater success."

were planting peas for a canning factory, and planted ununiform pea seed, it would mean that at harvest time you would have all stages of growth from the blossom to the over matured pods, which would result in great loss. And this would be true with many crops.

Uniformity is not an easy thing to obtain, and so this fact is the cause of so much seed of this character, and of so many dishonest seedsmen. Seedsmen resort to what is known as the "blend" practice, which is the mixing together of crops of seeds grown by their different growers. Seeds produced by different growers in different localities upon the different varieties of clay, prairies and light soils, of different degrees of fertility, affected by different growing conditions, harvested at different stages of maturity, and under varied treatments as to sowing, harvesting, curing, etc., affects vitality, germination, and produce the ununiform seed.

This is one of the main reasons why the author has always advocated that the farmer should always grow or produce his own seed wherever it is possible to do so. But some seeds he can not grow if he would, and so in the purchase of these he is at the mercy of the seedsmen, unless he becomes an expert in the judging of seeds, and why should he not make himself an expert? He must do it if he wishes to make a success of the business of farming. There is much in the old axiom "If you want a thing done right do it yourself." Follow this advice as much as possible and your success in the business of farming is assured.

Our illustration in this volume entitled "Like will not produce like," should send home the lesson that to produce uniform seed we must have soil of uniform fertility. No matter how good your seed may be it cannot reproduce uniformity where some seed is sown on worn soil and some on good ground. Ever remember the truth exemplified in the parable of the sower.

The seed sown on the poor soil lacks in development because it has been starved. The elements that enter into good seed that make the seed the best of its kind were not in the soil, and so the plant was starved and its offspring was weak and lacked in uniformity.

To be able to judge uniformity the farmer must familiarize himself with the size of the varieties of good seed of the different crops he would grow. Then if the seed he wishes to plant are not uniform or are radically different as to size, some exceedingly small or shrunken, and but few of them measuring up to the fixed standard as to size, he must know that these seeds are lacking in vitality; that some will germinate slower and make less rapid growth, in fine, that the planting of this kind of seed means nothing but financial loss besides worry.

Some one has said that seeds should be classed as follows: "Poor, very poor, and almighty poor," and many are to be classed entirely to themselves under the appellation "mighty d—n poor." The "blend" furnished by too many seedsmen come under the latter class.

The author was severely "touched" by dishonest seedsmen before he learned the "seed game"

and his purchase of seeds for the past eighteen years has run up into the thousands of dollars each year. He is now writing from experience and wants to emphasize the truth that you must learn the "seed game" if you wish to avoid financial loss and much worry.

It is also important that you know the locality in which your seeds have been grown, for it is a fact that the seeds of certain plants grown in the irrigated regions of the West will not germinate forty per cent. if kept over one year, and that seeds grown in a mild climate will germinate in a colder climate, but the plants that spring from them are unable to endure the tests found in the more severe climate.

5th. *Adulteration and Misbranding.* The author can hardly write upon this head with that composure one should possess to write unbiasedly.

If the adulteration of seeds were made a crime punishable with the punishments of the Inquisition, the punishment would be none too severe. And why should he not write with righteous indignation upon this subject? For the past eight years he has learned from experience and investigation of the great fertilizing value of the vetch plant. By much writing in farm journals and through his Book of Vetch he has attempted to disseminate the virtues of this plant to those who are engaged in the business of farming. But what was his consternation when he learned that many had failed with the plant; and what was his indignation when he learned that the cause of the failures was adulteration and misbranding of vetch seed. The government through its agricultural depart-

ment spent a year investigating the adulteration of vetch seed, and the results of this investigation were enough to work up the righteous indignation of any one. Out of 303 samples examined, 187 or 62 per cent. were adulterated. Five samples did not contain a single seed of the variety named and others were mixed with other vetches. Of all the vetch seed purchased as of a certain variety, but 55.9 per cent. was capable of germination. Do you wonder then that the author can not write upon this branch of the seed subject with composure?

And within the past year the author contracted with a prominent seed firm for them to grow him one thousand bushels of pea seed at four dollars per bushel, the same to be suitable for seed purposes. When these seed came in and the author examined them he found so great an ununiformity in them that to plant them would mean a loss of thousands of dollars. It was clear that the seedsmen had practiced the "blend act" to the limit, for the greater part of the seed were small and immature. Of course the author rejected the seed, yet the seedsmen is contending that the seed are the very best because they were all planted from good seed stock, which, as we have shown, means nothing where conditions necessary for the proper development of seeds are lacking.

We have written enough upon seeds and seed selection to show the great importance of the subject as it pertains to the business of farming. But there is another element as important as good seed, and which further demonstrates the truth

stated in the beginning of this chapter, that there must be a harmonious combination of all the elements that enter into the business of farming to make it a success. This last element is the planting of the seed.

The best seed ever grown if not properly planted is no better than the most worthless seed. And that branch of the business of farming more clearly demonstrates the necessity of mixing brains, thought and study, with the business of farming.

Scarcely two varieties of seeds can be planted in the same manner as to depth, season, etc. Seeds vary in size and character of covering. Some send forth the tenderest plants, and some the hardy plant. Frost or cold will kill the one and not harm the other. Some seeds that even send forth the fairly hardy plant, if planted at too great a depth will not germinate at all. This is exemplified in field and sugar corn. The seeds of these two plants, planted three to four inches in depth in cold, compact soil, will scarcely germinate and grow twenty-five per cent., and generally not at all.

In many plants the character of growth is such that if the seeds are planted at too great a depth it is necessary that the plant readjust itself to the conditions of planting which result in a checked or stunted growth. An illustration of this principle is found in the corn plant. Corn has two sets of roots, one above the surface and the other underground. The ones above the surface are the brace roots which shoot out from the plant above its first joints about an inch above the grain.

Plant the grain or seed too deep, a new and unnatural joint must be formed at the surface (for it is never formed under the surface) from which the brace roots begin to grow. So corn planted at a greater depth than one and one-half inches must readjust its plant so as to meet this depth of planting and form the unnatural joint for its brace roots and in so doing, its growth receives a check that affects it and its life.

Seeds must be planted as nature intended they should be. The small alfalfa seed sown at too great a depth cannot germinate, and yet if given the light or no covering, may encounter conditions that prevent its growth. So the reader can readily see the necessity of mixing brains with seeds, seed selection, and even seed planting. We must know the characteristic of each and every seed we use in the business of farming, and learn how to plant them to bring the greatest success. And in this study we will see the importance of properly preparing the seed bed so that the right soil covering can be given seeds. If you could but sit down and figure out the loss that occurs each year from the improper planting of clover seed you certainly would strive to figure out in your individual case the method of proper sowing so as to avoid your loss at least. Yet farmers go on and on following the old methods of sowing clover seed that have been in vogue for years without any apparent reason for so doing other than that father did it that way.

To aid and protect the business of farming in seed selection there ought to be a national law

with severe penalties for its violation along the following lines:

1st.—Providing that all seeds offered for sale must be true to name or not be mixed with noxious seeds.

2d.—Providing against fraudulent and misleading advertisements of seeds.

3d.—Providing that seeds are misbranded and fraudulent, when they are ununiform and of low vitality.

4th.—Providing for statement on label or package stating the state or locality where grown.

CHAPTER XII

OTHER AIDS TO THE BUSINESS OF FARMING

IN the preparation of this book it has not been the purpose of the author to discuss the details or the practicability of growing the different crops grown upon our various farm lands, showing how they should be planted, cultivated, harvested and utilized. This could not be done in one volume, and besides, it is the aim of this book to so present the importance of the business of farming, that its efficiency will be increased and the whole business may be put on a more scientific and businesslike basis, and to further show that it is a business as profitable and with as many opportunities of right home building and living as any other business. To do this it is not necessary to discuss various farm crops and how to grow, harvest and sell them.

We have already stated that those who own or occupy farms must themselves determine the kind of crops to which their land is adapted. But they must study market facilities and conditions for their lands may be especially suitable for the growing of certain crops for which there might be no market at all.

We know of no business that requires as much mixing of brains with its details as does the business of farming. First, we must study our soils



POSSIBILITIES OF SCIENTIFIC FARMING EDUCATION PUT INTO PRACTICE.

The above shows the accomplishment of Texas farm boys and girls, the Texas "Farmers of To-Morrow."

to ascertain their needs, and then we must know how to supply that need. We must know how to prepare our soils for the crops, and how to plant, cultivate and harvest, sell, or utilize the crop. We must know about all the aids, hindrances and discouragements of the business. And we must know the characteristics of different farm crops so as to ascertain if we can profitably grow them.

Crop knowledge has been so disseminated in recent years that most farmers know what crops are suitable for their localities. Yet we must not forget that it is a fact, which has been forcibly demonstrated in recent years, that there are many crops that can be grown with great profit not only in dollars and cents, but for the compensation of the soil, which were formerly unknown to the farmer or were believed to be unsuitable for general or extensive culture. As for illustration, take alfalfa, vetch, soy beans, cow peas, and numerous other crops that might be mentioned. A few years ago the growing of these crops was looked upon as the fads of impracticable men. But now we know they are the godsend of agriculture.

When the farmer determines the crops he is to grow, then he must begin to look about for the hindrances he is to encounter, or the aids he needs in the growing of the crops he selects for his land.

We have shown the importance of having a good soil, how it may be secured and put in order for crop growing, and many of the hindrances the farmer will encounter and aids he will need, yet there are others worthy of consideration and that will help him in his business which we will for a time consider.

PREVENTION OF DISEASE OF LIVE STOCK, ETC.

In the production of live stock on the farm every precaution must be taken to prevent and cure disease to which all animals are subject. The prevention of disease is the most important, for an "ounce of prevention is worth a pound of cure." The stockman who does not do all the things necessary to prevent disease has already failed in his business. The same is true of the orchardman, the grower of small fruits, or the grower of grains.

Disease, death and decay seem to be written on every living thing. While they cannot be eliminated they can be controlled, and the mighty brain of man has wrought out methods and devices for this purpose.

The insect pest of the animal and vegetable kingdom had wrought a mighty loss upon the farm until insecticides were formulated, and spraying and dipping devices were constructed by which they could be applied to animals, trees, seeds and plants, and the loss was stayed.

So the farm without the best formulas for insecticides and the best spraying devices, is not equipped for its business and failure is its doom. Without these aids live stock cannot be reared, orchard and other fruits be grown suitable for market, nor certain vegetables like potatoes, cannot be produced in paying quality or quantity.

CULTIVATION OF CROPS.

The cultivation of farm crops has always been a necessary adjunct to successful agriculture. It

increases in importance the longer our soils are subjected to cultivation. New soils will grow crops with little cultivation, and even the character of the cultivation upon these soils is unimportant. But our older soils have lost their looseness and organic matter content, and moisture holding capacity, and so the cultivation of crops growing upon them becomes a definite science that must be practiced to insure success in crop production.

When the author in his youth cultivated corn upon his father's pioneer farm, planted between the stumps of the newly cleared soil, it did not much matter whether his old double shovel plow with shovels as large as the blade of an old fashioned spade, plowed into the soil a half inch or six inches in depth, for the soil was so loose and full of fertility that it produced a wilderness of corn, no matter whether it was cultivated or not. But that kind of cultivation practiced upon the same land now with the same kind of a cultivator, would prove disastrous to the corn crop.

The successful cultivators for our lands, long subject to cultivation and poorly fed, are those with which we can give shallow and level cultivation, enough to kill weeds and give the one to two inch soil mulch.

We do not emphasize enough the importance of cultivation. We are content if we cultivate our corn and vegetable crops three or four times, which is not enough. There are times, as in periods of droughts, when we should keep the cultivators moving until crops are safe from the onslaught of dry weather.

Orchard or small fruit growing cannot be made a success without constant summer cultivation, yet many orchards are never cultivated.

Wheat is benefited by spring harrowing, which is nothing more than cultivation. Alfalfa growing is likewise made doubly successful by intensive harrowing after each cutting.

CROP ROTATION.

It is constantly being urged that crop rotation is the salvation of the soil and so is one of the greatest aids to the business of farming. And yet crop rotation as practiced in the past has been responsible for nearly all our worn and worn-out soils. In districts where it has been the most practiced we have the greatest area of these soils. Crop Rotation is a gay deceiver. She has cast her alluring smile towards the husbandman, he embraced her, hoping she would restore his sick and dying soils, but she only led him farther into the worn soil "red light district" to be the greater contaminated with its shame and sickening life.

We believe in crop rotation rightly practiced. But it is not a "cure all" for the diseases of the soil. The rotation of corn, oats, wheat and clover, so long practiced in the corn belt, under the belief that it was the right system of farming, and was all that was needed to keep up soil fertility, has driven millions of acres of our best lands into fertility bankruptcy, just as it drove much of our abandoned soils of the East into fertility bankruptcy. It is a system of soil robbery so long practiced along the highway of agriculture that it has become like the vice "to be hated needs but

to be seen; yet seen too oft, familiar with her face, we first endure, then pity, then embrace.”

Crop rotation to be an aid to the business of farming must be supplemented with that farm procedure that provides for the yearly feeding of the soil with an ample supply of plant food. It has failed in the past because it was unaided by this feature of farming. The plant food to be supplied yearly is that found in, or provided by animal and green manuring, and the minerals like potash, phosphorus, limestone, etc.

GROUND LIMESTONE.

The use of ground limestone has become an important factor in soil building and should be applied liberally to our soils. In the limestone regions of the world, if inhabited by a civilized people, you will always find prosperous, sturdy people and great wealth. In these regions the limestone has been disintegrated and distributed through the soil by the processes of nature, which is proof that when applied by man it should be in its raw state ground finely and unburned. Burned limestone becomes caustic lime and so has the power to eat and destroy, and hence will eat up and consume the organic content of our soils, and thus destroy one of the most valuable elements of good soil. The raw ground limestone corrects the acidity of soils, thus neutralizing the acids formed by decay of live organic matter, or in any other manner, thus paving the way for the successful growing of the legumes. The ground limestone can be applied in any quantity without injury to the soil or crops, so the amount to ap-

ply to your soils should be governed by the contents of your pocket book, for even the application of as much as ten tons to the acre would result in no harm but much profit.

RAW ROCK PHOSPHATE, POTASH AND NITRATE OF SODA.

Raw rock phosphate finely ground, of the best quality, applied in amounts from three hundred pounds up to a ton to the acre, and used in connection with animal and green manuring crops, aids much in soil building and fertility maintenance.

Potash and nitrate of soda are also valuable aids.

COMMERCIAL FERTILIZERS.

The marketing and use of commercial fertilizers have risen to an immense volume in the business of farming. While all sections of our country are using it, yet some sections use it in immense quantities. It is a subject that requires the most careful consideration. If it is a valuable aid to the business of farming, then the fact should be universally known that the soil may receive more of its benefits. But if there is no merit in its use, certainly those who are engaged in the business of farming ought to know it, that the great waste of its use be stayed.

We have tried to consider this subject free from bias or prejudice. We do not deal directly or indirectly in any article of trade or commerce proposed as a substitute for commercial fertilizers. We have done much experimenting with it, and have studied everything upon the subject we could



AN EXAMPLE OF THE LAW OF SERVICE.

One of the legumes showing nodules on its roots, the homes of the millions of bacteria whose mission is to render the service of gathering the nitrogen from the air for the use of growing plants, without which they could not live and grow. The greatest law is the law of service. It rules every part and portion of the universe. The mightiest animal, the tiniest insect, and every plant and tree is governed by its rule.

lay our hands upon, and so from an unbiased standpoint have reached the following conclusions.

Too many brands of commercial fertilizers contain as their chief constituent a filler of no fertilizing value whatever. As an illustration, peat taken from swamps is largely used as a filler. Peat is simply rotten vegetation or organic matter unmixed with soil minerals which has reached that stage where it is dead organic matter. It is devoid of bacterial life. It has been arrested in its stages of decomposition before it was worked up into humus. If the vegetation of which it is entirely composed had been mixed with soil minerals at the time or immediately after it was growing, then it would have been a valuable soil constituent, and a fertile soil would have been constructed.

But being dead organic matter it has no fertilizing value when applied to other soils. If applied in large quantities to soil it would have some value as aiding in the conserving of moisture, but it would of itself furnish no plant food. Soils consisting of peat may grow one or two crops when first subjected to cultivation, but attempting to grow crops upon them afterwards is an expensive experiment, as the author has found by personal experience. They can be put through what the laymen of agriculture call a "taming process," by which they eventually can be worked into fairly good soils. This "taming process" is tramping them with live stock, the application to them of rock phosphate, potash, animal manures, and, strange as it may seem, green manuring. We have known muck soils to be greatly benefited with the growing and plowing under of rye upon them.

Now, the using of this peat as filler by manufacturers of commercial fertilizers is a very profitable operation for the fertilizer manufacturer. It is selling this peat at from sixteen to forty dollars per ton and the user applying it in the manner usually applied gets no value in return for its use. Even assuming it has a value, would it not be more economical for the farmer to buy the peat in car or wagon loads and save the immense profit made upon it when sold as commercial fertilizers?

Commercial fertilizers at their best are but soil or crop stimulants. Physicians use certain medicines as stimulants or aids in curing the diseases of men. But they never hope to make a perfect or permanent cure with their use alone. No soil can be built up, or its fertility even maintained, by the use of stimulants. They may be used as valuable aids, but like men, soils must be fed with the food from which real soil tissue can be builded. So the constant use of commercial fertilizers alone makes the soil "poorer and poorer." No permanent system of agriculture can be builded upon the foundation of commercial fertilizers used alone. When honestly compounded, and used with animal and green manuring, we do not condemn their use, but some times wonder whether their constituents can not be obtained for the soil in other ways and at cheaper prices.

NITROGEN.

Nitrogen is one of the three soil elements, the most precious, the most costly, and hence, one of the greatest aids to the business of farming. And yet contradictory as it may seem, it can be secured

for the business cheaper than any other soil food element.

There is three million dollars' worth of it resting upon every acre of our soil and owned by every owner of the soil for the title to your land according to the "law of the land," extends upward as far as you can see, and downward as far as you can dig. This nitrogen is one of the main elements of the air and is available for the use of man, and God in his infinite goodness and wisdom has provided the way and the means by which it can be taken from the air and put into the soil for the use of growing crops and for the benefit of man. The way by which this nitrogen is taken from the air and put into the soil is one of God's mysteries, the unfolding of which to mankind is more interesting than the unfolding of any of his other mysteries of sky, earth, or water, and its study is more entertaining than any entertainment devised by man.

The way is through the legumes—those plants that bear their seeds in a pod, which have upon their roots the little tubercles or nodules, which are nothing more than the cottages, or mansions, or dwelling places of the teaming millions of bacteria that the unaided human eye can not see. This infinitesimal insect life are the busy workers that live lives of service; the service of drawing the nitrogen from the air and working it up for the soil's use, and the use of growing plants. They give service to man, thus exemplifying the wonderful law of service about which we have already written.

And here again the human brain so wonderful

in devising schemes to aid nature in her work of service has furnished the device by which we too can give service to this legume insect life and give another aid to the business of farming. Soils often reach a stage where they are unfavorable for this bacterial life. Soil environments are such that these bacteria can not live and flourish in them and so these conditions must be corrected by the use of the correcting agencies of limestone, manures, etc., about which we have also written.

But when we have corrected those soil conditions the bacteria are not there, they must be secured and moved into their new homes we have prepared for them. We do this either by the transfer of soil largely inhabited by them or by what is known as artificial cultures prepared in laboratories, that is, these bacteria are bred in laboratories and are transferred to seeds which are planted in soils made favorable for these bacteria. These prepared cultures are put up in forms with directions for their application to seeds, which are easily followed and if they are active, and are applied strictly according to directions, and in favorable soil, can be secured for the legumes as successfully as by any other process, as the author knows from actual experience in the field. There have been failures in this method just as there have been and always will be in all lines of farming.

We too often allow the failure we make in the business of farming to overwhelm us. We fail in a crop this year then do not grow it the next when conditions are favorable for its greater suc-

cess. We try an experiment, or plant a new plant, and fail, and then condemn it in the most bitter terms when we ourselves are most likely to blame for the failure. Oh! that we would but remember "that every failure is but a step to success," and "that failure is in a sense, the highway to success."

No matter in what business we may be engaged, we must keep everlastingly at the game if we would succeed. The man that makes a success at farming maps out a plan of crop growing for each year and for a series of years, and follows it closely no matter what the vicissitudes of any season may be, for he knows that if he fails one year he will succeed the next, and that the general average of several seasons will show the profit.

We must needs expect failure in many of our undertakings, but if we are to let this discourage us, we had as well quit before we begin. Every progress that has been made in agriculture or in any other human enterprise, has been made through numerous failures. Failure is the price of success, a motto we must remember if we are to succeed.

THE FALLOW.

The art of fallowing has been regarded as a great aid to the business of farming. To fallow originally meant to plow or till the land through the summer season, without sowing it to any crop. Sinclair said, "By a complete summer fallow, land is rendered tender and mellow. The fallow gives it a better tilth than can be given by a fallow

crop," and Mortimer said, "The plowing of fallows is a benefit to land."

One Roman writer said that the foundation of Roman agriculture was the fallow. But the fallowing as practiced by the Romans meant plowing and constant and thorough tillage during the fallow season, which was indeed valuable and a great aid to the business of farming, but as good results can be obtained by the good plowing and thorough tillage and the planting of a crop. The Roman idea of fallowing was to leave off the crop for a season.

To fallow really means resting the land or allowing land to lie a year or more untilled and unseeded to any crop. It was simply the old notion that land uncropped for a year was resting, although it really was working harder than when growing crops, for when the husbandman turned it over to the supposed rest period, Nature took it in hand and put it to growing weeds. It has never been Nature's purpose that land should rest unless it was in the winter season.

Fallowing as practiced by the plowing and tillage method if continued through a season would likely result in a most wasteful method of farming, especially if the soil had not been deeply plowed and was subject to washing. Heavy rains would seriously damage it. Deep plowing, thorough tillage for a short season, supplemented with the good cover crop, will give the best results to soils, for the cover crop supplements the short fallow with the great advantages of soil covering and added fertility that the cover crop gives to the soil.



RESULTS OF BACTERIA INOCULATION.

The peas on the right were inoculated with artificial cultures, while those on the left were not inoculated. Both grew side by side upon the same character of soil, from same seed planted at the same time. Both bunches have the same number of plant stems.

One Roman agriculture writer was so enthused with the fallowing idea that he even advocated that the lover should allow fallow seasons to intervene in his courtship, an advice not likely to be followed by the ardent loving swain and lassie.

Fallowing, according to the first method mentioned, is perhaps necessary in carrying on dry farming in the semi-arid regions, but in regions of ample rainfall we do not consider it profitable unless combined with a cover or green manuring crop.

THE MOON'S INFLUENCE.

A notion obtains that the moon has an influence on land as well as water and so becomes an aid to the business of farming.

Most of us regard this as mere superstition and say we do not plant our crops in the moon, but in the ground when it has been properly prepared and is in good condition for planting the seed. Yet there are many men who have made an intense study of the moon's influence on land, plants, and other features of farming, and argue if the moon influences the great oceans and causes the ebb and flow of tides, why does it not affect the land?

The following account of the moon's supposed influence given by Samuel Campbell is intensely interesting, although the results named might be accounted for by the influence of other agencies.

"To get the best results: Sow or plant all grain (like wheat, barley, oats, corn, timothy, clover, hemp, flax, and similar things that go to top) in the light of the moon (from new

to full moon). Plant everything that goes to root (like potatoes, beets, turnips, carrots, onions, peanuts, etc.), in the dark of the moon (last quarter before new moon).

"As a test: Say you have a twenty-acre field for wheat; sow one-half in dark of moon, and other half in light of moon. Any man passing along by the field when the grain is ripe, can see the difference in quality and height. The lark sitting on the fence, singing, can see the difference; and should you scare her from her perch she would certainly fly into the tallest grain to hide, which would be that which was planted in the light of the moon.

"I do not mean to say that so doing will insure your crops; seed and soil conditions must likewise be right and seasonable.

"Another test: Dig your post-holes and place fence-posts and nail on your boards in the light of the moon. After a winter's freezing and thawing your fence is tipped to one side and the posts have heaved up, more or less. Again, dig the post-holes in the dark of the moon. Let it freeze and thaw,—your fence-posts remain just where you placed them.

"A third test: Say you are going to shingle shed or house. Shingle one-half of same in the dark of the moon, then finish shingling the other half in the light of the moon. The shingles placed on roof in the dark of the moon will lay flat and smooth; the other half of roof shingled will turn up a little at ends.

"In Sonoma County, Cal., I saw where a man had trimmed two rows of prune trees in the dark of the moon. The tip ends of trimmed limbs died one and a half to two inches back. He pruned the balance of the orchard in the light of the moon, and the limbs healed over on the tips where cut off.

"Again: Place a large two-inch-thick plank, or a large flat sandstone, on your blue-grass lawn in the light of the moon, and let it remain during the summer months. The grass underneath will turn a whitish yellow and continue to live and grow. Place same during the dark of the moon, and let it remain same length of time, and the grass under plank or stone will die, roots and all.

"Let the moon shine upon all kinds of edge tools for a length of time and it will take the temper out.

“Kill a corn-fed hog or kill a corn-fed fat beef in the dark of the moon, and when you come to fry or cook the meat—it goes to grease and shrivels up and is not fit to eat,—dry and no substance in it. Kill same in the light of the moon and you will have nice plump meat.

“From observation I believe that not only the sun and moon, but the planets at certain times when near this earth, have their disturbing effects on all living, growing and maturing nature or animate or inanimate objects.

“All nature must have rest at some time. A man who shaves himself knows how to hone and strop his razor. At times it seems to be dull, and it pulls. Let him lay the razor aside for a length of time; then when he picks it up it shaves easy and he wonders why it is now so sharp. This is nature’s rest. Man and beast, flesh and blood, must have rest. The earth in many localities freezes up in winter time; the rivers and lakes freeze up and all nature is covered with snow; the crops will not grow,—this is nature’s rest.

“The commanders of all ships can buy books a year ahead, giving the serving of the tides at every port; all calculations being made from the moon. If the moon has such an effect upon the great oceans, why shouldn’t it affect the land? It shines upon both land and sea.

“Any man who has the time can demonstrate this to his own satisfaction, and he will find it true.”

When the author read the foregoing account some seven years ago he determined to put the moon’s influence to a test in the planting of eighty acres of garden peas for his canning factory.

The eighty acres was divided into fields and numbered or designated by name, and a careful record of the time of planting was kept. The seed used was uniform and of the best quality, and character of soil was such that a good crop of peas was possible upon each and every part of the entire eighty acres. Upon the different fields peas were planted in all the different stages of the

moon obtaining during the planting season, as the planting season extended over the full period of one month, and planting was begun so as to get the advantage of planting in the light and dark of the moon, and its first quarter, half moon, full moon, last half and last quarter.

The planting came fully up to what was necessary to make a good experiment and growing season was favorable. According to the theory outlined above, the peas planted in the light of the moon should have borne the bumper crop, but when this planting was nearly ready to harvest a severe hail storm swept across the farm, and while the hail did not destroy the vines, yet every pod on the vines had been hit by five or more hail stones, which resulted in the destruction of the crop, as peas never mature when hail stones hit the pods before the peas are ready to harvest.

This storm was peculiar in the respect that there was no hail on either side of the farm, but of course we could not say that the influence of the moon had anything to do with this fact.

Notwithstanding the hail storm damaged the peas planted in the light of the moon, yet it was easy to see that the crop would have been splendid if it had not met with misfortune.

The peas planted at the time of the other stages of the moon also made a good crop. In fine, we could see no difference in the productiveness of the crop upon any of the fields. One planting was as good as the other.

We have planted potatoes both in the light and dark of the moon and never observed any difference, yet we have always made it a rule to plant

potatoes in the dark of the moon, and we plant quite a large acreage every year, and there has never been a year in the past six years but what we had a good crop, and our neighbors' potatoes generally were a failure, although we never observed whether they were planted by the moon. But we have always attributed our success to the fact that we heavily manured our soil with green manures, plowed, cultivated, and sprayed well.

We are not prepared to say that the moon has such influences upon land as well as upon sea which can be utilized as an aid to the business of farming, but the fact that there have been men in all ages of the world's history who, from study, observation, and experiment, have reached the conclusion that it does have such influences, it becomes worthy of some consideration.

IMPROVED FARM MACHINERY.

Improved farm machinery has been a mighty aid to the business of farming as we have shown in the chapter upon the care of farm machinery, but in improved farm machinery there is concealed a peril to the business to which attention must be called. We recently heard a noted farm lecturer declare from the platform that the invention of the reaper has led to the feeding of the world's hungry. But it will also eventually lead to the world's starvation unless the owners of the reaper become soil builders instead of soil destroyers, for, the advent of the reaper has made extensive farming possible upon a larger scale than has ever been known in the world's history, and extensive farming has always led to soil exhaustion.

Extensive farming fosters greed and avarice, and when these sins get possession of the extensive farmer, he drives his soil to the limit of its production of the crops that exhaust the soil of its fertility. He is content with the small profit per acre, and, to fill his coffers, extends his acreage, waxes rich, and though his soil is dying for want of soil food, yet he whips it on to its task of production of the crops he can sell for money.

The invention and use of improved farm machinery will lead to the pillage of the soil unless it be operated by men imbued with the true theory of soil maintenance, so if it does not become the main object of the business of farming to train men along the lines of promoting soil fertility and a permanent agriculture, improved farm machinery in the end availeth nothing.

If it be true as some claim that we have reached the age of the "Dawn of Plenty" on account of the invention and use of improved farm machinery, we can not hope to maintain that delightful state where every man, woman and child go to bed every night fed with enough food to satisfy, unless we maintain the fertility of the soil, for we no longer have the new lands in abundance. The lands that have been farmed for a generation or more must mainly feed us or we perish, and they will never feed us unless they are farmed with different methods than they have been in the past. The method by which they have been farmed has led to the great loss of soil fertility, and if continued, will lead to the complete loss of soil fertility.

If the United States has had a plethora of farm

products in the past it has been because she is a large country possessed of a varied climate and containing a vast amount of new soils stored with enough fertility to last for a number of years. She has never faced a famine as the countries of the old world face them almost yearly. But what will happen when our lands have all been brought into cultivation, and our older lands have been so neglected that they will lose their crop producing power? It would be but repeating history, for the older nations of the world were at one time in their history possessed of an abundance of fertile soils and famine was unknown to them. Even one crop failure in this land of ours would bring us face to face with a famine, because we have no Joseph's Egyptian filled storehouses dotting our land.

It was recently promulgated by our agriculture department that only a small per cent. of our tillable lands were under cultivation. But these statistics were misleading because a large amount of our unoccupied lands can not be successfully tilled, because rainfall is not sufficient upon them for needs of the growing crops, and the problem of irrigating them is impracticable because a sufficient amount of water could not be secured for irrigation projects.

But we have not yet reached the greatest age of perfected farm machinery. The time is right at hand when the small farm tractor, cheap and substantial, will do the plowing and preliminary tillage before seed planting, and the dawn of cultivating implements moved with the motive power of electricity made upon the farms is about to illum-

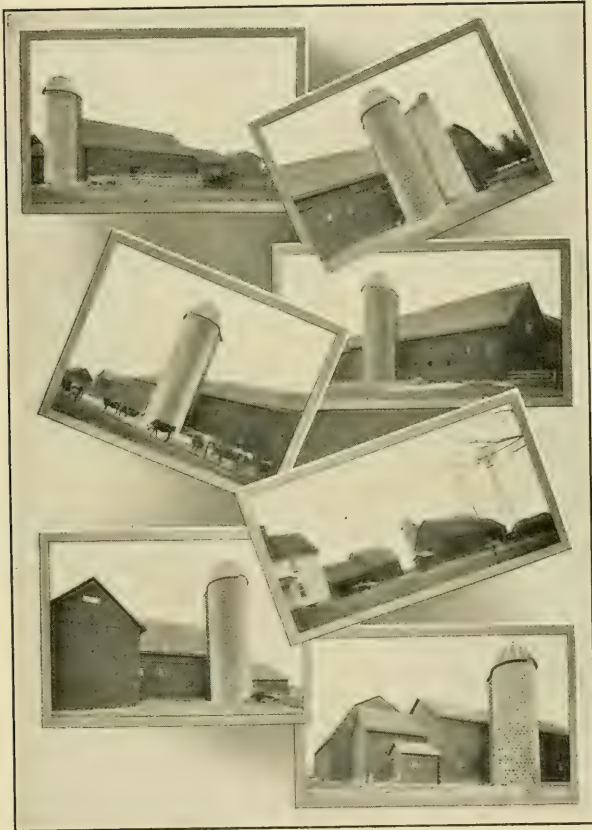
inate the landscapes of the business of farming. An idle dream, do you say? It was so said of the improved harvester and the farm tractor. But the dreams came true and the business of farming was bettered, and the weary toil of binding wheat by hand and following the two horse plow, that drove thousands of us from the farm, is no longer a part of our farm economy. Therefore, for improved farm machinery to be an aid to the business of farming it must be supplemented with wise methods of soil building or fertility maintenance.

THE SILO.

We have already said something about the silo on the farm. When its merits are more fully understood no farm will be without one or more of them.

The best time to feed stock for best results is in the winter season. The cold stimulates their appetites, there is not the insect pest that summer season begets, nor heat to annoy and take off fat. In fine, the winter season is the most favorable time for animal life upon the farm. If this can then be supplemented with feed that is cheap, appetizing, fattening and healthful, which will produce milk in abundance, and which can be procured largely from the utilization of some of the by-products of the farm, at the least labor and can be fed with little labor and waste, we have the ideal combination for successful stock production with its allied products.

All this can be done by the use of the silo. The crop chiefly used for filling the silo is ready for use at a time when there is no rush work to be



THE SILO

The silo rightly constructed is the forerunner of soil fertility, the conservator of the by-products of the farm, the mint that coins live stock into dollars at the minimum labor and expense, and a promoter of scenic beauty of farm home surroundings.
(Courtesy National Fire Proofing Company, Pittsburgh, Pa.)

done upon the farm. It can be put up economically and without exposure to severe weather. It utilizes a by-product, the corn stalk, usually wasted upon the farm. The food the silo makes can be fed with little labor and without waste if proper care is taken in building the silo and in filling same, and this food is ready for use at the most favorable time for feeding.

The silo should be well built upon a most substantial foundation and of the best material. It ought not to be constructed of wood because the wood silo requires care and watchfulness in the summer time to keep it from going to staves, is easily blown over by winds and storms, and requires painting.

The silo should be attractively built, as such a silo adds much to the looks of the farm premises, which we have tried to emphasize as being one of the essential things of the business of farming.

The material for filling the silo should be put into it in the right manner, which is but the simple process of keeping the material level and each layer well packed in all its parts, in the process of filling the silo.

STANDARDIZATION.

Standardization upon the farm means the classifying of the different farm products produced upon the farm with the different classes of quality which may be established by custom and dictation of trade and commerce or general consent.

Wheat, corn, oats and other grains are standardized into classes or grades of quality and the same is true of every farm product. In fixing

the standards of different grades many things are taken into consideration, like appearance, uniformity, mixing of varieties or breeds, moisture content, grading, etc.

While the standardization of farm products may be made a great aid to the business of farming, yet it is too oft made the cloak with which to cover a multitude of sins of dishonest farm produce dealers.

In standardizing corn the moisture content of the corn determines largely the grade to which each particular lot of corn belongs. Often nice appearing corn seemingly free of large amounts of moisture is shipped to distant buyers which is declared to contain so large an amount of moisture as to give it the lowest grade upon which a large reduction in price is made. If the shipper does not have a moisture tester and so does not have his corn tested before shipping, he is at the mercy of the dishonest grain dealer who can give the corn shipped any moisture test he may desire.

Similar conditions of affairs obtain in the shipment of other farm produce, and is one of the menaces of the business of farming that can be eliminated largely by drastic legislation and co-operation of the honest men engaged in the business of buying farm produce.

But notwithstanding we may have the dishonest buyer of farm produce, yet the fact remains that there are still scores of honest men buying farm produce who are constantly on the lookout for quality and standardized farm produce. The day when any kind of farm produce taken to market with utter disregard of quality, attractiveness, or

merit, has passed away. The farmer to be successful in the marketing of his produce must grade it, and brand each grade honestly, and misrepresent nothing.

It should be the aim of every man engaged in the business of farming to do everything that can be done to produce the quality and then grade his produce and sell only the best grades, and as far as possible, utilize his inferior grades upon the farm in the feeding of stock.

“Fancy” produce of all kinds marketed in the most attractive manner as to packages, appearance, or proper handling, always do, and always will command the highest price, and the grower and seller of such products will soon achieve such a reputation that the demand for his produce will exceed his supply.

Standardization enters into everything. There are standards in brains and the man possessed of the best brain in any of the professions and trades is enabled to do his work with the greatest skill and power and so commands the greatest wage. The best merchandise brings the greatest and most profitable price. The best musician, and the author that writes the best book, attract the greatest number of hearers and readers. The best soil is in the best demand at the best price. So the man engaged in the business of farming who produces the finest grains, vegetables, fruits and farm animals, though he live the farthest removed from market will always find the buyer willing to pay the price, wending his way through inferior unstandardized farm produce to his doorway.

It is waste of time, energy and money, to work for better markets safeguarded from dishonest dealers, until we first standardize farm produce, for when we accomplish standardization we have more than half won the fight for the best safeguarded markets. When the farmer begins to standardize his products he becomes the true and honest tiller of the soil, for he soon learns that he can not successfully standardize his produce, unless he installs upon his farm the methods of fertilization, tillage, protection from insect pest and the like, by which standardization is brought to its highest perfection. So standardization means greater farm efficiency, more scientific farming, and the greater uplift of the business.



A FARM BY-PRODUCT TOO LONG WASTED AND DESTROYED UPON
AMERICAN FARMS.

The business way is to conserve them, either in the silo or by plowing them under to furnish organic matter and food for plants and humus for the soil. There can be no scientific efficiency upon the farm unless waste is stayed.

CHAPTER XIII

THE BY-PRODUCTS OF THE FARM AND THEIR UTILIZATION IN A BUSINESS WAY

THE Standard Oil Company did not begin to wax rich until it solved the question of turning its by-products into those numerous useful articles of trade from which it has received untold wealth. In its early history in the production of its chief product, coal oil, there was an additional or by-product produced that was thought to be without value. It was a great waste. Human ingenuity set about to conserve this waste and discovered the great wealth that lie within it, and gasoline, paraffine, in fine, two hundred chemical factors, were produced from it and its by-products are worth more than the oil itself. The company can pour its coal oil into the sewer and yet pay large dividends on its stock. Is it any wonder that the Standard Oil Company became the richest corporation the world has ever known?

For years the mills ground the farmer's wheat, and dumped the brand, the wheat's by-product, into the river, regarding it a useless thing. Now it is worth more per pound than the flour, it being richer in food value both for man and beast.

Ever since the cotton has been subjected to man's use, until a few years ago, its seeds had been regarded of no value other than for planting, and

there being of them so great a surplus, their disposition became a nuisance. Now there are produced from them oil, fertilizer, cottolene and meal for cattle, and they have become as valuable as the cotton itself.

There is not a manufacturing plant to-day but what directs its greatest energy towards the conservation and utilization of its by-products, for herein lies its greatest profits.

But the by-products of the farm have been neglected and destroyed through all the ages, and thus untold wealth has been utterly wasted upon farms. In the destruction of cornstalks, a by-product of the farm looked upon generally as a farm nuisance, there has been more wealth destroyed than ever possessed by the Standard Oil Company.

The utilization of the cornstalks for one year in siloes would produce succulent food sufficient to feed cattle and other stock that would produce a profit great enough to almost pay the National debt, besides furnishing another by-product, manure, that would furnish fertility to the soil sufficient to produce such increased crop yields that would feed the people of our nation. Besides no one can estimate the untold wealth that would have been conserved to the farmers of America had our stock fields been held as sacred ground, too sacred to allow a foot of them to be pastured, or a single stalk to be burned, so that all the stalks upon our corn fields might be incorporated with the soil by proper plowing under, thus preserving the great quantities of nitrogen, phosphorus, potassium and organic matter they contain. In the

seemingly harmless and much advocated thing of pasturing stalks, the greatest injury has been done to the farms of the corn belt, an injury in dollars and cents, beyond the power of computation. The farmer in his mad desire to obtain a little feed (and we say little advisedly) for his stock with the least labor, has turned them upon his stalk fields in those seasons of the year when the ground is wet, muddy, freezing and thawing, and when the soil should be covered if we wish to preserve its fertility. The tramping of his stock upon his soil has crushed out its life blood, its fertility. And then to further intensify the infamy heaped upon the soil, every remaining stalk not eaten or destroyed by the cattle, has been raked up and burned with fire. And yet we hear promulgated from the highest recognized authority, even by some of our best agricultural journals, that since the farmer has his fields fenced, there is no reason why his animals should not gather their own food from the stalk fields, and that not to pasture them is to let them go to waste. And such has been the practice in the corn belt for years. And the corn belt farms are fast losing their fertility, and the bulk of their best by-products are utilized in such a manner as not only leads to their waste, but to the destruction of our farms' best resource, the fertility of the soil.

Now, we are combating a system which has been practiced for generations, that has become a fixed habit with the corn belt farmers, and it will require hard licks and knock-down arguments to disenthroned it from the mind of the farmer set in his old ways.

In the first place it is universally acknowledged that our soils are fast losing their fertility, and why? Because we have simply farmed from the soil the supplies of organic matter needed to give it the proper ventilation, looseness, moisture-holding capacity, and to make it a favorable home for soil bacteria, and to contain sufficient supplies of plant food. Our soils are becoming hard and compact. They run together easily and become like sun-baked bricks.

Now, with the soils of our corn fields in this condition, a man with any sense of observation can readily see what will happen to such fields if cattle are turned in upon them in the fall, winter or spring of the year, to tramp and to puddle their soils. It will not do to say that if the ground is frozen their tramping will not injure the soil, for, as a rule, the ground is not frozen at all times and nine-tenths of the farmers are utterly oblivious of soil conditions of their fields when pasturing their stalk fields. Yet we hear it said, "Take the chances and eat up the stalks, the damage will not equal the loss of feed if you allow the stalks to go unpastured."

But let us reason together and ask ourselves the question, "If we are to build up our soils to that state where they will give adequate return for their cultivation, what is the business way of handling our by-product, the cornstalk?"

The cornstalk has great feeding value, and yet little of it can be eaten by stock when fed as crude fodder. There is but one way in which the entire cornstalk can be treated and prepared into palatable food, and that is to silo it. In future ages it

will be said that the restoration of the fertility of our soils began when the silo was invented, for the silo upon the farm changes our methods of feeding stock. It takes them from our stock fields and puts them into the feed lot where their manure may be conserved and applied to the soil in the most effective manner.

The well organized manufacturing plant will employ every means within its power to utilize its entire by-product. To utilize but a portion of it would be regarded poor business policy. But a farmer will erect one silo which will not utilize one-tenth part of his corn crop, then he will gather the balance of his corn and waste the cornstalks upon which it grew.

Of course the author is aware that it would not be practicable or even possible in every case to silo the entire corn crop on our farms, but a greater amount siloed means more stock upon our farms and a greater fertility for our farms, and the greater fertility means a larger crop yield, and a larger crop yield means more money for the farmer and more food for our people. If, then, it is impractical to silo the entire corn crop, and thus in the best possible manner conserve the by-product, the cornstalk, what method are we to pursue so that the cornstalks of that portion of our stalks not siloed, may be conserved? Some of it may be needed in the form of crude fodder to furnish the needed roughage required in properly feeding stock when using silage. But there is but one way of utilizing that portion of the cornstalks left in the fields after their harvests of corn have been garnered, and that is to take the roller

immediately after gathering the corn, roll them down flat to the ground, then drive out of the gate in the fence surrounding them, lock the gate securely with padlock, lose the key and forget where you placed the hammer or ax until time for spring plowing.

If in this method of treatment you but add the proper cover crop planted or sown among these cornstalks at the proper season of the year, then you will indeed be upon the right road leading to soil conservation.

Of course the covetous and greedy farmer, without capacity for looking ahead or solving the problem of the soil's fertility will look over the fence and say in his heart, "Oh, what a waste of feed." And in the spring time, the farmer set in the ways of farming of his ancestors will be impatient to tear down the gate and get into the field that he may rake up and destroy with fire that precious wealth of organic matter and fertility contained in those stalks. But that farmer who farms with his brains, as well as with his hands, seeing the soil's need and its requirements, will find the lost key, unlock the gate at a time when the soil is in the right condition for plowing, and with sufficient power hitched to a properly equipped plow, will drive into the field, and in a scientific and businesslike manner proceed to plow under a sufficient depth those cornstalks and cover crop, which have been covering the soil during the winter months conserving soil fertility, thus incorporating them with the soil so that the soil bacteria will be able to attack them and work them up into plant food, and into those other elements that contribute to

the soil's fertility. So this farmer will thus be feeding the land as he feeds his cattle, and the soil will be as responsive to its good treatment as his cattle are responsive to their good treatment, and they each will wax fat and pour their wealth into the hands of this farmer.

For years the author has denounced the insane method of pasturing and burning cornstalks. He calls these methods of utilizing this by-product of the farm insane because they lead to such a criminal waste of soil fertility, for which our soils are pleading as shown by their waning crop growth and productiveness. And this is not theory with the author. He has for years practiced the method of not pasturing the stalks and plowing them under upon lands adjoining the same character of lands where the system of pasturing and burning was practiced, and the results in favor of the author's method have been so marked that it has led him to denounce the old method of pasturing and burning, which he will continue to do with all his might and power.

There may be other methods of conserving this by-product that have merit, as for instance, a process has been discovered by which paper can be made from cornstalks. The stalks are beaten and fanned to remove the dirt from them. They are then cut into pieces and steeped in water and shredded into fiber in a special machine. This shredded material is then boiled in diluted acetic acid under air pressure which results in a product of which one per cent. to eighteen per cent. is an alkaline solution and yields large quantities of excellent paper fiber, leaving a residue which may be

utilized as food for stock or from which a fair quantity of cane sugar can be procured.

Now, the author can see no objection to the utilization of the cornstalk into paper making, provided our soils are supplied with organic matter from some source other than the cornstalks. Otherwise the cornstalk should never be destroyed by fire or taken from the farm. We must not get away from the living truth that our soils' sorest need is organic matter. Certain death and decay is written upon their every fiber if organic matter in abundance is not each year restored to them. But in the removal of the cornstalk from the farm we are not wholly without a substitute from which vast quantities of organic matter can be quickly obtained. If, when we lay by our corn fields we would sow them to rye or vetch, we would not only give these soils the finest cover crop, but would give to them before plowing time the following spring more organic matter than the cornstalks would afford. But do not forget that these cornstalks removed from the farm, remove a large quantity of the mineral elements they extract from the soil in their growth, which will be forever lost to the soil, and mineral elements that soil must have to make it fertile.

The utilization of cornstalks by shredding is to be commended although this method does not furnish one-half the feed that is furnished by the silo, yet it prevents the waste of the cornstalks, because those portions of the shredded stalks not eaten, and which can not be eaten by stock, may be utilized in bedding for stock, and is thus conserved into manure. And as these shredded

stalks soak up the liquid portions of the manure, it saves the most valuable part of the manure which is generally wasted. This method of handling the cornstalks not only results in a saving of 24 per cent. of the fodder, when handled by the old methods, but is also labor saving, as the shredder husks the ears of corn. Fodder can be shredded at an average cost of \$2.25 per acre. The part that is eaten is as valuable as timothy hay. It affords the proper and necessary roughage for stock, and if shredded in the right condition, preserves fodder in a better and more economical manner than when handled in the old way. This system, next to putting the corn into the silo, should be commended in the highest terms, because like siloing, the entire cornstalk is conserved to the farmer's great profit, especially in view of the fact that so much of it gets back to the soil to supply it with the precious organic matter.

It is universally conceded that the salvation of our worn and worn-out soils is the application to them of stores of organic matter; that the two best sources from which organic matter can be obtained is manure and green manuring crops; that the most valuable is manure; that sufficient supplies of manure cannot be obtained under the present system of management of our farms, because they do not feed sufficient stock. It is also conceded that the feeding of stock upon our farms, aside from the manure they furnish, is a most profitable business; that by feeding stock the grain, grasses and other feed materials grown upon the farm, we obtain the maximum prices for our farm products grown for stock feeding. The

combination, then, that produces stock whose increase in fat brings the farmer a rich profit, and the feeding of which gives him a maximum price for the farm products he feeds them, combined with a system of conserving into a rich and palatable food the by-product of the farm, the corn-stalk, ought to spur the farmer to such effort that he will not simply be content to conserve a part of this by-product, but will so equip his farm that every part and portion of this by-product will be conserved into that profit making food, that not only causes his cattle to wax fat and grow into riches, but which also results in the production of another by-product, the most valuable to the farm, which, if it can be produced to the farm in large quantities, would almost solve the question of maintaining soil fertility.

The modern manufacturing plant that would not conserve and utilize each and every portion of a valuable by-product, would be looked upon as being a plant twenty years behind the times. And what is the farm but a modern manufacturing plant that manufactures human and animal food stuffs? And why should it not conserve and utilize every portion of its by-products as well as the most modern conducted business establishment?

In the hauling of corn to market the farmer of course receives pay for corn cobs, receiving the same price per pound for them as he does for his corn. But it occurs to the author that here is a by-product that can be utilized in another and to a greater profit for the farmer. Every farmer in this day is or should be equipped with a gasoline engine. Corn shellers are cheap and can be oper-

ated with the average gasoline engine. Shelled corn well cleaned should command a price equal to the corn sold on the cob, and would in this manner afford the farmer the same profit and leave him the cobs, costing the labor and expense of shelling which would not be large. Most all farms have their feed mills, or they can be purchased at a cheap price, which too are operated by gasoline power. These mills will grind up cobs into a fine matter that can be utilized for feed, bedding or manure, or, as has recently been discovered, can be with little trouble and skill mixed with cement and molded into the best of lumber. But if the cobs were ground and returned to the soil, the farmer would receive five times the value by such utilization than he receives from the purchase and use of commercial fertilizers, and he would save to his soils the valuable soil minerals contained in them. No manufacturing plants would despise such a utilization of its by-products. It would ever be on the alert to find them.

Much care should be exercised in the utilization of straw upon the farm, and it should never be sold from any farm unless animal or green manuring crops are substituted in its place. Its main uses are for bedding and roughage for stock, and is thus converted, not only into animal profit making fat, but into another by-product, manure. Utilized thus, greater profit is secured than in its sale.

The successful orchardman is ever on the alert to work up into profit his by-products of unsalable fruit. They are used into cider, vinegar, feed, etc.

China, Germany, and many other old countries

have been driven by necessity to utilize every by-product of the soil or farm. They construct their compost heaps into which are thrown every weed, straw, vine, top of vegetable, shuck or manure. Not a single bit of organic matter, no matter what its kind or character, is wasted, but is carefully garnered and thrown into the compost heap to be converted into manure or fertilizing matter with which to compensate the soil for its production of crops.

The majority of farmers in America have not as yet been driven to that necessity, but the author ventures the prophecy that unless our soil wasting be stayed, that very thing, and at no distant day, will become an important part of our farm economy.

The successful Roman farmer even plowed under his stubble as soon as the crops were removed that it might not dry out and take the moisture from the soil, and lose much of its fertilizing value. It is the practice of the American farmer to let the stubble become dry and then burn it.

Many of us have not even begun the study of the best methods of utilizing or conserving the by-products of the farm, and too few of us are putting them into practice, even when we have learned them.

The successful farmer of the future is the one who will carefully study out and put into execution methods by which every by-product of the farm will be consumed and utilized to the best advantage.

When this has become the common practice upon

every portion of our soil, then our worn and worn-out lands will have become a memory and the profits of the business of farming will be worth while.

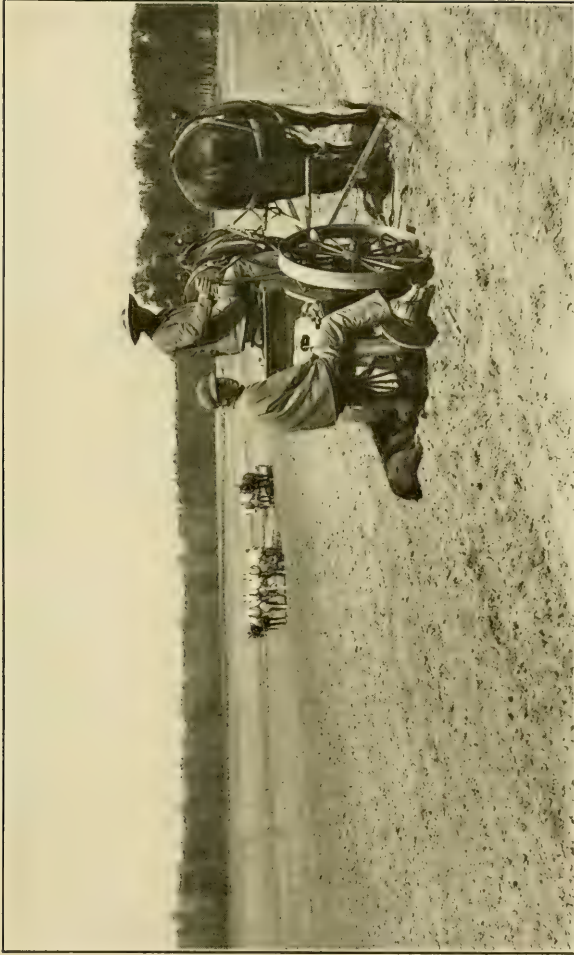
CHAPTER XIV

CARE OF FARM MACHINERY

WE are living in the most advanced age of machinery. Never before in the history of the world has machinery been applied to the doing of man's work as now. Man has made perfected machines that do his work with greater skill than ever he possessed. This perfected machinery has permeated every industry, and now becomes necessary to the perfection of efficiency so that products may be produced at lowest possible cost.

Perfected machinery for all branches of the business of farming has been developed to that stage that it has solved much of the labor problems of the business, and makes farm labor a lighter burden than it has ever been in the history of the business. The day of brawn upon the farm has been succeeded by the day of lessened labor and shorter hours of labor. Perfected farm machinery has been the magic wand that has touched the old farm labor conditions, and brought forth the period of greater efficiency accomplished by lightened labor under more pleasant and agreeable conditions, yet we must still take into consideration depreciation of farm machinery in figuring the cost of producing our farm products.

The manufacturing plant that does not figure



GOOD FARM MACHINERY IN USE UPON WELL PREPARED SOIL FOR THE SEED BED.

depreciation in all its phases as a part of the cost of its finished products will learn to its distress that it is playing a losing game. It is therefore a business proposition to reduce depreciation to a minimum. This can only be done with machinery by taking the proper care of it.

It is often found necessary to replace machinery with the new and improved machinery that so increases efficiency that it makes it no longer economical to use the old. But the machinery that has not been displaced with the new and improved machinery, as well as the new, should be preserved and cared for in the most approved manner.

In every business we find a great neglect in the caring for machinery, but it seems to the author that those who are engaged in the business of farming show greater neglect of their machinery than in any other business. The cause of this certainly cannot be attributed to downright laziness. There must be another reason for it. We are inclined to believe it is due to thoughtlessness caused by want of knowledge of the importance of proper caring for machinery, or for lack of capital to provide ways and means for caring for machinery. We firmly believe that if every one engaged in the business of farming had the necessary capital to construct the proper sheds or buildings in which to care for his farm machinery, we would not now see conditions that obtain upon most all our farms in respect to the care of machinery.

No farm is really and truly equipped for business unless it not only has sufficient sheds and buildings in which to house its machinery, but also

has its workshop with heating facilities so that in the winter season repairs can be made to machinery.

But few of us properly care for our plows and cultivators. When through with them for the day or season, instead of applying to the moldboard points and shovels, oil or grease in the form of paste, we allow them to be exposed to weather conditions which bring on the rust that prevents scouring, and causes the irritating annoyances and improper plowing or cultivation. And often when we put away our machinery in our ample sheds we forget that dampness and rust will permeate into those sheds the same as though exposed to weather conditions, and so forget the application of grease and paint that will protect and preserve from these troubles.

There is joy and pleasure in working with the good piece of farm machinery in our fields if it be in perfect condition in all its parts, for in this condition it does its work well. Much of the neglect to care for farm machines is occasioned by the same force that causes neglect of farm fences, buildings, farm surroundings generally, neglect of soil, etc. It is the spirit of neglect that fastens itself upon the lives of men in every branch of trade or business. This spirit is chiefly brought about by discouragements, discontent with our lot, dreaming for things beyond our stations, lack of ability, and often to laziness.

We have already shown the force of discouragement upon the lives and habits of men. If we could but get in tune with our business and be given the vision of its wonderful possibilities,

every farm neglect would be soon eliminated. Read again our chapter on the Discouragements and Vicissitudes of the Business of Farming, and especially our chapter upon the Profits of the Business of Farming, and see if you cannot get the spirit and vision of that work that gets you interested in every detail of your business, for if you can catch the true spirit of work and make it a part of your being, then you will cheerfully go forth and strive to eliminate from your business the spirit of neglect that is swallowing up your profits in waste, and which also is spreading the spirit of discontent of farm life among your families.

The most successful men in the business world have been the men who were ever alert and so interested in their business that they attended carefully to its every detail, and in the doing of this they found that waste was the most serious foe to their business, and that its elimination meant increased profits, and when they saw this they did not procrastinate but acted.

We must eliminate the waste of neglect from our farms, not only for profit, but for the uplift of our families, and to increase our love for our business. If it requires capital to do it, let us put forth every effort to secure it for the returns will soon pay the borrowed capital. If energy and work only is the requisite needed, then let us quit our dreaming and get busy. Get in the game of your business and play it like the true sport or quit the business. Too many of us are simply drifting, and the drifting man always neglects his business and fails to safeguard it by the elimina-

tion of waste. If by the proper care of farm machinery we can double its period of activity, we have added much to our profits. Under the conditions that now obtain upon the average farm with reference to the care of farm machinery its life is reduced nearly one-half for want of proper care. It is one of the great wastes of the business that eats heavily into the profits, and yet is a waste that can so easily be eliminated. It requires no set rules to eliminate this waste from the farm. Just simply get busy and do it like John Sherman told how to resume specie payments, "Just resume."



"THE MORTGAGE LIFTER."

To make livestock pay, we must have the best and most productive breeds, an abundance of the right kind of forage and other feed, the bulk of which must be produced upon the farm, and men who will faithfully attend to every detail in the care, feeding and conservation of the health of each animal, doing the same with kindness and gentleness.

(Photo by courtesy of Frank Weisenbaum, Assumption, Illinois, breeder of Hampshire Hogs.)

CHAPTER XV

THE IMPORTANCE OF LIVE STOCK IN THE BUSINESS OF FARMING

WE hear much about feeding more stock on the farm. That there is much profit in so doing is an established fact. More money is secured for the grain and forage fed than if it was hauled to market, and the by-product, manure, produced by this method is valuable, as it enables the farmer to maintain and increase the fertility of much of his farm. But those who so enthusiastically advocate this method of farm procedure, forget the fact that to do this on most any farm, requires considerable capital, which many farmers, especially renters, cannot secure.

Again, not every farm is adapted to this purpose, for to successfully follow the procedure, the farm must have an abundance of water furnished either by springs, running streams, or pumped from wells. To pump water from wells means a considerable expense. There must also be plenty of shade, pasture or forage crops in abundance every month of the spring, summer, and fall seasons, and plenty of feed and shelter in the winter season. And the farmer who follows this method must also have such a love for stock that he will give it the best care, which means that he must be possessed of patience, a love for details and a

disposition to give almost his whole time to their attention and care, for they cannot be kept in health and brought to a good marketable stage without it. He must also be possessed of that kindly disposition which enables one to treat stock with kindness and gentleness, for animals resent harsh treatment as much as man. When we consider the fact that upon the farms of the United States there are twenty-five millions of horses and mules, the cost of feeding which, annually, is about two billions of dollars, and that it takes one-third of the hay and corn grown on the average farm to feed the horses or mules required to cultivate and care for the farm, it can be seen at a glance that to keep much of the stock upon the farm in addition to horses and mules necessary to run it, means that the farm must grow more grain and forage than is now produced upon the average farm.

Few farms have a large acreage of blue grass pasture, and even if they had, it could not be depended upon in the dry seasons.

It is probably designed by Nature that we should not all be stock farmers, for if we were, from whence would come the grain to feed the world, and the hay and other feed stuffs which feed the animals of those who do not farm?

Somebody must be grain farmers, that is, farmers who grow and sell all the products of the farm, only reserving enough to feed the stock required to carry on their farm operations and to furnish food for themselves. As nearly three-fourths of the farmers of the United States are grain farmers, and probably always will be, for

grain farming has generally been profitable and will be if farm fertility is kept up, and as many do not have and cannot secure the capital requisite, and do not have the capacity for raising and caring for stock, the business of grain farming will continue to occupy the attention of the vast majority of our farmers.

Most any farm can be fitted and so managed that much stock can be fed to a profit, even though it have none of the natural advantages for so doing.

First, we must get away from the idea that a large acreage of pasture lands is necessary. The most successful stock feeders of our own and foreign countries get best results from lot feeding, and this method does not require large pasture acreage. The essential thing is shelter from inclement weather and excessive sunlight, and it does not always mean expensive buildings to secure these protections. A simple shed of poles, rails, and straw, will make shelters that protect from cold, sleet, rain, or fierce summer heat, and make comfortable places for stock even in the winter seasons. If commodious, sanitary equipped buildings can be erected, so much the better, but the worst failures in stock raising the author has ever seen were those of farmers who had the most expensive and best equipped building facilities for the caring of stock. Simply constructed sheds of poles, rails and straw, erected where drainage is perfect, will give as good results in the care of stock as the most expensive and elaborate stock barns, and like every other business the success of producing live stock de-

pends upon the man behind the business. The main things are the right breeds of stock, the feed, the feeding, the sanitation and the care bestowed, and the production of these essentials depends upon the man.

The most important thing is the production of an abundance of the right kind of food. The food generally relied upon on the average farm is corn, timothy and clover hay, and a forage of blue grass and clover. To depend upon these in this day and generation would mean that upon the average farm there would be little stock produced at a profit, so we must get away from this idea of producing feeds for stock.

The trouble with most farmers is that they are impregnated with the idea that blue grass, timothy, clover and matured corn are the only feeds. The folly of depending upon these feeds for extensive stock raising upon the average farm is apparent if we but lay aside our prejudices and study carefully the situation.

Blue grass is fine for the season it lasts, but it is susceptible to drouth, does not grow in abundance except upon our best cultivated lands. Occasionally we find waste woodland or lands not susceptible of cultivation that produce fairly good pasture of blue grass, but such conditions are rarely found. If lands are at all susceptible of cultivation, other forage crops can be grown upon them more abundantly and at greater profit.

Timothy produces but one crop a season, and generally not in abundance unless the land upon which it is grown is extra fertile. On average lands its output is less than a ton to the acre,



THE MORE ELABORATE EXPENSIVE HOG HOUSE WITH CEMENT FLOOR.

In the author's judgment it is questionable whether such a shed is as sanitary or is any better fitted for the brood sow than the simple inexpensive house elsewhere shown. However, the chief advantage of such a house is that it takes less labor to care for and feed a greater number of breeders.

which, for its feeding value, is a most unprofitable crop, and especially in view of the fact that it is a crop that has done and is doing more to produce worn and worn-out lands than any crop ever grown upon the farm. Clover ranks well, but there are better and more profitable forage crops. A fine forage crop for cattle, sheep, or horses is hungarian. It produces its large crops of high feeding qualities in eight weeks, and can be sown upon wheat lands after wheat harvest, and after its harvest the soil can be sown to rye or other green manuring and cover crops, which can be pastured in the fall or left to cover the ground and to be plowed under in the spring, thus procuring several crops the same season and yet providing for an excellent method of farm procedure by which soil fertility can be maintained.

Sorghum is another most valuable forage crop of rich feeding value which can be quickly grown, producing tons of forage to the acre, and will so grow on most any soil, and will as soon as cut immediately grow a second crop which can be used for forage, or, a better plan is to use it as a green manuring crop for plowing under, for sorghum is valuable for this purpose.

Kafir, a forage plant of the species of sorghum, and like unto corn, is most valuable as it flourishes at its best in the semi-arid or dry regions. Nature has endowed this plant with a virtue worth millions to the business of farming. That virtue is the plant's ability to cease growth and lie dormant without injury during periods of drouth and to resume its growth when rains come to refresh it. It also has the power to produce the

second and even third crop. Its feeding power while not as high as that of corn, is most valuable, and as feed it is suitable for all kinds of stock, and in some parts of the world is used for human food.

Cow peas, friend of worn-out soils, which takes so kindly to its soil feeding powers that it will grow it in abundance, is a forage plant of such high feeding powers, and produces in such quantity, that it should be grown upon every farm that feeds stock in any quantity, even by the grain farmer for the stock that he needs in his farm operations.

There are other forage plants worthy of trial which have proved their value for feeding stock, like rape for hogs, and the millets and vetches for cattle.

But in making a selection of forage plants the farmer must, to be successful, consider those plants which give the greatest feeding value and the plants that will produce the largest quantity of forage at the least expense, both for growing and harvesting.

Corn is a staple and perhaps a necessity in stock raising and always will be, although it can not be depended upon alone, but it is one of the most valuable of feeds for stock if siloed.

There is another forage plant whose value has not yet been fully appreciated and realized by the stock raisers of our country, and that is alfalfa, "the everlasting and best fodder," transformer of Kansas farmers into Nabobs, the mint that coins pork into dollars, possessing the alchemic art of transmuting worn-out soil into "pay dirt,"

and one of the two plants that is worth more to our agricultural economy than any grain, grass or forage plant grown upon the American farm. Valuable because it can be made to grow luxuriantly upon nine-tenths of our soils, producing in almost any portion of our country three bumper crops of hay, and in many places four or five crops each season, and for a long period of years, its feeding value equal, pound for pound, to bran (the richest in food value of any stock food known), and not equaled by any forage plant known to agriculture. Besides it is a plant that has concealed in its juices the health giving elixir for the animal that eats it.

Alfalfa pastured by, or fed as hay to hogs, together with a ration of corn, constitutes the cheapest and most perfectly balanced ration, and the ideal winter ration for brood sows.

It possesses another characteristic that seems to have been overlooked by alfalfa writers, and that is the easy and cheap manner in which it can be prepared and made ready for feeding. No necessity to resort to the expense and labor of putting it in silos, or chopping it up and mixing with other feeds. If the alfalfa field is well established turn the stock into it in the summer time and pasture it judiciously, which means not to over pasture, and clip with mower the same as if cut for hay. The hay can be at any season of the year thrown into the manger and feeding racks to horses, cattle, sheep, hogs, and it will be eaten with relish, and to the great profit of the farmer.

Within the lifetime of the author, and in the region where he has resided, there sprang up in

great profusion along the roadsides and upon the waste unproductive soils, a plant immediately denounced by the people generally as a most serious weed pest. There was mystery in its origin, for no one knew from whence it came. In alarm the farmer said it would invade and devastate his cultivated fields, yet it never did take hold upon the rich or fairly rich cultivated or uncultivated lands, but upon the poorest, stoniest, and driest waste places, road sides and commons, it flourished and grew to great size, no matter what the character of the growing season might be.

This seeming weed pest was but one of the powerful soil restoring working forces that Nature so kindly sets before the owners of worn and worn-out soil for restoring soil fertility. It was one of her mute offers of help to our burdened soils, and though soil owners spurned the proffered help, Nature was persistent. When the soil owner would with fury strike down the seeming pest with mower and scythe, Nature made it grow more luxuriantly than ever before, and further emphasized one of its valuable characteristics. The persistence of Nature in making the plant flourish under the sternest opposition and environment, no doubt led some one out in thought and investigation, for somebody saw the virtues and uses of the plant, and it was discovered that Nature was bringing to the very feet of the farmer, a plant whose soil restoring and fertility maintaining powers and feeding value is not equaled by any plant grown, or human agency devised by man. Thus the despised and rejected sweet clover plant is not only about to become a corner stone



THE SIMPLE CHEAP "HOG HOUSE" FOR THE BROOD SOW.

As suitable for the purpose as the most elaborate and expensive sheds, with the exception that such housing requires more labor to feed when a large number of breeders are kept.

(Photo furnished by the courtesy of A. F. Shaw, Carmel, Ind., breeder of Poland China Swine.)

of a permanent agriculture in this land of ours, but a most valuable forage plant. Valuable as a forage plant because it will make an enormous growth and harvest upon our poorest lands, thus making stock farming profitable where before it was a positive failure, because not enough feed could be produced to profitably feed stock.

To those who are ever proclaiming that to build up our worn and worn-out soils, or to maintain soil fertility, the farmers of our country must become live stock farmers and grow and produce more live stock upon the farm, the author would remind, that the manure from the stock raised upon the farms of the United States would not cover one-tenth of our farm lands. What is to become of the other nine-tenths? If all the farms would go into the live stock business to any great extent, from whence would they get their supplies of stock with which to commence business? And we have shown that manure is not needed to build up our soils or to maintain their fertility.

Again we should remember as one has well said, "We do not live by meat alone." Bread is the basis of the food of the world, and it takes the grains to make bread, and the remaining items of diet almost as important as meat are the vegetables and the fruit, all produced upon the farms.

Our dispositions and tastes are such that not all of us would succeed as producers of meat, grain, vegetables, and fruit collectively. Some of us delight in live stock raising, and so make a success of this business. Some of us are more successful in the other single lines of the business of farming, and so writers and speakers in considering

these things should not forget the true conditions that obtain, and always will obtain in the agricultural world, and, therefore, not advocate the doing of impossible things.

We find conditions obtaining upon the farm that can not be changed, but they can be improved to the advantage of the great business of farming, and therefore to the advantage of the people in general. For instance, if conditions are such that live stock farming can not be engaged in by every farmer, then the condition that necessarily follows the lot of those who engage in grain farming, who do not secure enough manure to keep up and maintain the fertility of the farm, can be so changed that they can follow a system of green manuring by which bumper crops can be grown, and farm fertility can not only be increased but maintained.

The alarm has been sounded that a serious shortage of the meat supply threatens our nation. The breaking up of the western ranges has had much to do with this shortage, and if it be true as some claim, that "rich red juicy beef" is necessary to put the virile force into the American people, then this apparent meat shortage indeed becomes a serious menace to our people, and requires that something be done to remedy the condition of meat shortage.

Many and varied are the remedies suggested. Among them being that "every farmer should raise at least two beef steers a year to offset the decreased production of the ranges." "The remaining ranges should be cut up into farms." "Development of the hills of New England, with their bountiful springs and prevailing shade."

“Substitution of corn for cotton in the southern states, and the consequent development of cattle and hog production.”

Of course it is up to the farmer to produce more meat, but he will never do it unless he can be shown that there is money in the proposition. The way the average farm has been managed as to the production of feeds has led away from, rather than to, stock upon our farms, for the production of crops upon these farms has been such that it was necessary that the average farmer should sell all his grain and feed stuff grown, other than what was necessary to feed his stock necessary to conduct farm operations, in order that he might live. The average farmer did not have a large acreage of native grasses, and if he did, they would not be available at all seasons on account of drouth, and those grown, like alfalfa, that produced their several crops each season, or those other grasses that produced enormous crops, were not grown. Dependence was put upon timothy and clover, which never, except under the most favorable conditions of weather and soil fertility, produced in abundance. The silo was unknown and so the average farm as a meat producer has been of little consequence, and to make it a producer now, an entire change in the methods of farming must be put into effect upon these farms.

The question of a better meat supply will never be solved upon the average farm so long as the average farm will not grow more than enough clover, timothy, or grass to support one steer to the acre. But it will be solved when the owner of our average farms begins to grow such forage

plants as alfalfa, sweet clover, sorghum, soy beans, cow peas, kafir, and erect the silo for the better utilization of corn and cornstalks, a by-product heretofore wasted and destroyed. For when these methods of farm procedure obtain upon our farms, then the production of live stock becomes a most profitable business, and farmers will engage in it because there is money in the business of stock raising under such conditions. When farm prejudices are broken down and the farmer can be made to see that by a certain line of procedure money can be made out of stock raising, then he will engage in it to the extent of his capital, and here we must realize that while it is an established fact that the successful farming operations have for their corner-stone a large number of animals used for human food, yet to do even this requires capital to buy or raise the animals, to secure and maintain proper equipment for their care, and the securing of their feed in the most economical manner. And to find so large a number of farms without their proper quota of live stock, is because their owners lack sufficient capital and are not in position to secure the same, and their farms are not so farmed that feed for stock is produced in sufficient amount to feed any quantity of stock, for we must remember that it takes twelve pounds of feed to produce a pound of beef, and four pounds of feed to produce one pound of pork.

Statistics show that in the mercantile world a large, if not the largest number, of failures are the result of insufficient capital, and the author believes that if statistics could be gathered as to the causes of failures in farm operations, it would

prove that lack of capital had the greatest number to its credit.

If, then, the average farmer has "been shown," and he can secure the capital to buy stock, and will change his methods of producing feeds, he will become an important factor in relieving the meat shortage that threatens our country.

CHAPTER XVI

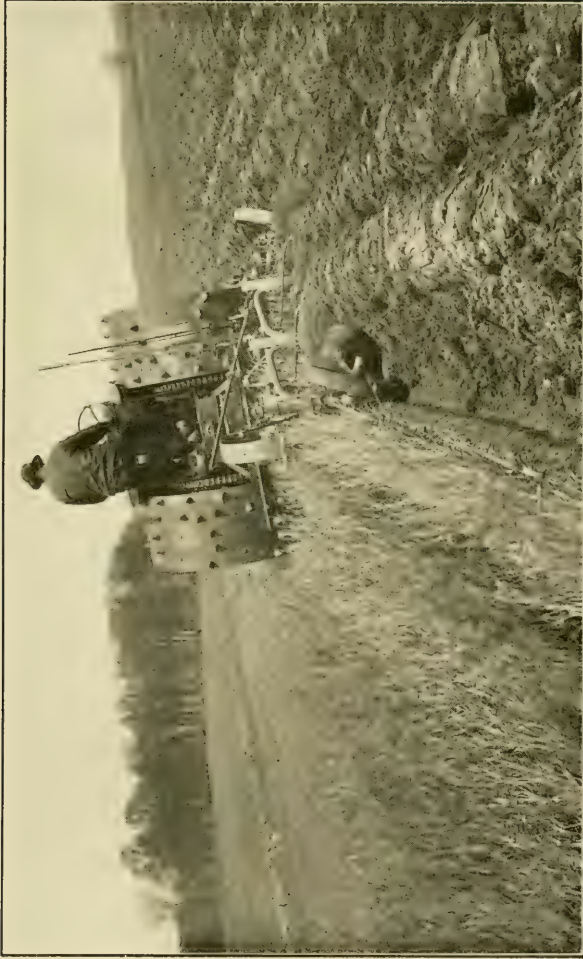
REAL COST OF OPERATION, SHIPPING AND MARKET- ING PRODUCTS

THE market values of farm products are, unfortunately for the farmer, fixed in the markets of the world. The farmer has little, if anything, to say about what price his farm products shall bring. Generally the manufacturer can, and does, fix the market price of his manufactured goods.

The market values of farm products are regulated generally by supply and demand. When there is a plethora of farm products, or any one of them, no amount of organization or coöperation among farmers will boost prices. It may help increase the price for select products, or correct certain market conditions, and in a limited way increase consumption, but a bountiful supply of farm products always has and always will bear down and reduce prices.

Then, if the farmer is unable to fix the price of his farm products, he must, to make a profit, see that his operating expenses are reduced to the minimum.

The manufacturer, in figuring cost of operation, figures not only cost of raw material and labor in working up same, but he also takes into consideration the items of interest, taxes, water rents, lights,



PLOWING WITH SMALL GASOLINE TRACTOR.

This tractor, as shown in the illustration, was pulling three fourteen-inch bottom plows, plowing nine inches deep.

depreciation, etc. So the farmer should, if he would figure the true cost of operation. True this will not avail him much if he cannot fix the price of his products, but it will show him the real cost of production, and may enable him to lop off the unnecessary expenses, or the expense he might get along without, or, at least, enable him to plan to eliminate some of the expenses of production.

The real cost of farm operations is taxes, insurance, interest, rental value of land, repairs to buildings, fences and machinery, depreciation of buildings, fences, horses, mules, machinery, animals kept for breeding purposes and for furnishing food for his family, grain or other products used for food, amount expended for fertilizers and for seeds planted to produce crops for green manuring, expenditures for seeds and plants, plowing, cultivating, and harvesting and hauling products to market.

In estimating cost of marketing products, the actual time expended in the process of hauling products to the market place should be estimated as well as the time consumed in shipping to market and its incident expense, if the farmer or his help accompanies the products to the final market place, and the return to the farm home. From this it will be seen that there are a great many items of cost to be considered in making up the real items of cost of farm operations, shipping and marketing of farm products. So if the farmer has no voice in fixing the market price of his products he can reduce costs. But how?

1st. In the matter of repairs to buildings, machinery, fences, etc., a few dollars spent at the

right time upon buildings in the way of paint, and general upkeep may, and does, save many dollars. As instance in the painting of buildings. If the farmer would paint his buildings white and apply at intervals of a few years apart of but a single coat of paint, his buildings would not only present a neat appearance, but would be preserved indefinitely. The neglect to nail on the loose board, or the broken door hinge, or the replacing of a rotten fence post, or the closing of barn doors and farm gates, results in the loss of many dollars, which could have been saved with a little foresight and action. The failure to keep machinery in proper repair is a source of great expense which adds much to the cost of operation.

2d. The use of poor materials in the construction of buildings, fences, etc., and the purchase and use of poor seeds result in the loss of many dollars. It never pays to buy the "shoddy" in anything. The best is none too good. The purchase of materials for constructing anything upon the farm should be made with the end in view of substituting lasting material for that which soon decays, as substituting cement for wood whenever possible.

3d. The eliminating of the farm fence and reducing its use to the minimum, would not only greatly reduce the cost of farm operations, but add untold wealth to the farms of our country by the bringing into cultivation of lands occupied with fences, and preserving and increasing the fertility of vast tracts of our farm lands which are tramped to their death by the stock turned upon them to gather a little food, resulting in

more lot feeding with its accompanying good results.

4th. The use of the best and most improved farm machinery. The best farm tool, whether for plowing, cultivating, or marketing and general purposes, is the one that will do the work in the best manner and in the quickest time, saves horse flesh or other motive power. If a farm tractor for plowing can be installed upon the farm that will do the proper plowing in the proper time and at a reduced expense, or a two-row three-horse cultivator can be put in use that saves the labor of one horse, and one man, and yet cultivates the same number of acres in a day, and as well as four horses and two men will cultivate with two two-horse cultivators, it can readily be seen that a farmer makes no mistake in installing upon his farm such machinery, or any other farm machinery of like nature, for he not only eliminates cost of operation, but helps to solve the labor problem on the farm. And the installation of labor saving machinery means the conservation of time and human energy, which means much to the farmer, his wife and family and hired help, which helps, not only to eliminate, but to solve many of the problems of farm life, like farm labor, reduced hours for labor, keeping the boy and girl upon the farm, and giving the farmer time for studying his farm problems, and for right and better farm living.

5th. Better machinery for transportation of farm products and better roads. The wagon and horses have long been and will continue to be the farmer's mode of transporting his products to market, and if the farmer is much removed from

market, it constitutes a slow process of transportation. Therefore to make this department of business of farming bear its proportion of reduced cost of farm operations, it is necessary to have the best and most modern make of wagon, which has large loading capacity, and to have the quick stepping draught horses, capable of pulling the heaviest load. But even this would avail nothing if the farmer does not have the best improved highway leading from his farm to the market, and the highway so improved that it is capable of bearing heavy loads at all seasons of the year. For what does even the improved highway profit the farmer if he cannot haul the heavy load over it in the soft seasons of the year when the unimproved roads are impassable and the markets the best?

In most of our states the system of road building is fairly good, but the system of road maintenance is a shame and disgrace to our civilization, and causes the loss of millions of dollars to our farmers in the way of hindrance to getting the advantage of the best market, wear and tear of vehicle, ill spent money for road repairs and inability to haul loads of full capacity.

If the farmer living remote, or even close to market, has the outfit to haul the maximum load, and the highway upon which it can be easily hauled, he saves much valuable time and prevents much wear and tear of his wagons and horses, and conserves the strength and life of his horses, and all these count in keeping down the expense of farm operations.

If our roads were built right and were maintained right, a vast saving would result which

would reduce our taxes, and thus another item of operating expense upon the farm would be reduced. Generally our roads are fairly well constructed, but in most instances, as soon as they are constructed, but little if any intelligent attention is paid to them. They soon become worn into ruts and holes which gather water, that softens and will wear out any road, and in a few short years they are in as bad a condition as they were before they were improved. An intelligent system of road maintenance put in action upon our improved highway immediately after it has been finished, and maintained without cessation, will not only keep our improved highway in perfect condition, but will decrease by one-half or more the cost of road maintenance and thus reduce our taxes.

At no distant day the motor truck will be in common use upon the farm, for it is being rapidly improved in that direction, and cheapened so the farmer can afford to use it. When the motor truck is so perfected and reduced in price, it will be the farmer's best, quickest and cheapest method of transporting his products to market, for it will mean the elimination of time and distance, and thus market his products quickly, in the best condition, and it will save and conserve the life of his horses, and the shrinkage in weight of his live stock in transit to market. And when the farm tractor comes into general use, it will eliminate many of his horses, with their expense of keep, from the farm. Even to-day with the high priced motor truck, many farmers are using them and are greatly reducing the cost of farm operations. If the motor truck is properly handled and cared for

when not in use, it is at no expense except for insurance and the slight cost of depreciation. This is not true of the horse.

In the hauling of grain to market, like wheat, oats and rye, it is common practice to put the same loose in the wagon bed. So, unless the bed be a tight one, much grain is lost along the highway, and that this loss is considerable and much more than is commonly thought, is evident to the observing eye. Recently this fact was noticeably brought to the author's attention. A long, dry period was experienced and the public highways became very dusty and much wheat and oats had been hauled to market. A heavy rain fell and in a few days the highways were green with the growing grain that had fallen from the farmers' wagons into the roadway. The loss of grain may seem inconsequent to the reader, but take pencil and paper and figure upon the basis of the loss of from one peck to a bushel of grain from each load hauled, and the loss will equal this in many cases, and the percentage of loss will startle you, or would startle the manufacturer who is ever alert to discover and prevent such leakage and loss in his manufacturing plant. The farmer, as well as the manufacturer, must study to eliminate waste from the farm, for herein lies a profit worthy of the greatest consideration.

6th. The reduction of taxes. Taxes, like death, are ever present, and are a necessary evil. Taxation is the only method of getting funds with which to keep up the organization of our society, and what would life be without the well regulated society?

To procure this well regulated society, govern-

ment with its attendant train of officials and expenses is necessary. We believe our form of government to be the best, and yet there are evils and misgovernment, and crude methods of doing things that obtain which lead to a reckless and useless expenditure of much of our tax money, which calls for some method of elimination. The eliminating process can only be brought about by the election of men to office who are honest and have the broad vision of governmental affairs, who know something of the principles of true economy, and who know how to do things right. When such men are elected to office, then we will have the best management of governmental affairs; things will be done upon the best permanent and economical basis possible to be obtained, and our taxes will thereby be reduced to the minimum. The farmer can assist in bringing about this state of affairs when he becomes enough of the true politician to take an active part in the primaries and assists in nominating the men for office who come up to the standard named, and to vote for, and persuade other men to vote for, such men whether they belong to his party or to another. The farmer has it in his power to make himself felt in the political world if he but asserts himself with some vigor. The author has had a long and varied experience in politics, and he knows that the politician fears the farmer vote, and many and varied are his devices to keep it in inactivity unless he can get the farmer's activity going in his direction. Be enough of the politician to see that the right men are elected to office, and that the wrong ones who have been elected are retired.

CHAPTER XVII

FARM CREDITS OR FINANCING THE FARM

THE world is now full of agitation as to how best to finance the farmer. One unfamiliar with past conditions would think from this agitation that the farmer of the past or present had been unable and could not now borrow a dollar with which to carry on his farm operations. And yet we doubt whether there has scarcely been a period in the agricultural history of our country but what the average farmer could borrow all the money he ought to have had for his farming operations.

It has been the history that when any portion of our country was opened up for settlement among the first arrivals were the bankers and the men who extended credit to the tillers of the soil. In fact, the farmer has ever been a worthy subject of credit. It has been well said "that his word has been taken at par," and that bankers have had more confidence in the integrity of the farmer than of any other class.

Thousands of farmers have been able to borrow money upon no security other than their reputation for honesty, sobriety and industry, and the further fact that they were engaged in a business that had for its foundation a fertile soil, and the



ANOTHER LESSON IN PICTURES.

“But other fell into good ground and brought forth fruit, some an hundred fold.”

surroundings of a seed time and harvest that seldom failed. So with these conditions obtaining, the man with the qualities named back of him, seldom failed to make good. And the business of farming was regarded as the safest and best credit, and it is so regarded in this day, notwithstanding much of our soils are passing to an unprofitable condition.

There have been times in our country when no farmer could borrow money, or if he could, he was compelled to pay an exorbitant interest.

During the panic of 1903, in the rich corn belt there were scores of farmers who lost their farms now valued at \$150 to \$200 per acre, because of their inability to get their mortgages extended, and the author personally knows of instances where mortgages as small as \$3000 upon 160 acres of the best land ever subjected to cultivation, were foreclosed because banks would not extend credit. But corn was selling for 15c. per bushel and other farm products at like prices. And all business was in the throes of a bitter, galling money panic, and every business man was being touched with its blight.

During the period extending from 1881 to 1903, it came under the personal observation of the author that vast sums of money had been loaned to farmers upon mortgage security at rates of interest which were criminal usury, but these unfortunate farmers had gotten deeply in debt because of the fact that they were either pioneers or direct descendants of pioneers, and their lands were new and it was necessary they should be cleared, ditched, fenced and improved. Improved

highways and public ditches became a necessity. So the doing of all these things, and they were done upon a most extensive scale, called for the expenditure of large sums of money. The price of farm products was low and so the average farmer became burdened with debt and became an easy prey to money lenders who took advantage of his situation to promote their own interests. The farmer seemed to be classed as legitimate prey along the money lending line. Some were able to weather their financial storms, but scores went down under the cyclone of mortgage foreclosure that followed as a result of their inability to meet their mortgages.

It may be safely stated that as a rule the average farmer can secure money or credit to carry on a goodly portion of his farm operations, but at the same time the author has come to the conclusion from personal observation, study and interviews, that the business of farming is either seriously lacking in the necessary capital to carry on successfully its operations, or there is some other cause responsible for many of the conditions that obtain upon many of our farms.

Nine-tenths of our farms do not have sufficient buildings to house the necessary farm machinery to run the farm and so enough farm machinery is exposed each year to weather conditions that results in almost enough loss to pay the national debt. No farmer would leave his implements exposed if he had the proper buildings in which to house them. He simply does not have the money to build the buildings in which to properly care for them and so does the best he can, or he fails to do

it for other reasons. The same is true with his buildings for stock and his fences.

Many farms need ditching, better plowing, fertilization with limestone, green crops, manure and other methods, but the farmer cannot install these things upon his farm for lack of capital.

The average farmer knows the profit to himself and farm in the production of live stock upon the farm. But to do this requires capital which many cannot get for this purpose, or if it can be secured, the interest is so high that stock production does not pay.

We have already shown that the better plowing of the soil is neglected because farmers do not have sufficient money to buy the heavy draft horses or other proper motive power with which it can only be brought about. And so we could go on and enumerate many things that are not done upon the farm for lack of capital.

If it may be safely stated that the many worthy farmers can under present conditions obtain about all the money they need, that many can secure all they should have, but yet, does it not remain a fact that many ought to have more capital who can not get it, and especially many who wish and who ought to get back to land who cannot under present conditions secure the necessary capital to accomplish their desires?

We have already shown that the system or plan adopted by which the capital can be secured must be safeguarded in many ways.

The government has had a policy by which in the several states a school fund was obtained by the sale of every sixteenth section of land when

lands were thrown upon the market by the government. This fund was loaned in Indiana to farmers upon farm real estate, the loans being made up to one-half the appraised value of the land, and were made for five years' time at six per cent. interest, and thereafter could be continued for as long a period as desired by the borrower.

The majority of these loans ran for years and it is questionable whether they were a good thing for the farmer. The farmer knew they did not have to be paid when due; that they could be continued as long as the interest was paid. At one time the author was employed by a county to look up these loans, and where they were delinquent, to see that they were either paid or renewed. He found that in many cases they were made upon lands not valuable which had been over appraised and owned by thriftless farmers, so a large number of these loans had gone for over twenty years without anything being paid upon the principal.

A long time loan made upon land well up to its real value should have a required yearly payment clause, at least after three years, as this will promote economy and thrift. Of course time should be given the borrower to become established upon his land, but as long as he knows he can carry the loan for a long series of years without being required to make any payment upon the principal, he will not likely make any effort to adjust his affairs and expenditures so as to meet payments.

So the best method of safeguarding a system of farm credits is to get into it the element of fear,—fear of loss and foreclosure. Let the borrower

understand he must in the course of a reasonable time begin to make some payment upon his loan or suffer the consequence of his neglect.

It is said that mortgaged indebtedness on the farms is on the increase. And so is the indebtedness of city business on the increase. In fact, national, state, and municipal indebtedness is on the increase. The debt machine everywhere is running at too high a rate of speed. Extravagance has extended into both private and public affairs. It is our national sin and there ought to be a slowing down process. But at the same time we must consider that it is a truth that there would have been but little progress in this country of ours if it had not been for the vast sums of money available for the borrower. Few men would engage in the business or undertake to carry on our different enterprises and business if they were the owners of large capital. The men who built up both the large and small prosperous enterprises, no matter whether found in city or town, have been the industrious, honest men without capital, who had the confidence of the money loaner and began and carried to success their enterprises almost solely upon borrowed capital. There is no reason to expect that there will be a change of conditions in this respect in the future. We must expect that all lines of business will be transacted by men who will be large borrowers of capital.

It is shown by statistics that in 1910 it required six billions of borrowed money to produce the eight billion dollar crop of the year, upon which there was paid an average rate of $8\frac{1}{2}$ per cent. interest. But statistics will show that the busi-

ness of the city required as large, if not a larger amount of money in proportion to business done, to successfully carry it on. However, it is said the city business man has been able to borrow his money at a lower rate of interest than the farmer.

If this be true an injustice is being done to the farmer, for if the business of farming is the very foundation of every other business, and the very existence of man depends upon it, it ought to be able to even secure the capital necessary to carry it on at the lowest possible rate of interest. We must safeguard it in this respect or our nation goes into decay and death.

We are removing the hindrances to the business of farming by better education, better farm literature, better marketing facilities and in numerous other ways, but we must not neglect the main thing, the "sinews of war" of the business of farming, capital. For without capital at living rates of interest, the farmer is helpless.

The political demagogue in this country has done much to lessen the supply of money for the business of farming. It seems that most of us have been so busy with our personal affairs that we forgot to attend the primaries or conventions and so we have sent men to our legislative bodies, many of whom were as ignorant of business as little children, or else were unscrupulous, and so laws have been enacted under the guise of correcting imaginary evils, which have actually driven legitimate capital from some of our states to the detriment of the business of farming.

But the tide is turning and the nation is realizing that capital is a legitimate enterprise with its

evils the same as you find in every line of human enterprise, that can be controlled and directed by sane legislation so that it will be the power for good it was intended to be in every community of our land. We must safeguard capital, labor, and business enterprise, and give them the broadest opportunity, and thanks to a sane and safe man at the head of our nation, the things are being done that will open the way for this greater opportunity. When the way is open and it is made safe from the political demagogue or other piratical influences, then will capital begin its journey and go into every part and portion of our land, extending its helping hand to business enterprises. When capital is seeking and importuning for opportunity of investment, then down comes the rates of interest and there is opportunity for the honest borrower to secure all the money he needs in any legitimate business.

CHAPTER XVIII

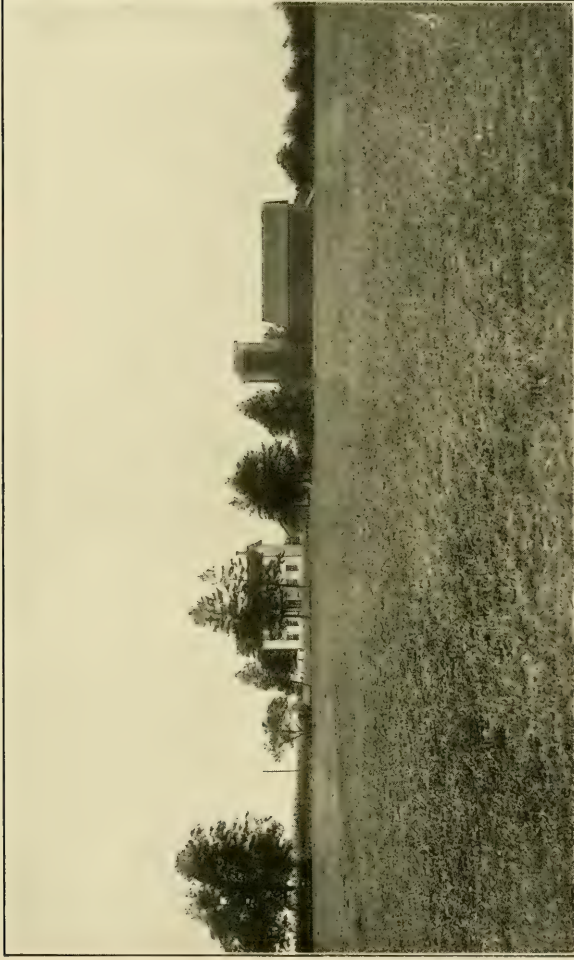
THE CONSERVATION OF HEALTH AND HUMAN LIFE ON THE FARM

THE conservation of human life in the poverty and vice districts of our congested cities is a tremendous problem, touching the heart and purse of our philanthropic spirit. It is, however, as important a problem in the workingmen and working women districts of our cities. The incessant toil and grind of our underpaid workers, struggling against the ever rising tide of the high cost of living, is cruelly breaking down the ambition, the hope, the courage, and crushing the health and lives out of millions of our people.

But the farm has not been without this human tragedy. It does not, however, exist to-day to so great an extent as in past periods of our farm history. In the cities it is hard to remedy the condition of the underfed and the overworked; in the country there has never been any excuse for its existence.

The author has seen the farmer with his broad acres and large, young family, going the pace of the grind that drives from the farm to the city, the insane asylum, and that kills.

Plenty of work amid healthful surroundings, with enough of the right kind of food, properly prepared, with plenty of the life-giving balm of



AN OLD TIME WORN OUT FARM BEING RESTORED BY MODERN
SCIENTIFIC FARMING.

The silo is one of the means being used to restore the fertility of this farm.

sleep, a dash of harmless amusement and recreation, never kills any man, woman or child. It is only the incessant work amid conditions that breeds disease, without food properly cooked for eating, and without the period of relaxation and rest, that kills. The author has seen the young farmer and wife, even on a farm of 160 or more acres, arise at the unseemly hour of four o'clock in the morning, rousing out the young family of six or more children, putting them to work in the preparation of the breakfast, feeding of the stock, harnessing of work horses, etc., then sitting down to a quickly and illy prepared breakfast, gulping it down in haste; then the father hurrying the boys to the field long before the morning light had lit up the landscape, where, with broken rest and tired bodies, they listlessly toiled until the dinner hour. The mother would hurry the girls to the milking, the care of the house, poultry and the garden, they toiling under the same conditions of broken rest and tired bodies. The dinner and supper hour were but the repetition of the hurly-burly of the morning. Work in the fields and household extended far into the fading twilight. Chores about the house and barn were done by lamp light. The beds were sought by tired, unrelaxed bodies, who secured but a fitful sleep, only to be awakened for the same daily monotonous grind. A few years, including both winter and summer of this kind of cruel living bent and wrinkled the once blitheful, pretty body and face of the mother, made her body an easy prey of disease and she was stricken with an untimely death. She would be laid among the weeds and brush growth

in an average neglected country burying ground, and a cheap stone erected at the head of her grave, upon which, through the weeds and brush, you may see inscribed "Sacred to the Memory of Eliza Jane, Wife of John Jones." A more fitting inscription would have been "Here Lies the Tired Worn-out Body of Eliza Jane, Wife of John Jones, whose life was crushed out by an Unnecessary System of Farm Living."

Insufficient sanitation and the deadly well have given death a rich harvest upon the farm. The author has seen almost whole families swept away by the deadly typhoid fever whose origin was traced to a contaminated or neglected well, or to some cesspool near the farm dwelling. The existence of these death traps are due to ignorance, indifference, or laziness. There is not the slightest excuse for their existence upon the farm.

A farmer owes it to his family to furnish them, as well as himself, with plenty of pure water which is the great preventative of disease. A pure water supply upon most farms can only be obtained by the driven or drilled well put down to a sufficient depth to secure water from a stratum which cannot be reached by surface contamination. The open or dug well or the shallow driven or drilled well, are nearly always death traps and should be avoided as a pestilence. The author has seen water drawn from dozens of farm wells that was ill smelling and with a most repulsive taste. These waters were laden with the germs of the most fatal diseases, and yet their owners were making no effort to improve them. That the people who partook of the water of these wells were

not stricken with fatal diseases was because their bodies were in condition to resist diseases, but alas! the cemeteries contain the decayed and decaying bodies of scores of people whose bodies could not resist or throw off these disease germs and so they were stricken down before their time, upon each of whose tombstones should be inscribed "A Victim of the Contaminated Well," as a warning to the living.

A short time ago the author visited a farm home where the good wife of the farmer lay stricken with a severe case of typhoid fever. For location, the farm was beautifully and healthfully situated. So the author began to look about to see if he could find the source of the dread disease. The yards surrounding both home and barn were ideal. They, as well as all out buildings were clean, well drained and free from any filth which would harbor typhoid germs. Knowing that typhoid fever is, in the largest number of cases, contracted from typhoid germs found in the drinking water, the author investigated the well and found an alarming state of affairs, which in his judgment, was the source of the disease, yet the family seemed utterly unconscious of this fact. The well was situated close to the house in an angle of the building. It was a shallow well covered with large boards laid upon the ground around the well, which left large cracks between each board. This loosely constructed platform was about fifteen feet square, and to enter the kitchen and another room of the house, it was necessary to pass over it. The dirt of the barnyard and barns were carried by the feet upon this platform. The dirt from the home was

swept upon this platform. The platform could not possibly be cleaned without a great portion of this filth being swept or washed into the cracks of the boards. There being no shed over the platform, the rains fell upon it. The kitchen floor was scrubbed and the dirty water swept out upon the platform. The water from the scrubbing and the rains carried the filth and dirt down into the well. The season being dry, the water became low, typhoid germs developed in the drinking water. The woman's body was not in condition to resist disease and she was stricken, and it was easy to see from whence she contracted the awful malady.

If a farmer has a well with even the suspicion of contamination, all other work on the farm should be suspended until this evil is corrected. If he has not the money to pay for its correction, he had better borrow it, and if he can not borrow it, he had better sell the best horse or cow on the farm to secure the necessary money.

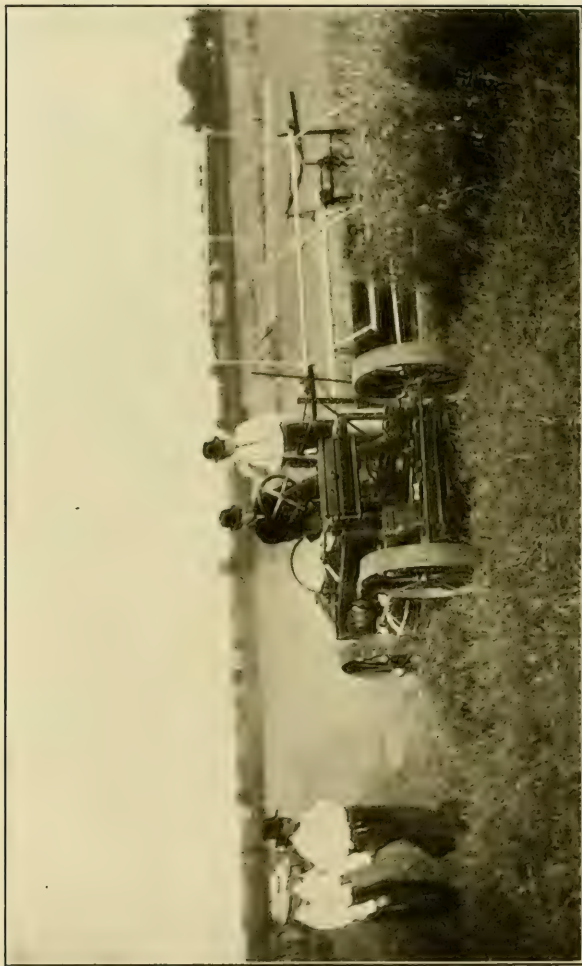
Health and human life can be greatly conserved on the farm by properly constructed dwellings providing for the disposal of sewerage and wastes, but more of this in another chapter.

It is useless to attempt to conserve health and life upon the farm unless they who reside on the farm are supplied with plenty of wholesome, well, and properly cooked food. To some this may seem a strange statement, considering that the average farm produces so much and so varied a supply of human food. Many of our farm wives and daughters are good cooks and put upon their tables meals fit for a king, and as health giving as

can be prepared. But do not deceive yourselves by thinking that this condition obtains generally now upon the farm, and has always so obtained. The summers of six years of the author's life were spent in following his trade of a stone and brick mason, and a large amount of his work at his trade was done for farmers, and he was compelled to board among them. The memories of a great number of the meals of these days haunt him yet. Tired and hungry from his work he has sat down to meals, prepared by farmers' wives who had at hand a burden of the best food products of the farm and proper facilities for cooking same, that were enough to sicken the stoutest stomach. And these were not isolated cases by any means. Their number was appalling and they were found in the "best families." The author was unmarried then, but he vowed a vow that he would never marry any woman until he first ascertained whether she was a good cook, and he is happy to state that he found just such a woman and that she was a product of the farm, and learned the fine art of domestic science from a skilled country mother.

A system providing for the proper number of hours of labor, with improved labor-strength-saving machinery, sane periods of rest amid healthful or sanitary surroundings, plenty of well cooked food, supplemented with liberal amounts of recreation, will do much to conserve the health of human life upon the farm, and every farmer owes it, not only to himself and his family, but to mankind, to put forth every effort along these

conservation lines for herein is based the happiness and the prosperity of the farm, for without health we are indeed surrounded with "shallows and miseries."



THE HORSELESS AND CANVASLESS BINDER, INTRODUCING ANOTHER ERA
OF IMPROVED FARM MACHINERY.

A Prophecy: Within a period of five years, plowing, tillage, planting, cultivating, harvesting and marketing of crops, and other farm work will be done by improved farm machinery propelled by gasoline, alcohol or electric power.

CHAPTER XIX

FARM BOOKKEEPING

EVERY man engaged in a business ought to keep a set of books in order to know whether his business pays. If it does not pay he of course will find it out in due time, although he kept no record of his business transactions. But that time may be too late. He may be in the throes of bankruptcy. Some system of bookkeeping is necessary in every line of business. Bookkeeping is the chart and compass necessary to have in sailing the ship of business upon the mercantile sea.

City business requires a more elaborate system of bookkeeping and so men are employed as bookkeepers well trained in the art. A trial balance is necessary to ascertain the drift of the business.

But few engaged in the business of farming could afford to employ a bookkeeper to keep track of farming operations, so the system of farm bookkeeping must be of the simplest kind. The average farmer would not recognize a trial balance no matter where he might come in contact with it. And it is not necessary that he should recognize it in order that he may successfully carry on his business.

The richest farmers the author ever knew were men who could neither read nor write. He recalls

one farmer who loaned thousands of dollars to scores of parties, and yet he could tell to a cent the amount of interest that was due at any time upon any of his loans, and the amount of the loans, when due, etc.

And the author has known farmers who kept a good system of farm bookkeeping that made failures of their business. But neither of these cases argue for or against farm bookkeeping.

Farmers of the past generally had no training whatever in the art of bookkeeping, and even if they had, the exaction of their business was such that they were too tired at the close of their day's work to spend much time in bookkeeping.

But the up to date scientific farmer with the improved farm machinery that lessens his hours of toil has the time untaxed from physical exertion to devote to a simple system of a farm bookkeeping which ought to be instituted upon his farm.

For years the author has kept a farm diary in which he has daily written a short account, showing the kind of weather and what was done upon the farm in each particular day of the year. This has proven of great value to him. As in the former year's record he found much that was of value for the present year's operations, in these daily records he kept the time of labor employed for each day, and names of parties who performed the labor, the kind of labor done, and also of any expenditures or purchases. His diary thus became a simple day journal by which he kept a complete track of his farm operations, and the time consumed in keeping this record was so small that it was not irksome in the least. It was done at

the close of each day before retiring. In connection with this simple diary he kept an account of articles purchased for the farm, and of every article sold, showing purchaser and price received for each article sold.

From such a simple system of bookkeeping the average farmer ought to be able to know whether his business pays. He can easily tell whether he is prospering. He may not be able to figure depreciation, interest on capital, charges for his own labor and such things to that nicety and exactness that the trained bookkeeper with his elaborate trial balances would be able to figure out, nor would he debit his business with every cent it ought to be debited with, but he would know whether he is "going into the hole," or how much he was running behind each year. It would not require an elaborate system of bookkeeping to show him that he had a home surrounded with the comforts and pleasures of life and was possessed of a business that had great possibilities for those other profits that were greater to him than "bookkeeping profits."

An elaborate system of bookkeeping upon the farm no doubt might in many cases teach us that a real farm home might not be a money making institution, but as some one has said a real farm home "is a place to live, not a place to make a living. A place to rest, not to toil. A place to meet friends, not customers."

A complete system of bookkeeping upon the farm figuring depreciation, interest, insurance upon his property upon which there is no debt, and the farmer's labor would doom every farmer to a

loss, which if eliminated in calculations would show a handsome profit in his farm operations.

Keep in mind the rational home rather than rational bookkeeping. If you are a "back to the lander" don't forget the expense and annoyance of the flat or other city dwelling, and the city living you escaped. Compare it in all things with the farm living. Consider the standard of living you now have for your family.

The elaborate system of bookkeeping will figure cost of farm operations down to the greatest fraction of a cent, but it will never figure the comforts, the pleasures and the profits of the good living your farm gives or sells, although it may not give or sell the profit in dollars and cents.

But we still believe the farmer ought to become familiar with farm bookkeeping and put it into practice in his business for it may show him where he can eliminate waste and how to curtail expenses in many ways that will make his business more profitable.

The system of bookkeeping for the farm should therefore be one with the frills of the city bookkeeping left off. A simple record of farm transactions from which any farmer could be able to ascertain whither his business is drifting financially, is all that is needed.

We believe that the curriculum of agricultural studies, no matter whether for the public schools or colleges, should give bookkeeping a prominent place, for knowledge of this subject will make it easier for the man engaged in the business of farming to keep up even a simple system of farm bookkeeping and will also enable him to keep the

more elaborate bookkeeping system as well, if his fancy should prompt him to indulge in the higher lines of bookkeeping.

The details of every business should be closely looked after, but the slave to details is apt to overlook the essential thing in his zeal for details. Therefore, the farmer who spends the time, energy, and thought, upon the mere details of his business like bookkeeping and the like, that should be spent in looking after the essential things of his farm, like proper care of his stock or his soil, is sacrificing too much for the minor things of his business.

While farm bookkeeping should not be omitted from our farm economy, yet the business of farming has been carried on successfully by a great number of persons without it, and could be so carried on in the future. The point we wish to emphasize is, look after the essentials first and do not attempt to do those things to a nicety that are not so essential to the success of your business.

CHAPTER XX

THE RETIRED FARMER AND THE FARMER AS AN OFFICE HOLDER AND CITY BUSINESS MAN

WHEN we consider the startling fact that eighty per cent. of the cities' business and professional men, sixty per cent. of the men and forty-five per cent. of the women teachers in our city public schools, were reared on the farm, and that these men and women are of the best blood of our farms, is it not time to stop and inquire what is the matter with the business of farming that allows this blood to flow from its region into the region of city life?

Is there a plethora of workers, brains and good blood upon the farm which is compelled to seek employment elsewhere in order to exist? We are loathe to believe it, at least we will not believe it, until every mouth in our land is filled three times a day with enough food to satisfy the pangs of hunger, and every human body of our land is comfortably clothed from the products of the farm.

Of course our cities will ever continue to gather from the farms its best blood, but some awful wrong is being allowed to exist when so great a per cent. of the farm's best blood is allowed to flow unrestricted to the city. This blood is needed upon the farms and will be more needed if our soils are permitted to continue upon their road to



THE COVER CROP.

"Out in the Orchard Where the Children Used to Play."
The successful orchard of to-day is the one well tilled and cultivated during the late spring and summer season, and sown to a cover crop in early fall for winter covering and for fertilization.

destruction, as much of them are being headed in that direction by a thoughtless method of farming. But we have already called attention to this hindrance to the business of farming, and have given the remedy which will largely correct it.

There is another deplorable state of affairs obtaining in many portions of our fair land to-day that means a greater menace to the business of farming. In most any city of two thousand inhabitants, and over, and in most all our villages of less than two thousand inhabitants, we find already erected or in the process of erection, innumerable houses of no mean design and dimension, which have been erected or are being erected by farmers who have, and are retiring from their farms and leaving them in the hands of tenants. And it is a distressing fact that the larger per cent. of these farmers must depend upon the returns of their farms for their support, and a deplorable fact that their farms are leased under the one year plan that means certain death to any farm. More than thirty per cent. of the farm lands of our country are in the hands of tenants already, and the percentage is increasing at an alarming rate.

This state of affairs can and does mean nothing else than the awful fact that the acres of these rented farms will be put under the lash, and the "whip and spur method of farming" will obtain upon them, and they will be forced to produce every dollar they can that both tenant and landlord may live. Not even the thought of soil conservation or fertility maintenance will ever be allowed to enter the minds of either tenant or landlord, and year by year, under such methods of

farming, the acres of these farms will lose little by little, yea, much by much, of their fertility until within less than a generation barrenness and sterility will be their doom.

Do not understand that the author is condemning the tenant or a proper tenant system. They are both a legitimate and necessary part of our farm economy and must be conserved along right lines. But to accomplish and bring about this state of affairs there must be in some manner instilled into the hearts of both landlord and tenant the spirit of "fair play." The miserly, grasping, exacting landlord and the tenant thieving "whip and spur" method of farming make a combination that will bankrupt any landlord or tenant, or drive any soil into abandonment.

We have already said something about the tenant system obtaining in England. A system by which landlords rent their lands for a series of years, in many cases for periods of twenty years, and receive for rental as much as \$20 or even more per acre. But the tenants proceed to farm these lands as if they were their own. They farm them to make them pay. They feed the lands with animal, mineral and green manure. They plow deep and give the best possible tillage and grow the crops that are in demand and produce the quality that commands the best market. These tenants without exception are prospering and many of them are amassing wealth. The landlord not only receives a large yearly rental, but receives the increase in value of the fertile farm.

Can any one advance a sound reason why such things are not possible in this the land of oppor-

tunity? It will never be done under a one year tenancy. Is it not an opportune time for the landlords and tenants of our land to get together and wake up to their possibilities.

The excuse of the owners of these farms for the criminal desertion of their farms is that they wish to escape the drudgery of the farm, or they are seeking educational advantages for their children, all of which are nonsensical, untrue, and not worthy the name of an excuse. The same money expended to plant themselves in the city or village would build and equip the most modern and attractive buildings, equipped with every labor saving device and comfort known to any city home. Systems of water works, lighting and heating are now accessible to every farm home as cheap, substantial and serviceable as can be installed in any city or village home. The perfected phonograph and musical and other devices for amusement are possible upon the farm.

The automobile, trolley lines and railroads, and other facilities to obtain an education, make it possible for the farm boy or girl to obtain an education as easily as the city boy or girl, and there is no need for the farmer to move to city or town to give his children these educational facilities. And by remaining on the farm he escapes the most serious and disastrous things that can befall the young boy or girl,—idleness and the false view and notion that we are in this world for the pleasure we may get out of it. If the farmer remains on the farm and sends his boys and girls to the city school that provides for agricultural and domestic science training, they return during vacations and

find work to do that aids in the building of their characters, and fits them for the active duties of life and good citizenship. Whereas, if they live in the city or village, their vacations are spent in idleness that so unfits the boy and girl for the serious duties of life.

If, then, the farmer can secure upon the farm the enjoyments and privileges that can be obtained in the city, why should he bring himself within the other environments of the city that are pernicious to himself and family?

For a half century the author has lived in close contact with the farmers of the rich corn belt of Indiana. For years he was the legal adviser for hundreds of these farmers. He mingled with them and their families, even in their homes. He has talked to them as a public speaker in their school houses, churches and public halls, discussing politics, temperance, and farm problems. And he has ever been a close observer of their class. Letting his memory go back over these years of activity and intermingling, he recalls scores of farmers who moved from the farm to the city either as office holders, or seekers of better business and educational opportunities, and peaceful retirement, and nearly every single one of them made the greatest mistake of their lives.

He has seen active men with industrious, interesting wives and children, live forces in the farm communities in which they resided, and living under conditions that ought to have contributed contentment, happiness and plenty, who began to dream of office holding and city merchant's lives, and came to the city to realize them.

While the dreaming of dreams has led to great achievements and successes, yet it has too often led into the direction of failure and disaster.

Joseph, wisest statesman of any age, dreamed the dreams that led him to the throne of Egypt, where his wise methods of action saved the Egyptian and his own people from the ravages of famine. Aaron Burr was also a dreamer of dreams, but his dreaming led him to the heights of sovereign power and dignity in our nation, where his methods of action made him to become the most despised statesman of our history.

The lives of these men have been exemplified in the lives of thousands of men of smaller caliber who have dreamed dreams and sought their accomplishment. Some made good, the great majority failed. Those farmer dreamers observed by the author came to the city, as county office holders, or became city merchants. They found themselves under different environments. Their habits of life were entirely changed which called for a greater expenditure of money than that to which they had been accustomed. They were exposed to temptations to which they had never been subjected before. They and their families became impregnated with false notions of life and living. Upon the farm opportunities for work were ever present, which built up their better natures and made them what God designed they should be. The city life destroyed their opportunity for work and the curse that follows, idleness, fell to their lot.

When the terms of office of these men expired they and their families found themselves so tightly bound with the cords of city environment that

they resented any proposal to move back to the farm, and these men were persuaded to embark into some city business for which they had no adaptation or training, and so it was but a short time until they made miserable failures and their property was swept away and for ever afterwards they were as derelicts upon life's sea. And of the few who at the expiration of their term of office did go back to the old farm home, it was with a discontented and dissatisfied spirit which so hung about them that it prevented them from getting properly back into country life again.

The effects of city environments caused the women and children of these men to so act towards their old neighbors and friends as to stir up animosity and strife. The men themselves, had, too, fallen under the effect of city environment that leads to speculation, were no longer content to devote their entire attention to the business of farming, so they engaged in contracting for the doing of public work, stock buying, or some work for the doing of which they had no training or experience. Their farms and the business of farming were neglected and they too in time found their property swept away and the remainder of their lives were bound with misery.

The men who did not come to the city as office holders, but to engage in a city business for which they had no adaptation or training, also, as well as their families, fell under the spell of the city's environments and temptations, their lives and business became failures and their property too was swept away.

The author has seen numbers of farmers who

caught the fever of "retiring from the farm." God pity the farmer that comes under the spell of this insidious farm disease.

After years of living upon the farm home which should have in those years been transformed into such a haven of rest that no temptation on earth could compel him to leave it, the farmer suddenly discovers he is working too hard, or that the place is not large enough for himself and the boys, and he begins to dream of the ease and peace of a retired city or town life. Part of the dream becomes a reality. The life-long associations of the old farm home are left behind and he and his good wife and younger children settle down amid new environments, only to find within a short time that they cannot shake off the old environment for the new. In the majority of cases it is found that city and town expenses exceed their incomes and in their attempt to adjust incomes to meet expenses, they resist and kick against every improvement inaugurated, and appeals made for charity or religious purposes.

The author recalls one retired farmer who when he lived upon the farm was a devout Christian, the leader of the church and Sunday school of his community, and never missed a religious service. When he retired to the city he transferred his church membership to the city church and enrolled himself with the men's bible class in the Sunday school. All the members of the class had pledged themselves to contribute ten cents per Sunday. Rather than pay ten cents per Sunday this man quit going to the Sunday school. He was compelled to save every possible cent that he might live

within his limited income. It is needless to say that he developed into a kicker, and kicked against every movement of the church or his city that called for the expenditure of money. Had he remained on the farm he would have still enjoyed his church privileges and been a power for good in the farm community, lived a peaceful life, spared himself much humiliation, and the town community would have avoided his irritable presence.

The author has seen old people retire from the farm to the city, who, on the farm had been surrounded with life-long, kind, and sympathetic friends and neighbors who were their close daily companions. City people are divided into clannish, narrow circles too often bent on society's doings and pleasures. The women of the thriftier class are caught in the maddening rush of parties, entertainments and receptions, and those of the middle or poorer class are caught in the grind of respectable and abject poverty. City men generally must be madly engrossed in the business or work in order to maintain their positions or even to live. Such a body of engrossed men and women are not likely to take on new acquaintances or associations, and they merely politely notice the retired farmer or his family, so he finds himself "midst the crowd, the hum, the shock of men." "He sees, hears and feels, but he cannot possess." He roams about the city's street with 'none to bless him or none whom he can bless,' with kind and good companionship—the awfulness of solitude midst the crowd that throng him becomes his lot. Upon the farm he had the consolation of

friends, the health and pleasure giving work that is not to be found in the new city home.

Go into any city or town in the fore part of spring, summer or autumn days, and you will see these retired farmers in their buggies heading towards their farms to spend the day. The look upon their faces too plainly bespeaks their unhappiness, and that they feel they are not needed in the city. Nor are they needed there, because they cannot assimilate with the city's life and activity. Cities and towns need young, active, enterprising and constructive men. The country needs the experience, advice and the money of the men who would retire from the farm to the city. It has been well said that "a retired farmer is capital going to waste."

And yet there is a pathetic side to this question that appeals to us. Too often none but the old folks remain on the farm. The children are gone and the father and mother sit in the old farm home lonely in life's decline. Though surrounded with plenty and to spare, yet they look out through misty eyes into "the orchard where the children used to play," and their "old hearts seem so empty every way" as they dream and dream of their happiest days when their children were young and were all in the old home nest. But it is even better to sit in lonesomeness and dream your lives away with your old friends, mid the scenes of your tenderest associations than to add to your heart-aches the misery of the lonesomeness and solitude you surely will find in a new home in city or town.

Many retired farmers say they want to go to

town to rest, forgetting the fact that true rest can never be found in idleness. It is only found in activity that leads out the mind in thought. The farmer, if he sticks in town, loses that interest in the farm that leads to experimenting, and in the study of new methods, and so the farm is neglected. He wanders about the streets in idleness and seeks the company of idle men. You will find him on the street corners, in stores or where idle men congregate, discoursing problems of state, national and local government, and nine times out of ten these discussions partake of the nature of opposition or a kick. He neither constructs nor buildeth himself, and wants no one else to construct or build.

The death rate among retired farmers is larger and there is a reason for this. A man who has been an active worker all his life is generally a heavy eater, for he must needs be in order that his body be kept in condition for the best service. When he becomes an idle man, and most all retired farmers do become idle men when they move to the city or town, he does not generally change his habits of eating. Idleness and over eating, especially in elderly people, make a combination that soon brings on disease and death.

To the farmer who is about to retire from the farm we say "Don't." Retire on the farm. Take the money that is required to establish yourself in the city or town, and build a house for your tenant. Install in your old home every modern device that brings comfort and lessens toil. Fix up the old home surroundings with flowers, trees and shrubs. Touch up the old orchard with trimming, spraying

and fertilization. All this will keep you busy and give you work worth while, and work that will not only prolong and make happy your life, but will be an uplift to your family, your neighbor, and to your fellowmen. You will be keeping in touch with the farm and will get in the right mental state towards your soil that will lead you to increase its fertility. Gather around you the best farm literature, keep active with all the organizations of church and the like that promote the betterment of farm life and society. If in the doing of all these things your life becomes insipid and you begin to dream of city life again, take on some fad like producing and perfecting a special breed of stock, chickens, seed corn, fruit or the like, and work at it until it interests your every moment. It will not only amuse and interest you, but will result in profit, and keep you from rusting out, and above all, will keep you on the farm and keep you from the heartaches you surely will find if you flee to city life.

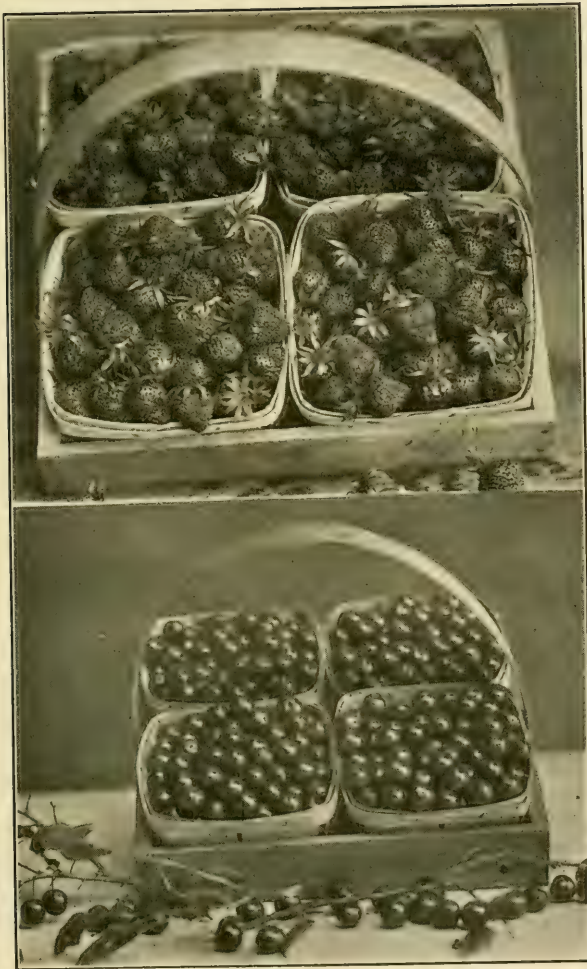
CHAPTER XXI

RELATION OF RELIGION TO FARM LIFE

THE cynical non-religious reader will not be able to see wherein religion has much to do with the business of farming. But if he will consider he will find that it has much to do with it. Everything that breeds content with one's station should be courted and won and be made a part of us.

Life at its best is full of sorrow, discontent and a restlessness that seeks for a happiness which is seldom if ever found. That restlessness which leads us to put forth the effort to so improve our surroundings that toil will be lessened and efficiency be promoted, or will make better husbands and wives and children, citizens or neighbors, is to be encouraged; but the restlessness which seeks pleasures that never please, but make us worthless for having enjoyed them, should be frowned upon and discouraged. Therefore anything that will bring to our hearts peace and contentment and leads us into paths of usefulness, should be encouraged in every way.

The religious faith of our fathers, fought for through dungeon, fire and blood, founded upon the simple life and teachings of the Christ, has been the living faith that has touched the hearts of noble men and women, bringing peace and joy to their



“THE FRUIT OF VINE AND TREE AND OF VARIED
HUE.”

Fruit of many kinds is possible for every farm, no matter where situated. And there is nothing produced upon the farm which adds more to the health, good cheer and pleasures of farm life than an abundance of varied fruits.

souls, removing the burdens of sorrow, brightening life's journey, and making earthly existence worth while.

The author has never possessed an over abundance of this peace giving religion, but an extensive observation has led him to the sure conclusion that this simple religious faith makes not only better men and women, but puts into their hearts that spirit of peacefulness and contentment that makes them proud of their station in life, shows them the golden opportunities lying at their very doors, and causes them to strive only for the better things of life; to dream the dreams of usefulness and not of folly and unsatisfying pleasures.

It is universally conceded that no city community would be a safe place in which to live if churches and church privileges were wiped out. The church is the safety valve of every community.

A farm community prospers in proportion as its churches prosper. This has ever been true, and will so continue. Therefore any farmer who has the best interests of his family at heart, must contribute and aid in maintaining the best and most active church life in his midst.

Our ancestors fled from the religious oppression of the old world, endured the hardships of the early ocean voyages, came to the bleak, barren, inhospitable shores of the new country, and amidst discouragements and hindrances, which only the religion of the Christ could help them to endure, forged out a civilization, founded upon a puritanical religion, which has given us the spirit of thanksgiving and the sturdy manhood upon which has been builded much of the greatness of this

country of ours. Our fathers realized that the youth educated without the training of the church was like a rudderless ship upon life's sea, where he became an easy prey to temptation and easily succumbed to vice and immorality which abound in plenty in the weak church community.

George Frederick Wells has well said, "The American farmer was at one time preëminently religious. Whether he lived as the child of the Puritan theocracy or as the patron of early Virginian aristocracy, he tilled the soil in order that he might worship God and rear his children in the fear of the Lord. Whether he cleared the forest under Penn, the patriarch of piety, or planted his windmills by the steeples of New Amsterdam, his fire-side was his synagogue and his temple the house of prayer."

And so we might add that the children of this American farmer went out from the old homestead hallowed by a Christian association that followed them to the city, and that led them to found the city church that made the cities a safe place in which to live, and extended the missionary spirit that is evangelizing the world.

This preëminent religious faith of the early American farmer gave to his children an inheritance more valuable than the other education he gave them, or the dollars he left for their inheritance. It gave them that sturdiness of character essential for the enjoying of the higher and better life.

You cannot truthfully say that any of these children when they had left the old home nest forgot the religious training of the old home. Some of

the weaker ones by reason of their lack of strength may have fallen victims to temptation, yet in the darkest hour of their lives, they never forgot the religious life of the old home fireside or the simple religious faith of father and mother. And this religious faith was the shield that protected the stronger children from the temptations and vices of life.

There was a time upon the farm when almost the whole community attended church services. In most farm communities the majority attend now, and yet in many communities the rural church has gone into decay.

It is not our purpose to enter into a discussion of the cause of the decay of the country church. Our purpose is to emphasize the fact that the live spiritual practicable church is needed upon the farm, located where it is most practicable to reach every one engaged in the business of farming. Every tiller of the soil to get the best out of life for himself and family must "find the home of his higher life in a living church."

We sometimes fear that we are devoting too much time to the promulgation of the foreign missionary spirit to the neglect of the rural church. Is it not better to first give us the strong church in every farm and city community and then let the light of the church extend out and beyond?

If sectarianism has been one of the chief causes of the decadence of the country church, then the sooner sectarianism is eliminated, the better. It is the simple religion of the Christ teaching the Golden Rule and the brotherhood of man, that

is needed. The dogmatic doctrine of a dogmatic church should have no place in any community.

The great movement now being put forth to uplift the business of farming will be a failure if it fails to include in its panacea for the uplift of the business, a genuine religion for the farm. But it is up to the farmer to provide these means by which this religion can be secured, and he will do it if he can be made to see the need of it to himself and to his family. He must be made to see, however, just as the city church must be made to see, that the church must be a place where the social side of life must be properly developed, and that the problems of his business are as sacred as religious topics and that there is no harm in discussing them in the church at opportune times.

The country church should be the social and educational as well as the religious center of every farm community.

We hear it so frequently said that the country church decays in proportion as the number of farm tenants increase. If this be true it is indeed a sad state of affairs. Is there a reason why the church should not appeal to a tenant and his family? Is he any less a human being because he is not a land owner? He and his family are subject to the same laws of life and being. He certainly needs the consolation, the uplift and the peace of the simple church religion, and if the tenant and his family get the notion that they do not need this religion, they have gotten the false view of life. If the tenant and his family will but faithfully practice the religion of the country church they will become better tenants and better

citizens of their farm community which will surely bring to them the prosperity that will lead them to land ownership.

The church is a leveler of classes. If a different notion prevails it is not the fault of the church, but of men. To get the best out of the business of farming one must get in the proper mental state towards his wife, his family, his stock, his farm and his soil. He must take pride in his home, its furnishings and surroundings, and his entire farm with all its belongings. He will do these things if he makes religion a part of his farm life.

CHAPTER XXII

THE COUNTRY GRAVEYARD

A STRANGE and gruesome title for a chapter in a book upon the business of farming, most readers will think or exclaim when their eyes rest upon it, and yet the author believes that the reader will reach the conclusion ere he finishes reading this chapter, that the country graveyard has as much of a place in the business of farming as has the beautiful surrounding or sanitation of the farm.

We should remember the beautiful sentiment expressed in the words, "We pass this way but once," and so it is our duty to do everything possible to lighten the burdens of our loved ones and our fellow man.

Pleasant and pleasing surroundings make life worth while, cultivates a respect for society and its laws, instills into our hearts that there is a Maker who rules the universe, shapes our destinies and our ends.

Cities are crowded because they are made beautiful. Broad, well paved and lighted streets, parks and cemeteries with the wilds of Nature improved, aided and polished by the hand of man, are an everlasting delight to the eye and a balm to our tired and hurt minds. So people love them and are willing to undergo any hardship to be close to them.



THE NEGLECTED COUNTRY GRAVEYARD.

The disgrace of the business of farming. One of the number of conditions that drive men and women from the farm.

Though bowed with cruel grief, yet is there not a pleasure in being able to lay our loved ones who have lived out life's fitful dream in the beautiful, well kept, flower laden cemetery, with the knowledge that, through the years, though we be far away, it will always be well cared for?

Oh! the tragedy and the sadness of the country graveyard! A disgrace to the American farmer that ought to make him blush with shame.

There is not a farm community in all this broad land of ours but what contains this disgrace. We see these yards grown up with weeds and underbrush until we can scarcely see through them to the tottering tombstone, upon which is inscribed, "Sacred to the Memory," a mockery to the dead, a stinging disgrace to the living. Is it any wonder that men and women fear death, knowing that their bodies are to be laid in such neglected places?

The author's parents are sleeping in a beautiful city cemetery, although they were pioneers and lived their lives upon the farm. A brother and sister died more than a half century ago, and were laid in a neglected country churchyard. They died in early pioneer days when our parents were busy clearing the forests and making the wilderness to bloom and fruit with the products of the husbandman. The struggle our pioneers were compelled to undergo led to neglect in many of the things of life. So it is not strange that the graveyard was neglected. When the last parent died the author went back to the ancestral home from which he had wandered years before. Those are the times when family ties are strengthened and family

memories are revived. So the thought of the loved ones gone before became uppermost in the minds of the living and they thought it would be fitting to wander back to the old country graveyard where the brother and sister slept, and have their remains moved to the beautiful city cemetery where our parents were laid to rest.

But what was the author's sorrow to be brought face to face with the awful truth that in this neglected country graveyard we could not even find the depression of the narrow short mounds under which had lain for so many years the sleeping bodies of those who helped make up the family circle of our youth, that period the best of our lives.

Not many miles from the author's home is a farm that was rescued from the wilderness by a pioneer who raised a large family. He and his wife, several of his children and a few other relatives, were laid to rest in a lonely spot upon the farm. In the course of years the farm passed into the hands of strangers. In passing this farm not long since the author saw the tombstones of the little family cemetery piled around the last remaining tree of the forests of pioneer days upon the farm, and the mounds covering the sleeping bodies of the pioneers had been leveled and turned into a part of the adjoining field, and was being cultivated. What sacrilege! What a thoughtlessness of the living for the dead! It is no wonder that a farm community, dotted with ill kept, uninteresting homes, dilapidated, neglected graveyards, are deserted by the young girls and boys.

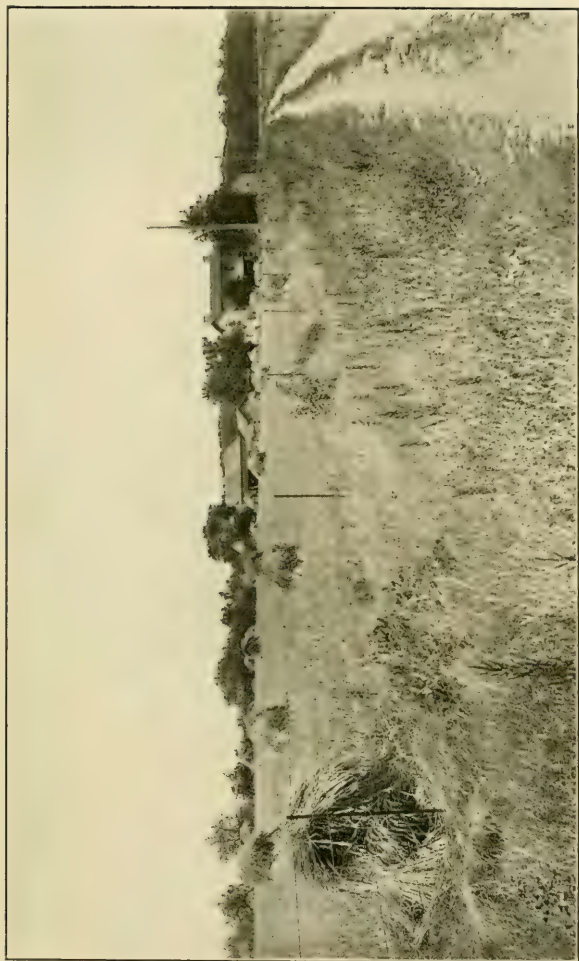
If we have no respect for, or remembrance of

the dead, let us at least respect ourselves and make our lives and the lives of our loved ones more pleasant, and clean up and beautify the country graveyards and make them, not only a fitting place for the sleeping dead, but places that delight the eye. It will greatly assist in making farm life worth while. It will give us the spirit of improvement of home surroundings that will help to solve the problem of keeping the girl and boy on the farm.

CHAPTER XXIII

HOME BUILDING AND THE FARM

MAN is the most pronounced home loving animal, for he devotes his greatest energy to home building and home adornment. If possessed of large means he builds for his home palaces and castles "domed and turreted" and surrounded by spacious grounds gloriously parked by Nature and human hands. If possessed of moderate means he builds the average home, pleasing, pleasant and of modest design. If his means be meager he constructs the little cottage and adorns it with the clinging vine, the simple furnishings and surroundings. In either home he finds the sacred refuge of life from the storms without. In the palace or most pretentious home he does not always find the abiding place of true affections and the sacred refuge of rest. Neither does he always find them in the humble cottage. But home is his greatest solace and comfort. He gives up his life in service for it. Take home out of man's life and what is left for which it is worthy to fight and strive and endure? The young man and woman in early life begin to look out and beyond the vision of their childhood's home for their future home vision, and home life, and if they catch the vision of home it generally is the vision of the palace or more pre-



THE OLD FARM HOME AT THE TURN OF THE ROAD.

This old farm home is set amid beautiful and peaceful surroundings where comfort and plenty abound. Yet it was abandoned by its former owner for city life. We often wonder if he has ever regretted the change.

tentious home with the most beautiful surroundings. If their childhood's home is a hovel the vision of the home they see in their dreaming is not of the hovel kind.

While we have seen the home instinct so strongly developed in the young, that a young man seriously injured in the marts of trade piteously pleaded that we take him to his childhood's home which we found to be nothing but a two roomed hovel, reeking with filth and the walls alive with foul crawling vermin that dropped from the ceiling upon us as our footsteps shook this hovel mis-named home, yet we dare say that when this young man dreamed of the future home, he would have for his own, his dreaming did not picture the kind of a home his parents had given him, but was that of a palace or the beautiful ones he saw in his neighborhood.

One day at the World's Fair at Chicago in 1893, the author found himself in the great art exhibit standing with a large crowd gazing with moistened eyes at the simple picture of farm life entitled "Breaking Home Ties." It represented a farm home scene with the mother bidding adieu to the young man about to leave the farm. The father with sad face was waiting with the farm team to take him away; the smaller brother and the farm dog were looking on with apparent sorrow.

After standing for a long time looking through tears at this simple picture he turned about and saw dozens of men and women with weeping eyes and with tear stained cheeks looking at the picture as the author had looked. Why the interest and tears for a simple picture? It represented the

life's history of the author and those men and women.

There was a time in the author's life when he too stood on the old farm porch, bid mother an affectionate adieu, and with her blessing and admonition set his face towards the city and entered its life, and these men and women standing about him had at some time in their lives done the same thing.

But why did the author break the home ties of the old farm home? He had caught the vision of a more beautiful home with better and more pleasing surroundings than he saw upon the farm, which he wished to possess for his manhood's home.

Let us for a while review conditions that obtained upon the farm during the early life of the author, and which have obtained in the lives of thousands of others, and see if we can not find the solution of some of the most serious problems of to-day that beset the business of farming.

Upon the farm little attention was paid to home building. The country was new, farm machinery was crude and undeveloped, muscle and brawn were required to clear, ditch, cultivate and improve the land. Public improvements were a hard drain upon the farmer's finances. Price of farm produce was low, and the prices of the merchandise the farmer required was high. Conditions were such that it required long hours of hard work to make ends meet. It was the age of brawn in every business as the age of improved machinery had not been born, so country and city developed

slowly, even the dress of those engaged in the business of farming was so distinctive as to excite ridicule.

This condition of the business of farming threw a certain environment about those engaged in it that they continued in the same old rut, even when conditions changed and greater opportunities were possible upon the farm.

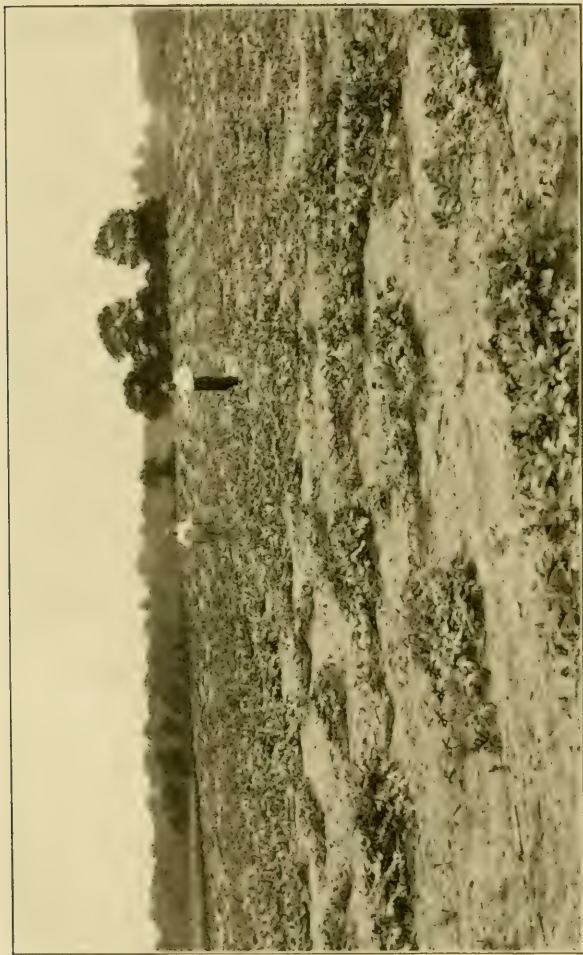
The young man or woman reared under these environments, without any education that led them out into the delights and possibilities of the business, got out enough into the world to see that there was another class of men and women engaged in different business, wearing a more pleasing dress, possessing beautiful looking homes, and apparent prosperous business; that these men and women were leaders of men and women, as lawyers, physicians, clergymen, merchant princes, etc. They had never heard the merits or possibilities of the business of farming exalted either in home, school or elsewhere. It was not thought possible for those on the farm to be as well dressed as people in other lines of business, and so the business of farming was generally condemned and looked upon with ridicule and contempt. Even the literature and art of the day portrayed and pictured the men, women, and children engaged in the business of farming in the most slurring manner. The written eloquence of the great lawyers and statesmen and their pictures in action, was the literature and art found in both schoolhouse and home. Is it any wonder that the young man upon the farm early in his life began to dream of the

forum or the legislative halls, and longed for the day when he would be a great lawyer or a great statesman?

The business that pays the greatest profit and gives the greatest opportunities for home building is the business most sought after by our people. In every line of business the people who are engaged in it do the things they see their neighbors do which brings the greatest profit.

If a farmer produces a certain crop one year that pays large returns, all his neighbors imitate him the next season and raise the same crop. Boys and girls are imitative. They want to imitate the higher types of men and women, but unless rightly guided too often mistake the higher type. They want to do what men and women do which seems to them will bring the greatest joy and happiness. If when they go to a city they scarcely look at the hovel or poorer districts where poverty abounds, they see the beautiful parked streets with the magnificent residences richly furnished within and adorned without. And the better dressed men and women only impress them, and they immediately begin to dream of these and plan to engage in the business that will make such things possible for them to acquire.

As the author was penning these lines his attention was called to the newspaper report of a large Sunday men's meeting in the Capital City of his state. There were fifteen hundred men at this meeting. The speaker's subject was the "Country Boy." The speaker began his remarks by asking all the men in the audience who were reared



IT WILL SOON BE "GOOD OLD WATERMELON TIME."

Forget not to grow the "fruit of the vine" upon your farms. They are easy to grow and there is nothing that will give the pleasure that is given by the "Watermelon Patch." Our most pleasant memories are those of the "Melon episodes and days" of the spring-time of our lives.

in the country to stand up. All stood up but less than two hundred.

Line up the city business and professional men of any of our cities and ask them from whence they came, the majority will say from the farm. Ask them why they left the farm, they will answer, to secure the greater opportunity. Ask them if this greater opportunity was not out upon the farm, and they will answer that if it was, their training and education had obscured it, and their vision did not catch it, but their education and observation pointed it out to them in the city.

The author obtained his early education in a small country town which depended entirely upon the country for its support. He went through the several grades of its schools and graduated from its high school. There never was a time in all his schooling in this town, depending for its very existence upon the business of farming surrounding it, that he ever heard so much as an intimation that the business of farming was a desirable one to follow.

But the business of the professions, especially that of the law, were being constantly held up as the most honorable and the most worthy for which the young man should aspire. Is it any wonder that he and his country boy associates so easily drifted into city life? On his way to school he passed the pretentious homes of the city editor, merchant, lawyer and doctor, and dreamed of the time when he too might be an editor, a merchant, lawyer or physician, and occupy such homes which seemed to him then as great mansions.

Those were the days of bad country roads and

one-half of the year they were almost impassable, and as farm homes were generally far apart, the isolation of country life was keenly felt.

But we are now living in an age of changed conditions. Our farm lands generally are so settled up that farm homes dot the landscapes, and most every farmer can stand in his doorway and see many homes. Our bad roads have become improved highways. The automobile has eliminated distance. The telephone and rural mail brings the best of civilization at every farm fireside. Distance, isolation, lonesomeness, are eliminated from the farm.

We have already shown that there is not a single city convenience but what is available for the farm.

Electric light, practicable, cheap and substantial, lights the farmer's home, eliminating the drudgery of taking care of dirty, ill smelling, and unsatisfactory coal oil lamps. Devices for lifting and distributing water about the farm can be obtained which do the work as cheaply and satisfactorily as any city water system. And if the farmer but possesses a spring or flowing well, as many do, the hydraulic ram will distribute water about his premises practically free of cost. The gasoline engine, now so cheap that any farmer can afford one, will relieve the labor of pumping water and grinding feed for stock, and do a large amount of other farm labor that once required brawn and long hours of labor to perform.

An outfit consisting of a vacuum cleaner, dustless mop, fireless cooker, washing machine and wringer, a gasoline engine and gasoline iron, all costing less than one hundred dollars, can be in-

stalled in the farm home with which the house wife can accomplish twice as much work in half the time, and twice as easily as she could herself do even with the help of a servant.

With such an outfit the farm wife can keep her household in perfect order, and have much time to use as her fancy dictates, and household work upon the farm becomes no more irksome than it is in the city or village.

With the great number of labor saving devices and perfected machinery now available for every farm, and at such prices that every farmer can afford to own them, the farmer and his family have more spare time than ever before known to the farm, so they can spend the extra time in the adornment of their home surroundings. The beautifully kept lawn, with its cement walks, well arranged and cared for shrubbery and flower beds, is just as possible for the farmyard as the city home. The country garden and orchard, well kept, filled with every vegetable and fruit possible to grow in the locality where situated, can not only be made a source of profit, but an everlasting delight to the senses of sight and taste.

In fine, the possibilities for home building upon the farm are just as great, and at prices within the reach of every man engaged in the business, as you will find in any city or town. There is no longer any excuse to go to town to possess conveniences or escape labor, which have so frequently been urged in the past for farm desertion. And just as sure as the men engaged in the business of farming begin to put these possibilities into realities upon the farm, see that the educa-

tional institutions to which they send their children to school teach them those things that get them interested in nature and farm life, in fine, give them the agricultural and domestic science training, and that their children are dressed as well as finances will justify, then the stream of young men and women flowing towards the city will be stayed.

But the farmer must himself get the spirit of better farming done under better conditions of improved labor saving devices and farm machinery. He must get in love with his soil as well as with his family and do the things that will feed it and improve it, and then get in touch with the better farming methods by which he can grow the better and larger crops, in fine, do the intensive farming in all its lines that brings the greater profit and the better farm living.

The possibilities of home building and the opportunities for better living and profit were never so great upon the farm as now. Make these possibilities and opportunities realities, surround the farm homes with all the comforts and adornments of the city home, and you have solved the question of keeping the boy and girl on the farm.

Remember that it does not require the mansion upon the farm to bring the better living, but the modest, simple cottage or bungalow surrounded with the adornments of beautiful lawns set with shrubbery, vine and well kept gardens and orchards, and furnished inside with the labor saving devices and the comforts and pleasures of good household appointments, libraries, and musical devices, is enough. The simplest home can be so

adorned and furnished as to give the greatest delights of living.

But above all do not forget the country church, the bettered school and the right social diversions. If all these things do not give the better living and greater than any found in the city, then there is something wrong with the country liver. The men or women themselves are not right. The fleeting pleasures of the world have so poisoned their minds that "simple pleasures no longer please." "They are joined to idols" and we are forced to let them alone, at least until by bitter experience they have been made to see their folly.

Some may ask the question, "If the farms are all occupied with homes, where is there room for more?" We have already shown in the chapter on Back to the Land that there is yet much room for home building, and there is still the greater opportunity in our best farming districts for many farms are already too large. Reduce the size of our farms and do intensive farming of our lands which will bring the greater profit. The farmer with 160 or more acres can divide his farm into eighty acre tracts, give his children the chance to make a home upon it which, if farmed intensively, will yield as great a profit as double the acreage found by the old methods. This method will make room for many of the children coming on into adult life.

It is conceded that the small farm yields more to the acre than the large one. That the farming of small tracts of land leads to intensive and better farming and to increased fertility. That the small farm occupied by industrious families is

the real backbone of any nation, for it not only reduces farming to a science, but leads to coöperation that will uplift the business of farming, and will lead to the elimination of the waste long practiced upon the farm. In fine, it means to any nation that its people will be better fed, better clothed, better housed, yea, will have a better life.

More than one and one-third millions of immigrants came to our shores in the year 1913, and nearly a million of these were males. Nearly one-half of these men were farmers and farm laborers. Yet less than two per cent. of these landed upon the farm. The cities swallowed the remainder and augmented their congestion of city workers. If this condition continues to obtain in the future, and the drifting of our own farming class continues towards the city, the labor and other problems of our cities and country districts will become so acute that relief must be obtained in some way.

The duty of the hour is to demonstrate that the opportunity of the farm for home building and better living, is as great as can be found in any city.

It is useless to longer sound the warnings of the dangers that beset us. It is now time for action. There must be some concerted action by and between national, state and city governments, railroads, agricultural or other societies, towards the putting into execution of some plan that will restore the equilibrium of proper population between cities and farm districts.

We will never be able to keep all the boys and girls upon the farm, yet if we show them the possibilities of the farm in all the lines of profit, home

building, and the things that make up the right living, the larger number will not only remain upon the farm, but thousands who have gone to the cities will return to the farm.

We have but to show the boys, girls, men and women what the farm is capable of doing and the readjustment will take care of itself.

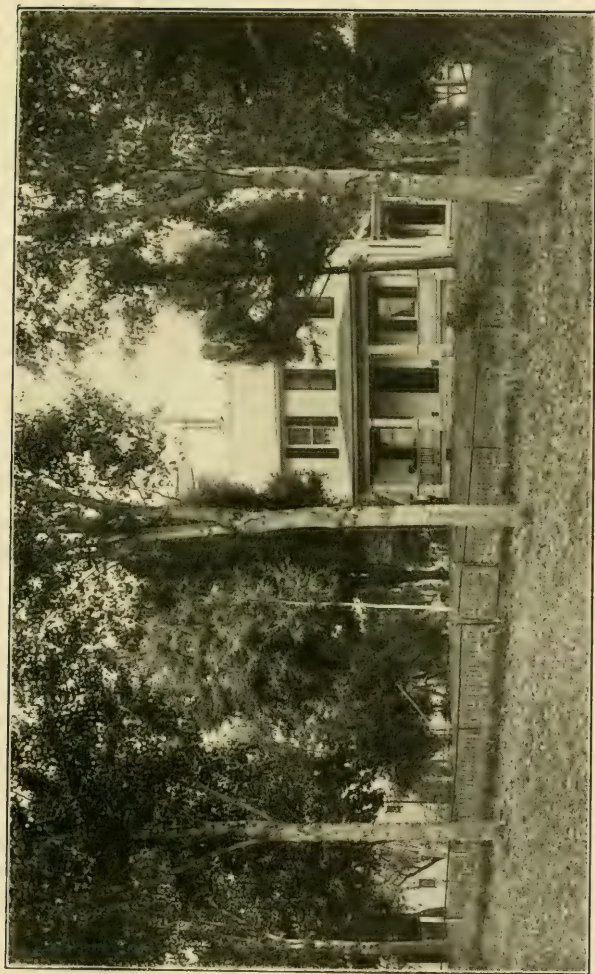
CHAPTER XXIV

BACK TO THE LAND

VOLUMES have been written upon this subject. Some true and sensible things have been said about it, but much that has been written gives no practicable suggestions.

There is no city man or woman who came from the farm but what has a yearning to "wander back again" to the land to be touched with Nature's charms. And many men and women who never knew country life also yearn to throw off the burden of city life for the freer country existence. And yet but a small per cent. of this dreaming ever becomes a reality. Many who once get hold of city or town existence cannot let loose, and the probabilities are that many of them would make a failure of the business of farming if they could loosen their grip on city life and get back to the land.

By instinct man is a social animal and is ever seeking to be amused. He delights in stimulation and excitement, in the weird, the mystery. This trait in man is susceptible to cultivation by mental processes. Let his mind run even lightly in that direction and he reaches that state where life is as a dreary waste, unless he has an opportunity to indulge in those things that stimulate and excite his many senses.



THE COMFORTABLE COUNTRY RESIDENCE OF A CITY DOCTOR WHO
WENT "BACK TO THE FARM" AND MADE GOOD.

It seems that the average American has gone amusement mad. His main object in life is the insatiate search for amusement. When a man or woman allows themselves to be stricken with this malady, the peaceful quiet restful life of the farm has no power over them. To this life they are irretrievably lost.

The discontent with farm life can in most every instance be traced to this trait of man and accounts in a large measure for the breaking of farm ties.

The isolation and lonesomeness of farm life in these days of telephones, rural mail routes, the automobile and an abundance of varied literature, have their existence only in the mind, and so cannot be responsible for the discontent with farm life. We do not have to go to the remote parts of the country to find isolation and lonesomeness. They are found in the most acute stage in the best cities, for where can one find the counterpart to the awful isolation and lonesomeness of one in the city without friends or money, or without work, a business, trade, or profession with which to supply the necessaries of life. Yet there are thousands of men and women who would rather live in the city, endure its galling poverty and distress, so as to be near the maddening excitement found on city streets, rather than go back to the land and plenty, with its quiet and peaceful rest and freedom from worry.

But there are thousands of city people who ought to be on the farm and who want to be for they know too well that it is a most difficult thing to rear and train children properly under city influence and environment, for no matter what the

home training may be the outside evil influences found on every hand in our cities tear down faster than we can build up. Our cities are so congested with workers that the conditions of labor are such that we have vast hordes of the underpaid, and underfed, and even where labor in plenty is to be obtained it is done under conditions that too often leads to overwork.

The high cost of living lays its galling yoke upon the city laboring man and even upon the middle merchant or business and professional class, and the constant chafing of the yoke makes existence such a burden that even hope befriends and ceases to be the chief and universal cure for the "ills that men endure."

We should not deceive ourselves in the belief that all the misery occasioned by the "heavy grind" of life or high cost of living in the city is found among our laboring classes. You find it largely among the business and professional classes. Most of us never know the awful struggle for bread and even existence, that is constantly taking place among these classes. It is easily seen among the laboring class, but with the business or professional men and women it is concealed beneath the veneer of prosperity with which this class seem to be able to cover themselves and appear to the world as prosperous. But we who have been able to lift this veneer have seen the conditions that would startle, and show that the majority of city people are paying an awful penalty for the privilege of city existence.

When we see the gray hairs, the wrinkled fore-

head and the sad face of the city men and women it too often means that they are bearing the heavy burdens of the struggle for bread, and are paying too great a penalty for the privilege of city life. And these conditions are bound to grow more acute in this land of ours because we have almost reached the end of newer lands being opened for settlement, and our lands now under cultivation will enhance in value until they will be owned by the wealthier class and so the man without means will be unable to obtain land and will be forced to endure city existence.

Then too many city men are the round pegs trying to fit themselves into the square holes. Nearly half the men who are trying to transact city business in all branches of trade and the professions are without sufficient ability to perform the duties their business requires. The author has seen scores of professional men who could not successfully practice their professions and what was more distressing would never be able to learn how to do so. The same condition obtains in all lines of city business and we are willing to admit that many of these men could not successfully transact the duties required of the business of farming so as to be successful. This fact makes it harder to advise correctly upon the "back to the farm" movement.

Several propositions are established. There are too many people in our cities.

There are too many city people in distressed conditions. The burden of life or the struggle for bread is too great for them to bear.

If these city people could get back to the land much of their burdens could be, and would be relieved.

To establish these people upon the land does not require a large amount of land for each individual family.

A five or ten acre tract of land farmed and managed in the proper manner would provide at the closest estimate as large an income as many of those families have been receiving in the cities, and as their expenses in the country would be so greatly curtailed they would live better than in the city, besides enjoying the other advantages of country life.

There are fine opportunities for money making in the farming of small tracts of land near most every city. The rearing of poultry, growing of small fruits and vegetables, is a most profitable business and does not require large tracts of land to carry it on.

There is much land in the eastern, middle, and southern states, susceptible of great possibilities in the back to the land movement. Many city people have made, and are now making good on these lands, and have relieved themselves of the city grind, and now endure a pleasing existence. True they have met with discouragement, and it has taken grit and determination to hang on and make good, but with courage and work and study, most any person can establish themselves upon this land and can soon enjoy the glorious privilege of country existence, provided they had some capital with which to make the start.

So the hardest problem to solve in this back to

the land movement is securing the requisite capital with which to get back. While it does not require a large amount of capital, yet the amount necessary in each individual case, is large to him who has no means or can give no security to secure the means necessary. There are many who are now in position to secure the capital requisite who, if they put off the day of getting back to the land, may, in the meantime, spend the capital now at their command. My advice to such is do not procrastinate but go at once.

Every person who has not a sure footing in the city, in a business sense, or reaches that stage where he sees his city footing slipping away, ought to make every effort to get back to the land before it is too late, for it is as true as Holy Writ, that he who once loses his grip on city life and business, seldom, if ever, gets his grip again. Every city is full of men past the middle age of life who have lost their grip. Their positions have slipped away by reason of age, incompetency, or the crowding out process, and they are now members of that great army of derelicts upon the sea of city business, drifting hither and thither without sail or compass, unable to make a safe and secure harbor.

This is the great city tragedy that can only be cleared away by landing these derelicts upon the smaller farms. And the study and adaptation of a plan by which it can be done is the greatest and most philanthropic work that can engage any mind or capital. For the doing of this thing will relieve much of the distress and misery of the city, and contributes much to the greatness of our

country, for the man who has once lost hope and courage, and can be established back to the land where he can regain them, and a pleasing existence besides, becomes a valuable citizen, and the nation of valuable citizens is the most powerful and prosperous.

Here is a field for the organization of honest companies whose purpose is to buy up vast tracts of land, divide it up into small tracts, develop a scheme by which money can be loaned to settlers upon plans similar to those adopted by city Building & Loan Associations, who loan money on such liberal terms that thousands of city people have been enabled to purchase and pay for homes, and which loans have always been safe and profitable investments to both loaner and purchaser. The same thing is being done successfully in Canada to-day and is enabling many to get back to the land.

This proposition of getting back to the land is suitable and practicable to both sexes. There are scores of women to-day who have even gone back to the abandoned lands of the eastern states and established themselves upon the worn-out soils and rescued these soils and brought them back to themselves again, and these lands are giving to these settlers peace, plenty and a happy existence.

There is scarce a community but what there are some opportunities for men and women to get back to some portion of the soil; if it is nothing more than a half acre or more, it will do much to relieve distress occasioned by the city struggle for bread.

To get as much as possible of the struggling

hordes of our city back to the land means not only that a large portion of our people can

“Hold fast the golden mean,
And live contentedly between
The little and the great,
And feel not the wants that pinch the poor,”

but will mean so much to our nation, and will help to solve so many of the problems that now beset us.

But the financial scheme for supplying funds for the back to the land movement must have for its basis a long time payment plan, and yet should require the yearly payment of interest and a small amount of principal. For the first gives hope and courage, and the latter induces thrift and economy. The city man going back to the farm may have had no farm experience and even if he had, conditions now may be entirely different from what they were when he did farm, so time must be given for him to get into touch with the real business of farming so as to avoid mistakes and hindrances.

Again no company should attempt to finance a back to the land movement without providing for distribution of an abundance of sane agricultural literature written in plain, easy to understand English, and along common sense lines by those who have had practical experience in real soil building, soil maintenance and crop growing, for false undigested theoretically written farm knowledge would do vast harm to the raw recruit upon the land.

If farm experts of the right sort could be fur-

nished it would be a mighty aid, for there is nothing like the personal touch in this matter of teaching the business of farming.

Generally the first question asked in this back to the land movement is, Where shall we go? We have already stated that there are many opportunities to be found in most every section of our country, but the best and most promising for the man not afraid of work and study is to be found in northern Minnesota, Wisconsin, Michigan and parts of Virginia. While the lands found in these sections are mostly "cut over" lands, yet the soil is rich and produces crops in abundance and the lands are cheap. There are vast tracts of land in Virginia covered with timber that is now being cut off by large milling companies that can be purchased at from ten to twelve dollars per acre. These lands are close to railroads, excellent highways and markets. The climate is ideal, rainfall is ample and the soil is good and suitable for fruit and alfalfa growing, in fine, for most any crop. And there are great possibilities even in the worn soil districts of the east, for the rebuilding of worn soil is not a difficult problem. And our southland should not be overlooked. In fine, the supply of lands for this back to the land movement are ample for a large population if we but look about us for them. The main problem is to finance the movement and get the stream moving back from the city, and safeguard it with the education and training, and the helping hand that will prevent the stream from turning back again towards the city.

It will not turn back if those who get back to the land can once get established, for no sane man

or woman who once escapes the city grind and struggle for bread and becomes attached to the soil would ever want to become entangled in its chafing meshes again.

The government at Washington is making the effort to study out and put into execution a plan of farm credits which will help to supply the requisite capital to our farmers and it is to be hoped it will in a measure at least, also solve the problem of financing this back to the land movement.

A pleasing experience of a young man and his wife who got back to the land came under the author's observation during the last three years, the reciting of which may give the reader courage and hope if he or she is contemplating the joining of this movement.

Five years ago a girl friend of the author, reared in the country, married a city young man who knew nothing of country life from experience. They became residents of a large city, he being in the employ of a mercantile agency. Two years of city married life too plainly told them that the city struggle for bread would be difficult, and if they ever intended to secure a firm footing in life, the farm was the place to secure it. They were able to secure funds sufficient to buy a small farm of about sixty acres of worn-out soil situated in southern Indiana. The place had been so neglected that it was almost an abandoned farm, both as to buildings and land. They made the start, bought the land and began the business of farming. The young wife visited the author a short time ago and she told of their struggles in their new business of farming. How the vicissitudes of dry

weather, insect pest, worn soil, lack of money to secure help, and inexperience had presented problems for them to solve that tested their courage and almost overwhelmed them. Her husband knew nothing about handling farm tools and horses, and she laughingly told how she had ridden the horse astride, hitched to the plow, with her husband a hold of the plow handles guiding the plow, and she all the time fearful some one would see them in this uncommon situation. But this young couple had grit; they stuck, and with the enthusiasm of a young child she told how they had surmounted all discouragements and had made them a pleasant home and had the comforts of life with the freedom of country life and free from the uncertainties of city life. She said they were happier and freer from care than they had ever been and would not exchange their present condition for the city life again. That each day upon their little farm their difficult problems were becoming less difficult. Their farm was being built up, and was reciprocating for the care given it. And while the author was writing this little story about the young couple a letter came from the wife stating that they were never more intensely interested in farm life than now, and that her husband was constantly reading farm books and that they were "still the happy country kids."

This little story also shows that many city people can get back to the farm if they want to get back, and that they can stay on the farm when they do get back if they really want to stay.

But every one who is contemplating getting back to the land must remember that if he or she

realizes their dream, it means that they must possess a faith, a hope, a courage that brooks every discouragement, for discouragements will come thick and fast, but the man or woman with the grip that never loosens will achieve the success of a competency, and a better living amid peaceful and pleasing surroundings and an uplifting environment.

It is said that people do not go back to the land, for fear of failure and of land sharks, or the real estate agent who sells worthless land above its value. The pitfalls of both these reasons can be avoided, and our agriculture departments in both state and nation can furnish the remedies. And as we have already said, the right sort of literature and the expert government agent can show how to farm or how to avoid the failures.

The good and the bad lands can be listed and brought to the attention of the would be settlers, but of course there will be failures in spite of every precaution. And this is true of any business. We can only take the steps that will reduce the failure and other hindrances to the minimum.

The author recently read this statement from a writer upon the back to the land movement. "Unless you are satisfied to be just an ordinary common every day man and willing to mingle with that class of people for the rest of your life, I certainly advise you to keep out of a pair of plow handles. I never knew a millionaire farmer in my life." And then he went on and asked the questions along this line. How many farmers did you ever know who took trips to Europe, or the seaside, played golf, or stopped at a high price

hotel, or, in fine, ever participated in the pleasures of the rich? And well might we ask, how many city people do these things? For it is a fact that three-fourths of the city people are engaged in a fearful struggle for bread, who never do or never can enjoy the so called pleasures of the rich, and even in their condition they are a thousand times better off that they are not able to do so.

We have already shown that the trouble with too many people is they think of nothing else but pleasure seeking. They forget that our mission in this world is one of service. That God intended that the most of us should be of the common herd for, as Lincoln said, he made so many of just plain common people.

If we would just adjust our mental state along the right lines we would know that there is more genuine pleasure and joy in living found right among the common every day man upon the farm than in the city, and the author would rather live with, and be one of the common every day men, whether situated in the city or country than to be one of, and live with the idle rich that flitter hither and thither in search of a happiness they do not find, and can never find in the life they are living.

Riches never have, and never will be the means of securing happiness, for happiness is largely a mental state. We must adjust our minds right before we are first in position to secure it. Then having got into the right mental state, we will find it in simple living and in a "conscience clear, a mind at ease, and simple pleasures that always please." Add to this plenty of work amid pleasant surroundings, especially the surroundings that

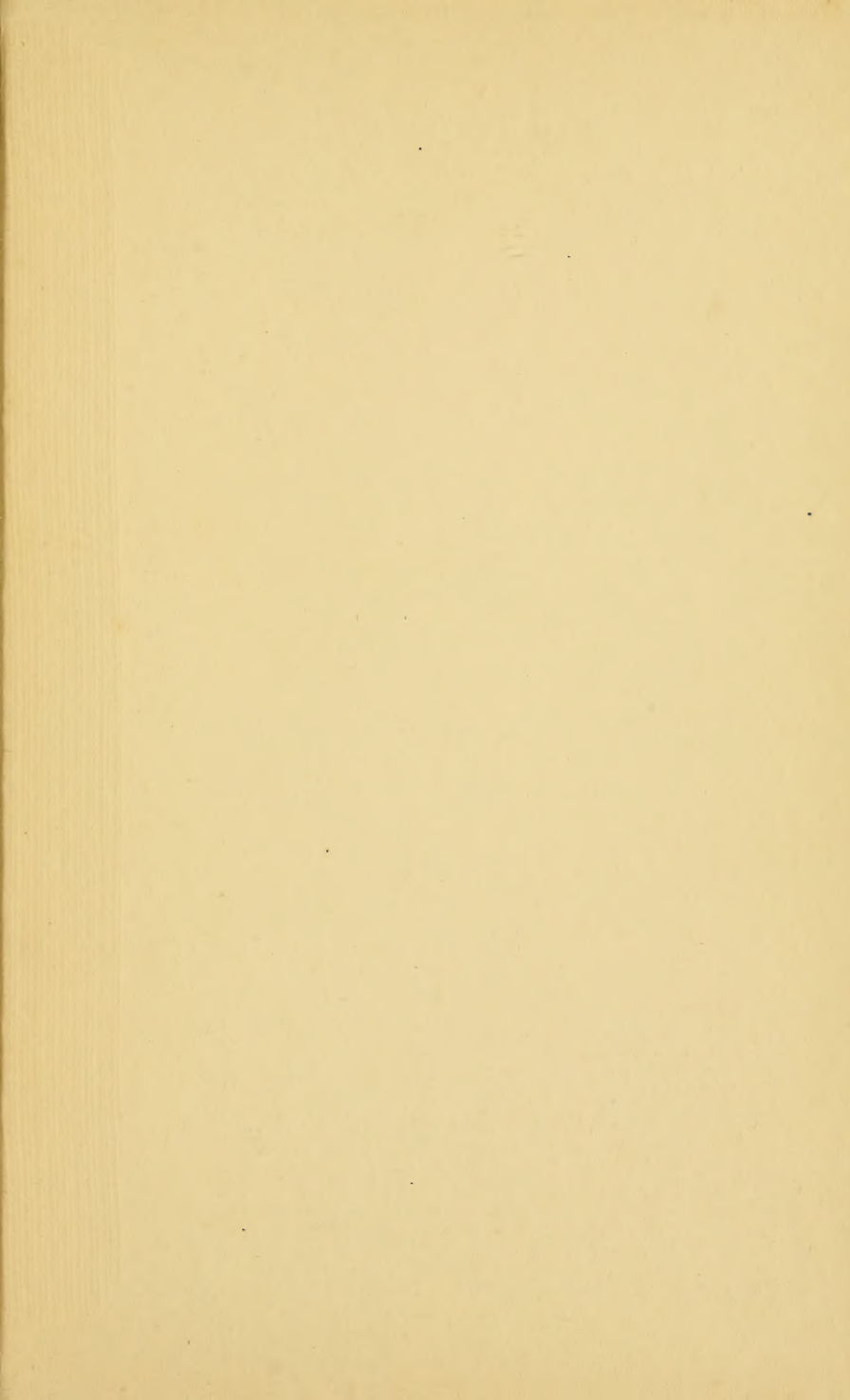
partake of the business of farming, with a sufficient wage, and with the idea impressed upon our minds that our lives should be lives of service, we will then find ourselves better off for mingling with the common every day men and women, and thank God that we are of the common people.

The author has lived in the rich corn belt of Indiana all of the fifty-seven years of his life. He was born on a pioneer farm that had only been settled for fifteen years before his birth. He has ever mingled with the farming class and has known the financial status of hundreds of farmers. He knows how the farmers of the corn belt are prospering. He knows of scores of farmers who were worth from twenty-five to one hundred and fifty thousand dollars, and he knows that the vast majority of these farmers of our best lands possess a competence, are better housed, fed, and dressed, and have greater opportunities for possessing happiness than you find in the city.

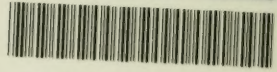
He is firm in the faith that the greater opportunity to find peace, plenty and happiness, is to be found on the farm. He concedes that many will not be able to find it there, neither will they likely find it in the city.

After all that you can say upon this subject it resolves itself up to the man or woman. No one can tell you how to get back to the land so that you can just go out and lay your hand upon the opportunity of better living and just stop there. You are still the architects of your own fortune. The way may be laid out before you so you can see clearly down the road to the reality beyond, but you must go down the road yourself and pos-

sess it. And you may find the road long and dusty. If you have not the qualities that achieve and possess, you will surely succumb to discouragement and fall by the wayside. But the fighting man or woman will achieve and possess.



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