

say, it is weeping weather. Umbrellas are always in order—and it is a great perplexity to know when to carry them up, or when down. it would suit me better, if the weather was more positive, more rainy when it rains, and more fair when it is fair, which is the American style. But it has just occurred to me, that the weather was not made especially on my account.

Bristol, England, April 19.

Z. E.

On the Aeration of soil.

By M. JÆGER.

M. Daniel Hooibrenk, gardener at Heitzing, near Vienna, announced, in 1859, a new system of culture, stated to ensure a more vigorous growth than can be induced by any other means. This consists in placing in the earth pipes or air channels pierced with holes, which permit the air to penetrate throughout the mass of soil traversed by the roots. According to the inventor of this system, its advantages are numerous and important: he points out the following:

1. The strongest clay soils, under the influence of currents of air transmitted through the pipes, are divided by thousands of small fissures and has rendered friable, so that roots can easily penetrate them. The depth at which the pipes should be laid depends on the nature and consistency of the soil.
2. After the soil has been aerated by means of the air-pipes, the vegetation of plants growing on it becomes more active, especially in the cases of grain crops and vegetables. The roots finding the soil in a finely divided state penetrate deeper than usual, and are consequently safe from the vicissitudes of temperature which take place near the surface.
3. The looseness produced by the circulation of air in the soil causes a rapid absorption of rain water, and prevents caking of the surface. On the other hand, during long-continued drought, the roots, owing to the great depth to which they have penetrated, are not exposed to the trying effects of the external air, and are enabled to obtain a supply of moisture which they could not do near the surface.
4. The air pipes passing through sour soil causes the sourness to disappear, so that where there had herbage previously grew, the finer grasses can be produced. These good effects are more particularly observed in swampy or marshy ground, which may thus be changed into fertile soil.
5. The soil, being always kept porous by the circulation of the air, can be more easily worked; and from its openness preventing the accumulation of water, cultivation can be commenced earlier in spring.
6. Plants grown on soil thus improved produce a great mass of roots, and consequently,

being very strong, they require more space. There is no need to sow so thickly as usual; and hence a considerable saving of seed is effected.

7. Manures are much more energetic in their action in soil that is aerated in this way than in that which has not been so treated; the reason of this being, according to M. Hooibrenk, that the aerated soil is more uniformly moist throughout its thickness, and that being the case the decomposition of the fertilising substance is more rapid and uniform.

In short, the inventor of this system states that double and even triple the produce may be obtained from land so treated. This increase soon repays the expense of laying the air pipes. He also states that in the culture of the vine the ripening of the fruit is greatly accelerated, and the quality improved. Such assertions could not fail to be received with doubt by many. Careful experiments were therefore made to test their truth by Messrs. Fitchner & Son.

The field in which these experiments were conducted consists of a bed of loam or sandy clay (*argilosableuse*) from 13 to 16 inches deep, resting on a subsoil of rounded pebble-stones like those in an adjoining brook. On the other side of the field is another brook, about 6½ feet lower. This difference of level, taken in connection with the stony subsoil, made it doubtful at first whether the beneficial action of the air pipes would not be owing to their acting as drains in carrying off surplus water. The field contained rather more than 1½ acre, and had been in cultivation since 1852, but yielded only indifferent returns, at most about six to one of seed. Messrs. Fitchner placed four air pipes at the depth of 3 feet across the field. Their internal diameter was nearly 2½ inches. The field thus prepared was divided into a number of beds, at right angles to the direction of the air pipes, and extending to the portion of ground not furnished with the apparatus. Of the four pipes first laid down, two were joined by a communication pipe, and the mouth of one of them opened into the ash pit of a furnace, whilst the other extremity terminated in an air tank, the sides of which were of masonry.

The surface of ground furnished with air drainage was half an acre and 22 poles. The furnace at the end of the pipe was intended to show that the atmospheric air could reach the fire by passing through the soil. To prove this the opening at the further extremity of the pipe was completely closed, and also the furnace and ash-pit doors, in such a way that no air could reach the fire to support combustion except by passing through the soil under which the pipe leading to the furnace was buried. The fire, however, burned perfectly well throughout the day. To burn ten pounds of wood in 2½ hours would require 8,000 cubic feet of air, and this would have to traverse 108,000 lbs. of soil be-