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**Home Course In  
Modern Agriculture**

**III.—Preparing the Ground**

By **C. V. GREGORY,**  
Agricultural Division, Iowa State College  
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**S**INCE the condition of the soil has so much to do with the readiness with which the plants can get food from it one of the most important problems that confront the farmer is the proper preparation of the ground. The first work of preparation usually consists of plowing. Plowing the ground pulverizes it to some extent and buries the weeds and trash that may be on the surface.

Plowing should not be done when the soil is too wet, or the first of these objects will not be accomplished. Instead of being pulverized, the slice turned up by the plow will be packed together more firmly than ever and

will bake into a hard clod. The furrow slice will also turn up cloddy if the soil is too dry.

A good way to tell when a field is in proper condition to be plowed is to squeeze a ball of the dirt in your hand. If it sticks together in a pasty mass you had better let it dry a few days longer. If it hangs loosely together in a mealy ball the plow can be set to work at once. Such soil will fall over the edge of the moldboard in loose, crumbly masses. The field will not be ridged like a washboard, as too many fields are, but will aptly demonstrate the truth of the old saying that "a field well plowed is half harrowed."

In order to do a neat job of plowing a colter and a weed hook are necessary

attachments. By using them all the trash can be turned under completely. This not only hastens the decay of such matter, but also adds greatly to the looks of the field. Too many farmers do not pay enough attention to looks. A ragged looking field may raise just as large a crop as a smooth one, it is true, but the farmer who is careless in his plowing is likely to be careless in everything else.

If the plowing is done in the fall it does not matter so much whether it turns up cloddy or not. The hard frozes of winter are the best pulverizers that ever tore a clod to pieces. This is one of the advantages of fall plowing. One of the disadvantages is that in an open winter the soil is liable to wash badly. This can be prevented to some extent, however, by planting a catch crop, such as oats or millet, on the field after plowing.

The depth of plowing will vary with the conditions. A light, sandy soil does not need to be plowed as deeply as a heavier one. If the ground is plowed the same depth every year the bottom of the furrow will become hard and the roots will have difficulty in getting through it readily. A good plan is to begin at, say four inches, and plow one-half inch deeper each year until a depth of seven or eight inches is reached. Then go back to four inches and begin over again. In this way a little new soil is turned up every season and the layer of surface soil gradually deepened.

Spring plowing should be shallower than that done in the fall. The soil is full of tiny pores, its structure being much the same as that of light bread. If you will put one corner of a slice of bread in a dish of water you will notice that it becomes wet for a considerable distance above the surface of the water. This is caused by the moisture flowing upward through the little holes in the bread. The force that causes water to rise in a small tube is called capillarity. It is this capillarity that makes the water rise from the subsoil up to the surface where the roots can use it. The smaller the capillary tubes the faster and higher the water will rise.

When the ground is plowed these capillary tubes are broken up, and the rise of water is checked. To start it again the soil must be allowed to settle for a long time or else be worked down with the disk, harrow or roller. In the fall the depth of plowing does not matter, since the furrow slice will have all winter in which to settle. But in the spring this capillarity must be restored almost at once or the surface layer will become so dry that germination and later growth will be checked. Hence the importance of shallow plowing, so as to reduce the labor of disk-ing and harrowing. If the surface of the ground is crusted or if there is much trash to be turned under the field should be disked before it is plowed. This will provide for a layer of fine dirt in the bottom of the furrow, which will pack down closely and help to restore capillarity.

If the furrow turns up "shiny" or shows any tendency to bake into clods, it should be harrowed every half day, or every day at least. This seems like a great deal of extra work, but if a harrow is kept in the field it does not take long to hitch on to it and go over the newly plowed strip just before quitting for noon or night. A few minutes spent in harrowing at such

times will pulverize the ground more than hours of work after it has become dry and baked.

The fall plowing will usually need to be gone over with the disk to get it in shape for planting. The superior condition obtained by double disk-ing—that is, letting the disk "lap half"—will more than pay for the extra labor. There is an additional advantage in that the surface is left smooth. Disk-ing spring plowing is seldom necessary.

In cases where improper plowing has left a field cloddy the roller may often be used to advantage. A corrugated roller is better for this purpose than a smooth one, as it tends to crush the clods rather than to simply push them down into the finer dirt. A homemade "planker" or clod crusher will often answer the purpose as well as a roller.

The roller packs the ground considerably and so quickens the capillary rise of water. If the surface is left smooth much of the moisture that comes up will be lost by evaporation, and later in the season the crop will be likely to suffer from drought. To avoid this the roller should be followed immediately by the harrow.

This loosens a thin layer of surface soil. When the capillary water reaches this loose layer its rise is checked, and comparatively little is lost by evaporation. For this same reason it is often well to harrow fall plowing as soon as it is dry enough in the spring, especially if disk-ing is not to be done until late.

After the ground is plowed and disked the harrow must be used to complete the preparation for planting. There are many kinds of harrows, but none that are better than the ordinary spike tooth. These are made in all styles and sizes. The harrow is economical to use, since it gets over ground so rapidly. The best time to harrow in order to pulverize the soil is immediately after a light shower. The little clods will then be softened and will be easily knocked to pieces. To kill weeds, however, it is better to wait until the soil is a little drier, as harrowing a wet field will transplant the weeds rather than destroy them.

Do not be afraid to harrow too much. No work that you can put on a field pays better. No other implement will kill so many weeds in so short a time, and no other machine will tear clods to pieces so rapidly. A field well plowed and disked and harrowed until it is in as fine a tilth as it is possible to make it is an ideal seed bed. Seed planted in such a soil will start under the most favorable conditions. If the seed itself is strong and the after treatment what it should be, a maximum crop may be expected.

Not all fields need to be plowed before the crop is put in. It is a general practice in the corn belt to sow small grain on stalk fields without any previous preparation. Experiments have shown that small grain does not yield enough more on plowed corn stalk ground to pay the cost of plowing. Very frequently they do not yield as much. Where small grain follows small grain, however, plowing is necessary to kill weeds and loosen the surface soil. It does not need to be loosened as deeply as for corn, however, since the small grain plants are harder than corn and the roots are more aggressive in pushing through a hard soil.

While plowing stalk ground is unnecessary, it will usually be found profitable to disk the land before seeding. This chops up the cornstalks and provides a mellow layer of soil for the seed to germinate in.

Where the oats are to be put in with a drill the ground should be double disked previously. If sown broadcast



FIG. VI.—PREPARING THE GROUND WITH A DISK PLOW.

one disk-ing before sowing and one afterward will cover them better than two after sowing. The drill is becoming more popular for sowing oats, and justly so. It places the seed at an even depth and covers them all. It saves seed because it places all of it where it has an opportunity to grow. After the oats are drilled or disked in at least two harrowings should be given. Even three or four would not be too many, since this is the last chance to cultivate the crop.

In some parts of the corn belt the practice of listing corn is followed. This consists in throwing up a large furrow and planting the corn in the bottom of it. In this case there can be little previous preparation of the ground unless it is to go over it once with the disk. Corn is listed only on very light soils, which do not puddle or become cloddy easily. Such soils need less preparation than the heavier clays and loams.

**Christian Science, the  
Religion of the Bible**

(Continued from page 6.)

quences, we do not wish to be understood as saying that all who get sick are sick as the result of any conscious or willful wrong-doing on their part, for some of the best people in the world seem to suffer most, some of the most refined and sensitive natures seem to succumb most rapidly to the ravages of disease; but what we do wish to be understood as saying is, that we are all suffering in greater or less degree as the result of long ages of wrong human conditions or human error; long ages of living too far away from God and his divine law; long ages of too great failure to study and understand and apply the teachings of the Bible, and especially the teachings of the great Founder of the Christian religion. Hence the necessity of mankind 'awakening to a higher and truer sense of the causes and cure of sickness and disease. Hence the need of the establishment of that church whose purpose and mission are to "reinstaurate primitive Christianity and its lost element of healing." This is the purpose of the Christian Science church. This is the single life-purpose of the Discoverer and Founder and Leader of Christian Science. To this great end she wrote and published and promulgated the Christian Science text-book, "Science and Health with Key to the Scriptures." To this great end she organized the First Church of Christ, Scientist, in Boston, Massachusetts, and all of its branches. To this great end she caused to be established a Christian Science literature, which is so rapidly reaching out and leavening human thought. To this great end she caused to be ordained as the only Pastor of the Christian Science church the Bible and its Key, the Christian Science text-book. To this great end the Lesson-sermons, selected from the Bible and the Christian Science text-book, are read each Sabbath all over this land and in other lands. To this great end every legitimate means of spreading this great Truth is resorted to, that the public may be informed thereof, and avail themselves of its blessings and benefits if they desire.

In thus endeavoring to obey the teachings of Christ Jesus in all their fullness and to establish upon earth his complete gospel, are Mrs. Eddy and her adherents doing rightly or wrongly? Are they or are they not entitled to the good will and the good fellowship of all who desire a full reign of Christ's gospel in the earth,—a complete redemption of humanity from all its sins, its sorrows, its griefs, its woes, its sicknesses and its deaths?

May we not fairly ask our friends of all Christian churches: If it is right to do or to undertake to do a part of the works which Jesus said must be done by those who believe on him, is it not right in a greater measure to do, or to undertake to do all of such works? If, on the other hand, it is wrong to do or to undertake to do all of those works, it is wrong in relative degree, to do or undertake to do a part of those works. How, then, can anyone claiming to be a follower of the Christ consistently disavow or denounce the teachings of Christian Science and the glorious results thereof?

Christian Scientists do not claim to be able at this period to do all the works that Jesus and some of his disciples did, but they do sincerely claim to be making an honest and united effort in that direction.

And even thus far their labors have been crowned with such wondrous and gratifying success that they may well be encouraged to go on and on in the Christ way, with the full hope and expectation and knowledge that if they are true to their sacred trust, sooner or later there shall be accomplished here upon this earth, all of the great works that Jesus did and taught his disciples to do, and which he commanded them to hand down to all the nations of the world, as we have clearly shown: Not only so, but the greater works of which he prophesied shall also be accomplished.

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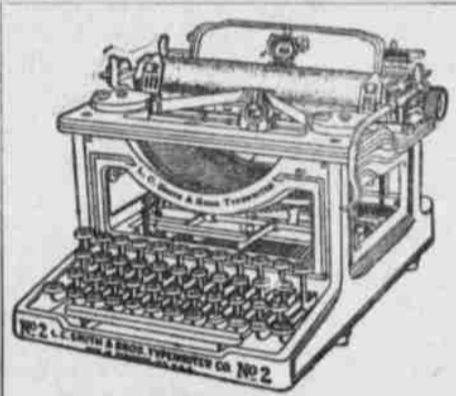
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