cial, and the chief benefit of the practice arises from the fact that a well stirred soil has a much greater capacity in dry weather to absorb and retain moisture than one in an opposite condition. It is a sound practical maxim, universally sustained by experience, not to touch land when wet, but stir it about freely when dry.

With regard to the density of soils, a quality on which their capacity for heat and moisture greatly depends, some popular fallacies obtain. Clays are considered proverbially heavy, and sands light. This, however, can only be true as regards the animal strength necessary to cultivation. A cubic foot of sand weighs nearly twice as much as a cubic foot of water; but the stiffest pipe-clay, absolutely incultivable, only weighs about one-and-a-half that of water Again, it is well known that strong clays in a wet state contract amazingly when heated, and that sandy soils are but slightly affected in that respect. Some of our strong agricultural clays will contract under the influence of a summer sun as much as one-tenth part of their bulk, while the sandy soils undergo scarcely any change whatever. Again, dry clay will retain from 30 to 50 per cent. of water, and hold it most pertinaciously; whereas pure sand can only retain four or five per cent., and will readily part with that by exposure to the warm currents of the atmosphere. Dried peat will absorb more than one-half of its own weight of water; and such a soil is agriculturally worthless until it is thoroughly drained, clayed and limed; or, in other words, supplied with a very heavy dressing, or series of dressings, of a rich calcareous marl.

From the foregoing remarks it will be apparent that for the farmer to bring his land into the best state for the profitable production of crops, he must pay strict regard to the mechanical and chemical properties of his soil, and seek to improve them by draining—where necessary—thorough cultivation and judicious manuring; varied, of course, to meet existing exigencies of climate, markets, and the physical conditions of his farm.

Depth of Ploughing.

The great object of ploughing is the pulverization and preparation of the soil for the purpose of receiving the crop that is to be cultivated. And as to the manner that this should be done, there is great diversity of opinion, some insisting that it should not be to a depth of more than four or five inches, and others as stoutly insisting that it should be ten or twelve inches; and like the parties who disputed as to the colour of the chameleon, they both are right and both are wrong.

There are important considerations that enter into both the investigation and practice of this subject, and which in a greater or less degree influence the results. In the first place, very much depends upon the availability of the soil for plant food. If it is in that peculiar condition in which it can not be immediately used by the plant, in consequence of some element that is deleterious to plant growth, then the thought of ploughing to a great depth, in the hope of favourable results, is obviously erroneous, and the practice will be labour lost, so far as immediate results are concerned.

There are very many soils that, in consequence of repeated and continuous shallow culture, have attained to such a state that deeper culture must be very gradual. This applies with peculiar force to many of our fields that are composed of a very firm and compact sub-soil, but which, when once reduced, furnish a soil not wanting in fertility. Now, it is very plain to be seen that this transformation must be gradual; an inch or so at a time must be exposed to the action of the atmosphere, the winds and rain, and the frosts of winter, whereby thorough disintegration is effected; and although several years will be necessary in order to effect a reduction to a considerable depth, it will be found that the labour will not have been in vain, since it requires no great amount of argument to prove the benefits; for it is admitted that a good proportion of the inorganic elements that enter into the composition of plants are obtained from the available soil; it is very clear that if the quantity of available material is increased, then as a consequence the crops must either be increased or else the period of fertility of the soil greatly lengthened, in either of which cases there must be a material benefit.

Not only that, but if the soil be of that peculiar character and composition capable of receiving and absorbing the organic elements of plants, that may be furnished either by natural or artificial means, then if the extent of this capacity be increased, there will be also a much larger accumulation of all of the elements necessary to a healthy and vigorous plant; therefore it is that this practice is sometimes likened to doubling the number of cultivable acres. At all events, so far as efforts have been put forth in this direction, they have never remained unrewarded. Of course it is always to be understood that the soil should not contain an excess of humidity, for in that case the ill effects of any excess of moisture would balance the benefits of deep culture.

It would seem, then, that the answer to the question of the expediency of deep or shallow ploughing hangs upon certain conditions, and if these are properly fulfilled, the results are favourable to deep ploughing.

Now, what are some of the results that follow this course, where all the conditions are favourable? In the first place, it cannot be denied that a good portion of the food of plants is taken up by the roots, and if there is a limit to the extent to which these can be put forth, then to that degree there is a limit to the inorganic sustenance of the plants; so, therefore, if the soil is deeply pulverized, the extent to which the roots can spread is greatly increased, and hence, as a consequence, the plant can assimilate a much greater quantity of food, and therefore store away an increased quantity of grain for the husbandman.

Again, as all properly constituted soils possess such hygrometric qualities as enable them to absorb and hold for future use a proper amount of moisture, if the extent is increased, as stated above, and there is also a permeability for the passage of the roots of the plants, then it follows that such soil is vastly better prepared to withstand the blasting effects of droughts, and this fact has been amply demonstrated in practice. Nor is this all. Some years since, Hon. J. S. Gould, of Hudson, N.Y., under the auspices of the Agricultural Society of that State, made a tour of the Western States for the purpose of obtaining agricultural information. This occurred in the fall, after the first frosts; and as he passed through the States he noticed whole fields of corn that had been cut down by the frost. There were many of these, which was considered nothing remarkable; but what attracted the attention particularly was, that occasionally a whole field would be found, in which, although the corn of fields surrounding was entirely killed, in this it would be perfectly green, bearing no appearance of having felt a frost in the least. This peculiar condition of things, which was not confined to a solitary field, was made the subject of enquiry, and, singularly enough, in every case the result of the investigation was contained in the answer, that the field was ploughed with a Michigan subsoil plough. What peculiar thermometric change was thus effected, whereby the injurious effects of cold were neutralized, remains a subject of enquiry, but if such an effect is produced, and thus in a measure the growing season lengthened out, it is a matter of no inconsiderable importance to the farmer, especially if he dwell in a high latitude, where the summer is but short. There can be little doubt that, other things being equal, the proper mode of ploughing is to do it deeply, pulverizing the soil to the greatest degree, since successful cultivation depends to a considerable degree upon the disintegration of the soil; and even though the result upon only one acre would be considered to be perhaps a moderate increase, yet, taking into account the acres upon acres under cultivation, when reckoned as an aggregate, how vast must be the result, and what an addition to the material prosperity of the whole country.

WILLIAM H. YEOMANS.

Columbia, Conn., Jan. 29, 1872.

Talk with Farmers.

LIGHT AND HEAVY LAND.

"How did the Deihl wheat do in Haldimand last year?"

"It gave us a capital crop. I got over forty bushels an acre of the finest sample I ever saw. I sowed two kinds of fall wheat last year—the Deihl and the California; both did well, but the Deihl was far the best, in quality as well as quantity."

"Are you still satisfied with that light land in dry weather?"

"Yes, I think I like it better every year, as I understand more how to treat it. I like it better than clay. If we are only smart enough in the spring and get the crops in