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Issued August 26, 1910.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY—Circular No. 64.
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AGRICULTURAL CONDITIONS IN
SOUTHERN NEW YORK.

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[Cir. 64]

AGRICULTURAL CONDITIONS IN SOUTHERN NEW YORK.

NONPRODUCTIVE AGRICULTURAL LAND IN NEW YORK.

The nonproductive agricultural land of New York State has aroused much interest and considerable discussion during the past two or three years. Not everyone who has entered into this discussion has had a clear idea either of the meaning of the situation or of the extent to which this condition prevails. The term “abandoned farm” fre-



FIG. 1.—An abandoned set of farm buildings in southern New York.

quently heard in connection with these lands is purely a relative one, and in but few cases should it be taken literally. There is no agricultural land in New York State which is not claimed, and it seldom even happens that land is sold for taxes. The term must obviously be qualified. In certain sections of the State, buildings are partially or wholly abandoned (see fig. 1); in others, the houses are abandoned as homes. In some, the barns serve merely as storage for hay and a few implements. Again, many fields and, in a few cases, entire farms

have been abandoned for farming purposes. No crops are grown; little or no stock is kept; weeds and waste have full possession. Nevertheless, some one owns the land and buildings, pays the taxes, and asks a price for transfer, although he is usually willing to sell. Then, if these farms are described as agriculturally abandoned or as nonproductive agricultural land, the situation will be better understood.

LOCATION OF THE UNPRODUCTIVE LANDS.

Broadly speaking, the areas commonly referred to as abandoned land lie on the tops of the hills in the rather wide belt extending from Chautauqua County in the southwest through parts of the counties of Cattaraugus, Allegany, and Steuben, through the southern part of Erie, Wyoming, Livingston, and Yates counties, and through Schuyler,



FIG. 2.—View showing the general topography of the land on the hilltops of southern New York.

Chemung, Tompkins, Tioga, Cortland, Broome, Chenango, Otsego, and southern Madison to Schoharie and Albany counties. The parts of this area which are in the condition described constitute but a small proportion of its total acreage. Many of the best farms of the State are located in these counties. Although their local topography varies somewhat, in general it is the same. Feeble glaciation has left high, rather steep hills, on the tops of which there are often considerable areas of fairly level to rolling lands. The water flow of many years has cut frequent and more or less deep valleys, usually running north and south. Thus it will be seen that the whole area is very much broken in its general outline.

The land on the top of the hills (fig. 2) was cleared of timber from sixty to one hundred years ago, depending somewhat on the locality.

Clearing began in the eastern part of the area some time before it did in the western. The original timber on the land was very largely pine and hemlock, with considerable oak, chestnut, and maple. Timber has now largely disappeared from the level hilltops, but is still found along the edges of the streams, the hard woods being most prominent.

The soils on these higher lands are mostly what are known as the Volusia loam and the Volusia silt loam and are composed largely of native rock. They are rather light in color and fine in texture, especially the silt loam, and there are mixed with them considerable quantities of broken shale rock. These soils are not infertile, but their physical condition is usually poor. The valley soils are usually gravelly loams composed of the wash from the hills, and as a rule are quite productive.

HISTORY OF THE UNPRODUCTIVE LANDS.

Wheat was the first market crop grown by the early settlers in southern New York, and the clearing of a piece of ground was usually followed at once by the sowing of this grain, and the following spring by the seeding of clover. A team of oxen or horses with a few head of cattle consumed the hay. Oats and barley soon came to be grown as well as wheat, and it was not long before corn and potatoes were added to these crops. This system of farming, with a few modifications, was followed up to the close of the civil war. Soon after this the competition with large areas of western grain lands began to be felt, and as the price of wheat fell the area devoted to it was reduced. Barley was substituted in its place, and this crop formed an important one up to about 1875 or 1880. As a rule, clover was still grown in connection with the barley, and the hay was fed to a few stock. In some sections sheep were kept. The price of barley soon became very low, and it was not long before the growing of any kind of grain for sale was practically abandoned.

About this time there began to be a market for hay. Unfortunately, the demand was principally for timothy, and clover was either used in smaller quantities in the seeding or was dropped altogether. Since timothy hay does not come to its best the first year, meadows were cut longer, and the time of leaving the meadow down was gradually lengthened until the timothy ran out and there was practically nothing but weeds left to cut.

A decline in the price of wool about 1890 made sheep raising unprofitable, and since there was then little market for mutton, a dual-purpose breed of sheep was not introduced, nor has it since been, except in a few instances. At that time cattle for beef could not be raised successfully in competition with the western ranches, and as the

market for dairy products was still limited and the price low, the growing of live stock was in large part abandoned.

Although most of the soils in this part of New York are excellently adapted to the growing of potatoes, but one or two sections have taken up the industry to any extent. Steuben County should be mentioned as one county in which potato growing has been greatly developed. The industry has also been begun in Broome County to some extent. It was thought, too, that corn could not be grown successfully at this elevation, and each year a smaller acreage has been planted. Buckwheat was early found to give good yields and has since come to be a leading crop. It is the crop from this type of land that gives New York first rank among the States in the value of the buckwheat crop. No other plant seems to thrive so well on these poorly managed farms.

Poor seed has been somewhat of a factor in the decline of the yields of many crops on this area. In a great majority of cases the seed has been poorly selected for years. Farmers have continued to use seed raised at home, frequently saving the poorer seeds for the next year's planting. Seed degeneration has continued, until at the present time it is practically impossible to get a crop of potatoes from local seed.

The maintenance of soil fertility has been given little attention. When clover was left out of the seeding no other fertility crop was substituted and the land went back rapidly. The greater part of the area has now come to be occupied by grass, and all the land plowed is that sown to buckwheat, except perhaps a few acres for corn and potatoes. All semblance of rotation has disappeared. But few stock are kept, because not enough roughage is grown to feed them during the winter and there is little money with which to purchase grain. In some cases commercial fertilizers have been resorted to, but since these were not supplemented with humus in some form they acted only as a temporary stimulus and left the land in a worse condition than before.

Among the important causes of the decline of agriculture in this region has been the lack of sufficient capital to make the necessary improvements, purchase needed equipment, and hire sufficient and competent labor. This is still a fundamental difficulty and is responsible for the slow development of the area when compared with other localities. It is at the root of the so-called labor difficulty. The farmer who is raising good crops and hence is making a good income is not confronted with a serious labor situation.

However fundamental these causes may have been in bringing about a decline of eastern farming, it should be noted also that there were other forces at work. The movement toward the West and the great development of the large cities during the past twenty years have

fostered and encouraged change and neglect in the East. In fact, many of these changes may be said to be the direct results of this movement, which has now not only reached its limits but has turned back eastward. Disorganization and abandonment have ceased; reorganization and reconstruction have begun.

FUNDAMENTAL PRINCIPLES OF IMPROVEMENT.

Enough evidence is at hand to support the belief that the agricultural conditions existing in southern New York are not necessary and that they are the results of poor or indifferent management. As pointed out in Bulletin 60 of the Bureau of Soils,^a the problem of soil improvement is purely one of a system of management. In almost any part of the region described, however bad, small areas of exactly the same type of soil and under the same general conditions may be found producing good crops. Moreover, fertility is not exhausted in these soils, as many suppose. The fact that 250 bushels of potatoes have been grown on a field abandoned for several years previously, without the use of any commercial fertilizer, is good evidence of this.

It is a fact, however, that the systems of the past have been largely those designed to get the most from the land during a given year regardless of the future, so that the plant food elements immediately available have been exhausted to a greater or less degree and the physical condition of the soil very seriously injured. Humus is the essential element, and whatever new systems of farming may be planned they must have for their first object the restoration of the physical condition of the soil by the addition of humus in some form.

GROWTH OF CLOVER.

One of the principal causes of the decreased supply of humus in the soil of this section is the running out of clover. No other plant is so important in any rotation for this region. This is because there is no other plant which can take its place as a producer of feed for stock, as green manure, or as a means of adding humus and improving physical soil conditions generally. Being a legume, clover adds some plant food to the soil. Both its deep root and heavy top growth add organic matter in considerable quantity. In addition, its deep root system opens up the soil to better aeration and better drainage.

Investigation has shown that clover does not grow on most of the area in southern New York at the present time, and moreover that it will not grow under existing conditions. It has been found that clover fails to grow for three principal reasons: (1) On account of

^a A Preliminary Report on the Volusia Soils, Their Problems and Management. Bulletin 60, Bureau of Soils, U. S. Dept. of Agriculture.

the poor physical condition of the soil; (2) because of the lack of humus; and (3) because of the soil acidity. Other reasons might be mentioned, but they are more or less dependent on those specified.

There are a number of instances where clover has been successfully grown on these lands after the conditions enumerated have been corrected. The method of procedure advocated in the following pages is based on that used in these successful cases.

PHYSICAL CONDITION OF THE SOIL.

A poor physical condition of the soil and its consequent loss of plant food are largely the result of bad management. While the soils in this region for the most part have a good surface drainage, the particles of which they are composed are so fine and the bed rock is often so close to the surface that it is difficult to get the water out of them. The constant removal of crops without the addition of manure has exhausted the organic matter of the soil. Then, too, very little or, at the most, very insufficient cultivation has been practiced. Consequently, the soils are compacted so closely that it is practically impossible either for air to get into the soil or for water to get out. This means that there is no more important factor in the improvement of these soils, especially at the first, than deep plowing and thorough cultivation. Tillage is a most efficient as well as cheap method of increasing the productivity of this land.

LACK OF HUMUS.

The absence of humus or decayed organic matter is, of course, the primary reason for the poor physical condition of the soil. There is nothing which will correct this condition more rapidly or more completely than the addition of barnyard manure, but here we find a serious problem. Without good forage crops, such as clover or corn, the farmer is unable to produce feed for a large number of stock. Consequently, the amount of manure available is very small.

Clover is the most desirable green manure, but it is difficult to grow this crop without the addition of manure. Therefore, it is usually necessary to resort to other crops at first. Since buckwheat grows readily on most of these soils and winter rye usually makes a good growth, these two crops seem to be the most available ones with which to get the first supply of organic matter.

NEED OF LIME.

It has been found that practically all of the soils of the type referred to in this paper respond readily to the use of lime. The poor drainage and compactness of the soil seem to have given rise to an acid condi-

tion, which must be corrected before clover can be readily grown. Forty years ago the use of land plaster was quite common upon most of these lands. At that time clover grew very well. As the use of land plaster was continued year after year so much lime was accumulated in the soil that the addition of more had no effect, and therefore its use was discontinued and has never been resumed. The result is that the available supply in the soil has become so low that the addition of lime is again necessary. This is best supplied now in the form of burned or crushed stone lime, which should usually be used at the rate of about 1,000 to 1,500 pounds per acre for the first application. (See fig. 3.)



FIG. 3.—Land in a poor physical condition, showing the effect of lime on a stand of clover. No lime was used on the left and practically no clover developed; 1,500 pounds per acre were used on the right, where a good stand is seen.

SPECIFIC RECOMMENDATIONS.

In planning definite cropping systems and outlining a practical system of farm management, the foregoing general principles must be kept thoroughly in mind. Successful farming is largely an adaptation to the conditions under which one is working. Unsuccessful farming is often due to a failure to make this adaptation, and this is one important reason for failures in this area.

Close observation and study of successful and unsuccessful crops and farm management on these lands point to two or three principal lines of development. These are the live-stock industries, the growing of fruit, and the conservation of the farm wood lot.^a Before either of the first two can be successfully practiced there must be developed an adaptable and self-sustaining crop rotation.

A CROPPING SYSTEM.

In planning a rotation of crops for these agriculturally neglected areas, the condition in which the land is at present and the means at hand with which to work must receive first consideration. Clover can not be grown at once. Stock can not be kept profitably until the feed with which to support them can be produced. Neither expensive teams nor implements can be purchased. There may not even be money enough on hand to buy new seed. Temporary repairs to buildings must answer the purpose. Little extra labor can be employed.

The first thing, then, will be to make the best use of the means at hand. Deeper plowing and thorough cultivation will be the first important step. Since buckwheat and rye grow well, the yields of these crops can undoubtedly be increased by a better preparation of the land. The grain will furnish feed for the team and a few head of stock. The straw should be conserved and, together with the small amount of manure produced, used on the corn or potato land for the following year. Possibly a part of the rye or buckwheat, if it does not promise well, may be plowed under as green manure. A cash crop will be of primary importance, for money must be obtained with which to purchase new seed corn, seed potatoes, grain and clover seed, and also lime to prepare the land for clover. Potatoes will in most cases be the best and most desirable cash crop. Only a small area can be planted the first year; therefore, much dependence must be placed on good, vigorous seed and the most thorough cultivation of land that has rested for a few years.

As soon as the potatoes are harvested, about 1,500 pounds of lime to the acre should be applied and worked into the soil thoroughly. Then the field should be seeded to rye and the following spring sown with about 8 pounds of medium-red and 4 pounds of alsike clover, together with 4 pounds of timothy and 4 pounds of redtop to the acre. After a good stand of clover is once obtained improvement will be much more rapid. Gradually a three-year rotation of rye, clover, and corn or potatoes may be built up. To this may be added oats following the corn, wheat (in the place of rye) following the

^a See Bailey, L. H., *The State and the Farmer*, pp. 51-54.

oats, and potatoes where desirable, making a four-year rotation. Stock may be added as the feed for their support is produced, or an orchard may be started.

LIVE-STOCK FARMING.

No one who has observed eastern conditions closely can have failed to note the large acreage in grass. Many of the pasture and hay grasses are very much at home in southern New York and make excellent growths. Large areas are well adapted to permanent grazing lands and to forage crops, affording an excellent basis for cropping systems for the maintenance of animals. But the animal industries, with the possible exceptions of dairying and poultry raising, are poorly developed. Attention should be given to the breeding and raising of sheep and horses, both of which will prove profitable industries in this section. In some cases beef cattle and swine may also be found profitable.

Despite the great development of these industries throughout the State as a whole, less stock than formerly is kept upon the hill lands of southern New York. As already pointed out, the raising of sheep for wool was once quite an industry in many parts of the State. Instead of abandoning sheep when the price of wool fell, a dual-purpose breed should have been introduced, as was done in many other parts of the country. Now that sheep have become more profitable New York farmers should take up the industry again. Large areas are better adapted to sheep pasturage than to anything else, and the opportunities for the development of this industry are great.

Another line which was formerly very profitable but which has been almost abandoned is the breeding of draft horses. The present high price of horses and the nearness to market of many cheap eastern lands open up a great field for profitable horse breeding. A few enterprising business men have already demonstrated this beyond a doubt.

It is an open question whether, under existing conditions, cattle for beef and hogs for pork can not be as cheaply produced in the East as in the West. In the first place, New York lands are not nearly so high priced as western lands, so that the investment on which interest must be earned is much less. Furthermore, the physical condition and fertility of the soil would be improved, thus raising the value of the land.

The whole dairy industry needs to be developed and extended on these cheap lands. The market for clean and wholesome dairy products is constantly growing, transportation facilities are improving, and the tendency in the price of milk is upward. Good up-to-

date dairies show excellent incomes. The greatest drawback the dairyman has is the feed bill, which absorbs so much of his income. The Bureau of Plant Industry has very emphatically called attention to this condition, and in a recent *Farmers' Bulletin*^a has shown how a large number of New England dairymen have succeeded in growing their own feed and so saved the feed bill.

In order to be successful in any of these lines there must be developed a cropping system designed not only to produce all the roughage necessary, but a large part of the grain ration as well, for the profits in the future will be largely measured by the ability of the farm to produce the feed required for the maintenance of the stock kept upon it. It has been demonstrated again and again by practical, successful farmers that it is perfectly possible to grow on New York farms not only the roughage but a large part of the grain ration required for a reasonable number of stock.

The whole matter then reduces itself to the need of a better system of management. The stock farm must be so planned that it will be self-sustaining. The problem is not a difficult one because we have a good deal of successful experience to draw upon. A short rotation with clover as a basis and with grain and forage crops, according to their adaptation, can be devised from successful experience. Instead of selling off stock when the crops get short and abandoning the farms when they grow less productive, conditions must be studied and difficulties remedied.

THE GROWING OF FRUIT.

There is good evidence for the belief that a strong line of development for the so-called abandoned farm land of the East is the growing of fruit, especially apples. The fact that the earliest settlers in central, southern, and western New York found the apple successfully grown by the Indian shows its natural adaptation. (See fig. 4.) The culture of the apple has become general in only a few sections, where the conditions are supposedly more favorable. The evidence at hand is that the higher class of fruit produced in these sections is largely due to the better cultural methods employed and not, as commonly thought, to better natural adaptation.

There are many examples of the successful growing of apples and pears in the area under consideration. Some of these orchards are as good and as productive as those in the highly developed fruit sections. In many cases old Indian apple trees and trees planted fifty or more years ago are still to be seen bearing fine fruit. The soil conditions are very similar and in some cases better than those

^a *Farmers' Bulletin* 337, U. S. Dept. of Agriculture, entitled "Cropping Systems for New England Dairy Farms," 1908.

in the fruit sections of the State. The climate is fully as favorable in the higher elevations.

What is true of other lines of farming is true also of fruit growing, namely, that it is possible to find even in the poorest locality a man who is successful in his business, and examples of success with fruit in these areas are not rare. The planting of fruit is successful on some of the hill lands of Pennsylvania and Ohio. In fact, wherever one finds good cultural methods and intelligent practice in fruit production he usually finds the industry profitable. (See fig. 5.)

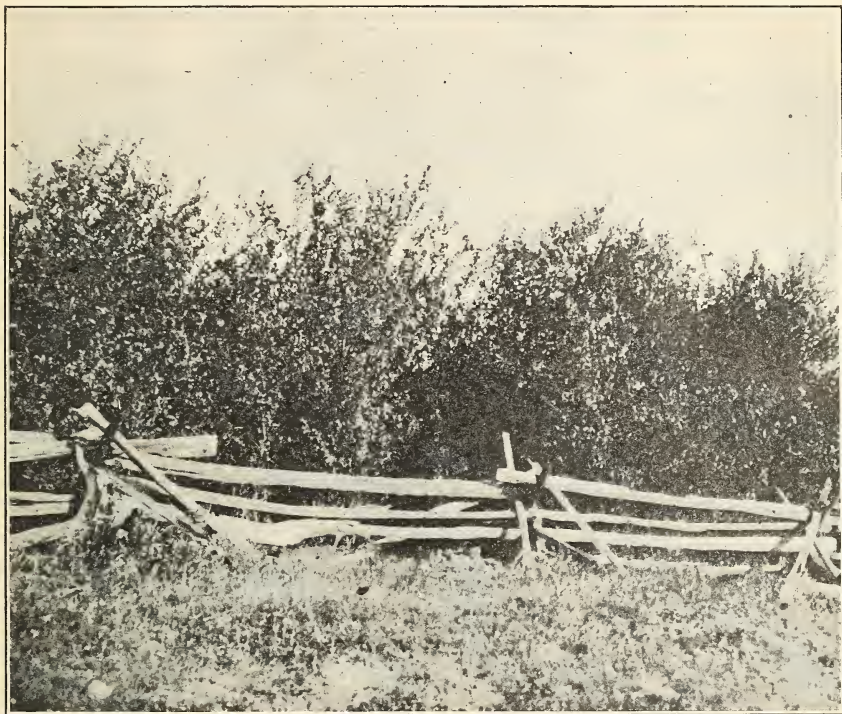


FIG. 4.—A wild apple thicket, showing the natural adaptation of this fruit to the soil.

It is true that fruit growing is more or less a specialty and that where one man succeeds several may fail. But when men learn the reasons for success and failure in the business and practice more intelligent methods success will be more common. The first thing that a beginner must learn is that trees are as much a crop as corn or potatoes and must receive just as much care. In fact, he must learn that trees require much more care than field crops, but in return they may yield five to ten times the profits. It is probable that the same cultural methods which are practiced on the lower and more level lands will not be applicable on the hill lands and that

it will be necessary to develop a new system of culture which will be especially adapted to conditions. The steeper hillsides are not susceptible to intensive cultivation. Spraying will be more difficult and the marketing of the crops will raise new questions. But these are matters which with study and application will be readily worked out as the business is developed.

But this line of development on the hill lands involves other problems than those of culture. It costs time and money to grow an orchard, and during this period the orchard is unproductive. Some strong side line must be carried on which will not only support the owner, who will probably be a man of small means, but meet the



FIG. 5.—View in a good 20-acre apple orchard on Volusia soil at 1,350 feet elevation.

extra expense of the orchard as well. This will undoubtedly be the growing of small fruits, potatoes, or some form of animal industry, according to their adaptation to soils, topography, availability of markets, and many other conditions. These are problems which the individual must work out for himself. Humus, either in the form of manure or clover, or both, will be a necessary factor both for the orchard and for the remainder of the farm.

The near future should see the old slipshod methods of many sections disappear and the despised old orchards rejuvenated and new ones planted. Great problems are worked out more rapidly and more successfully under the pressure of necessity, and the necessity of new

and better adaptations to the conditions of our hill lands needs no emphasis. Methods must be simple and more economical, but the opportunities are great.

DEVELOPMENT OF THE FARM WOOD LOT.

The traveler in New York State can not fail to be impressed with the abundance and character of the tree growth, indicating a great natural adaptation of the land to this class of vegetation. Again, he can not but see the utter impracticability of the cultivation of many of the rough and steep hillsides of the State. Economical crop



FIG. 6.—A hillside too steep to till, showing natural reforestation. This land ought never to have been cleared.

production is impossible on many of the hills because of their inaccessibility and their distance from market and from the source of supplies. Many lands are so located that the cost of hauling supplies and marketing ordinary farm products would largely influence profits. It is clear that large tracts of New York lands should be covered with tree growth. (See fig. 6.)

The national and some of the state governments have already adopted the policy of conserving the forest lands. They favor also the development of the farm wood lots, the small areas owned by individual farmers, which are the important factor from our point of view. These are not as a rule yielding much income at present, but

are an important part of the farm. Like other parts of the farm unit they should be made to yield an income.

Tree growth would prevent erosion on many of the lighter soils. It would protect the watersheds, prevent floods, and make the water supply more equable throughout the year. Moreover, the growth of trees as a crop can be made to produce a profitable income on many lands at a good valuation. From twenty to thirty-five years will suffice to grow a crop of trees which will pay a good interest on the investment in the land for the whole period. Throughout this area the hard woods, such as oak, chestnut, hickory, and ash, are found to thrive, and added to these is the more rapid growing but valuable white pine. The lands already timbered should be conserved, and additional lands should not only be allowed to reforest themselves, but should be helped along by the planting of such trees as are adaptive and desirable. Conservation of existing woodlands may be easily effected by such means as protection against fires, proper thinning out of worthless trees and undergrowth, care against injury by overpasturage, etc.^a

A METHOD OF WORK.

The usual agricultural agencies, whether state or national, have been unable to reach the southern section of New York as effectively as some other parts of the State. Personal visitation by practical men thoroughly acquainted with the situation seems to be one of the methods of meeting the problem.

During the past two summers Mr. George Monroe, of the Office of Farm Management, has attempted a detailed study of two areas in Tompkins County, with the object not only of finding out conditions and reasons for the decline of agriculture there but also of searching for and applying remedial measures. The results of a single year's work in these areas have indicated many important lines of improvement.

In a region where it was thought that corn would not grow well a few good crops have been grown during the past year as the result of seed selection and better cultivation. Where little or no winter grain was sown several fields have been seeded to winter wheat. Where the yields of potatoes have not been more than from 40 to 60 bushels per acre, from 200 to 250 bushels were grown during the seasons of 1908 and 1909. The ultimate aim, of course, is to get clover in rotation as nearly self-sustaining as possible, which will mean not only better money crops, but eventually the keeping of live stock.

^a Full information along this line may be obtained by writing to the State Forest, Fish, and Game Commission, Albany, N. Y., and to the Forest Service, U. S. Dept. of Agriculture, Washington, D. C.

These evidences of what can be done with the so-called "abandoned land" have had their effect—and a very noticeable one to a stranger going into the section—both on the land and on its farmers. Land that was for sale at almost any price two years ago is now (1910) not only held at considerably higher prices but much less inclination to sell is manifested.

At the same time that this local work was being done a general survey of the whole area involved was made, to determine just what parts of the State were in the same condition and what the facts in the case really are. In the second place, a careful study of conditions and the causes of these conditions has been made, in order to work out the best future system or systems of management for these farms. A clear idea of the real condition of affairs and the extent of this condition has been obtained and the causes which have led up to it determined.

Many observations of successful and unsuccessful farming in these areas indicate the best method of procedure in building up the most successful systems of management, namely, those which will produce the largest income and leave the land in the best condition for future production.

The United States Department of Agriculture is not the only agency which has been working on this problem. The New York State College of Agriculture, through field experiments and correspondence, and the State Department of Agriculture, through its farmers' institutes and its bulletins, have also given the problem considerable attention.

It is now proposed to take up in more localities detailed work of the character which Mr. Monroe has done. This type of personal work seems to be the best solution of the immediate problem, and not only the best but the easiest way of correcting fundamental errors in the prevailing practices of this section. This work is to be done in connection with the State College of Agriculture and the State Department of Agriculture. A cooperative agreement has been formed whereby the funds for the work are to be supplied jointly by the State and by the National Government. The energies of these three agencies will be directed by a supervising agent, with headquarters at Ithaca. All efforts to introduce better methods of farming in the State will be made under the immediate supervision of this joint representative and as a part of a general and systematic plan of work. It is expected that this plan will enable all three institutions to do more work along this line and to do it more effectively.

The opportunity to establish a practical and successful system of management on lands which can be purchased at remarkably low prices is great. Many farms can be purchased for less money than the

buildings are worth. A small amount of capital will go a long way. These lands are not infertile and respond very quickly to good management. They are bound to increase in value because of their present too low valuation, because of their nearness to great markets whose demand is constantly increasing, and because of the occupation of practically all of the available agricultural areas. Excellent opportunities are presented in connection with these cheap hill lands in New York. But the men who undertake the solution of this problem must be men of practical experience who have a thorough and intimate understanding of it. Not every man who attempts farming in this region will be successful. Moreover, those who would be successful on these lands must be prepared to make the best of many difficulties and to put up with many inconveniences. Among these are the long distance from railroad facilities, accompanied usually with long and steep grades over which to haul products and supplies, more or less isolation and inaccessibility, the scattered neighborhood of a sparsely settled region with its consequent lack of good schools and churches, a rigorous winter climate with deep snows, and the necessity for hard, persistent work, with the possible reward of failure. Only those who are prepared to face and overcome these difficulties should attempt farming here. But to those who do succeed the reward will be great.^a

CONCLUSIONS.

(1) The run-down condition of the land in southern New York is due primarily to the misuse of the soil, not to its natural infertility.

(2) Successful experience in growing crops on this land indicates that the following means are to be depended upon to build it up:

(a) Thorough tillage and liming of the land are the first steps in securing a clover crop, which forms the basis of practically all the successful systems of farming employed in this region.

(b) The addition of humus to the soil is the next important step. Buckwheat and winter rye are the two most promising crops with which to add the first supply of humus. One crop of each can be grown and plowed under inside of twelve months, or a single crop of either previous to planting some desired crop.

(c) When a stand of clover is once obtained a short rotation should be adopted, including clover, some grain crop for feeding work stock, and a cash crop, usually potatoes, to provide money for improvements.

^a See Bailey, L. H., The Agricultural Situation in New York State, in Bulletin 12, N. Y. State Dept. of Agriculture, and Tarr, R. S., Decline of Farming in Southern Central New York, in Bulletin of the American Geographical Society, vol. 41, no. 5, 1909, pp. 270-278.

(d) A potato crop is often the first necessity, in order to provide ready money for other farm operations. In that case a small field which has lain idle for two or three years and so accumulated some humus should be planted with good new seed and thoroughly tilled.

(3) After the soil has been improved any one of several systems of farming, such as dairying, sheep raising, fruit growing, etc., whichever is suited to the given locality, can be built up on this foundation.

Approved:

JAMES WILSON,
Secretary of Agriculture.

WASHINGTON, D. C., *May 2, 1910.*

[Cir. 64]

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