

tion we had an opportunity of seeing, and always with advantage, as there is scarcely any work on the subject, that does not contain some useful information or suggestions that the most experienced farmer might profit by. There are numerous publications for information and instruction in every other business and profession, and we see no sound objection to farmers endeavouring to obtain instruction and information from agricultural publications, founded on experiments and practical experience:—

“It should now be asked, what depth should be given to the ploughing, the variety of opinions which exist with regard to the point has entangled us in a labyrinth of discussion, through which we vainly endeavour to thread our way. There is a very great difference in ploughing a soil deeply, the vegetable layer of which is only homogeneous to a considerable depth, and augmenting a more or less superficial layer of earth by means of deeper ploughings, or, in other words, rendering its constituent parts homogeneous to a greater thickness, and impregnating them with fertilizing particles throughout their whole extent. Every attentive observer must admit the manifest superiority of deep over shallow soils. The depth to which the roots of plants will penetrate when they meet with a fertile soil, varies according to the nature of these plants. There are some, the roots of which have been traced to the depth of fifteen, twenty, and even thirty feet: as for example, sainfoin and lucerne. Red clover will push its roots to the depth of nearly three feet; and several other plants of common growth, probably penetrate even to a greater depth, when, instead of encountering obstacles, they meet with a loose, fertile soil. I have pulled carrots two and a half feet in length, the top root of which was probably another foot long. But as land is chiefly devoted to the cultivation of various kinds of grain, its value ceases to increase beyond the depth attained by the roots of cereals; at least to a similar extent.

The unassisted eye will frequently enable us to trace the roots of grain plants to the depth of eight inches, and with the aid of a magnifying glass, we can distinctly see that these roots have been broken off, and some portion of them still left in the ground. I have myself seen corn grow on the shoulders of ridges, with roots twelve inches long, but I believe they would never have penetrated so far on a flat soil even had it been equally rich. The seed, when sown, is usually placed two inches below the surface of the soil; and I have seen the roots penetrate twelve inches deep into the soil. Hence it appears we may consider twelve inches to be the proper average depth for a soil adapted to corn, and admit it as a principle, that the plants penetrate thus far where they find the earth suf-

ficiently loose and friable. Where the plants are sown very closely to each other, their roots are still more disposed to penetrate into the ground. Whenever we have the opportunity of observing, we shall see the roots avoiding each other and put forth their largest shoots in those places where they will not interfere with others; this is most perceptible in plants growing in water, because we have more opportunity of observing the roots there. When therefore, a plant is prevented by those around it from extending its roots in a lateral direction, it pushes them downwards, provided that instead of encountering obstacles it meets with a loose soil well impregnated with nutritive matter. But if, on the contrary, the roots encounter a hard or sterile substance, it extends itself on all sides and in this case, when the plants are very close together, their roots form a thick and knotty tissue disputing with each other for room and nutriment; the weakest give way before those which possess more vigour, and, however advanced in their vegetation, are weakened, or literally perish. The deeper a soil is, the nearer together can plants be made to grow in it without injuring each other, and the greater number of them will attain to perfection. No attentive observer can fail remarking the wide difference between deep and shallow soils. It appears in proportionate degrees in soils of four, six, eight, and twelve inches in depth; provided that such soils are equally impregnated with manure, throughout their whole extent. If it were possible to conceive that each grain of corn bears a plant, we ought to be able to sow land having a layer of vegetable soil eight inches in thickness twice as closely as we could one which had only four inches depth, and obtain a double crop from it. In this manner the value of a soil would be determined by a multiplication of its surface by its depth. But we must not, however, venture to carry out this principle to its fullest extent, because the influence of the atmosphere always gives to extent of surface an advantage over depth. No impartial observer who has had experience in this matter will, however, venture to dispute the fact that depth of land has a great influence over its value. In order not to exceed the bounds of truth, I shall lay it down as a principle that this value is increased eight per cent by every additional inch of depth which the soil acquires from six to ten inches, and diminished in equal proportion from six to three inches.

But deep soils have likewise another advantage; they suffer much less from drought and from moisture than those in which the layer of vegetable earth is more shallow. When the weather is wet, and a great deal of rain falls, the water sinks into a loose soil impregnated with manure as low as the vegetable layer extends. Such a soil absorbs a quantity of moisture proportionate to its depth, before it suffers any to return to the surface. This is the reason why garden ground, which is well-tilled with spade labour, never suffers from