

too porous, and some clay soils too retentive, and when such is the case the lacking constituents can be supplied at a comparatively small expense. When the above requirements are taken into consideration it will be seen, that considerable judgment will be called for, and that perfect success may not crown the first attempt. Dr. Pinkham, of Montclair, N. J., who, with others of that town has given the system a thorough test, says: "When organic matter is absorbed into the soil near the surface, as provided for by this system of sub-surface irrigation, coming in contact as it does, in a state of minute subdivision, with the air and condensed oxygen contained in the porous soil, it undergoes a rapid oxidation. The change which takes place is in every essential particular equivalent to that of combustion. The organic matter thus treated is just as much destroyed as if it was burnt, and the resulting products are as harmless as the products of combustion of wood or coal. Soil, which has been used in this way for many years has been found to be but little changed, the liquid resultants of disintegration having evaporated or become absorbed by the roots of plants, while the solid resultants which remain but slightly (and not in any essential particular,) differ from the original constituents of the soil."

Dr. Pinkham, again, quoting Schubler, says: "The earths possess the remarkable property of absorbing oxygen gas from the atmospheric air, a phenomenon pointed out many years ago by A. Von Humboldt. This property of the earths is confirmed almost without exception, provided they be employed for this purpose in a moist state. In the experiment which he instituted, exposing one thousand grains of different earths for thirty days, in vessels of 15 inches cubic contents, (15 inches of air containing 3.12 inches of oxygen) he found, that sandy loam absorbed 1.39 inches of oxygen, clay loam absorbed 1.65 inches, and garden mould 2.60 inches."

With regard to the quantity of land required for the system, Colonel Waring recommends an area of 250 square feet to each person. Allowing the household a consumption of 300 gallons per day, will give 3 gallons of sewage to 25 square feet of ground. If we assume a depth of only 4 feet for soakage, this will give us 100 cubic feet of earth to filter and absorb 3 gallons of water per day.

In the experience of those, who have used the system, it has, when properly constructed, been a complete success.

Col. Waring says: "Seven years ago last October, when I built my present house, I applied this method there in the most thorough way, and have been watching it, with great care, with a view to what I might learn from it from that time to this. I do not hesitate to pronounce it absolutely perfect. I am satisfied that it affords relief which is open to every one who has even a little bit of ground adjoining his house. I would say, by the bye, that I have no water-closets in the establishment; we use earth closets only; so that my experiment has not been complicated by that element. At the same time there is no practical difficulty; there is no reason why that may not be taken care of as well as the other. The water settles through the soil, thus finding an outlet, and the soil through which it passes filters out the foul matters. Immediately the water passes away, fresh air enters from the surface, and by the well-known concentrated oxidizing power of porous matters, whether powdered earth or whatever it may be, an entire decomposition is effected of this foreign matter, so much so that after five years, there being, from defective work, an occasion to take up a part of this system of drainage, I took up the whole, and gave it a thorough examination, and in no place could you detect in the earth, which lay adjacent to these tiles, in which they were immediately encompassed, either by appearance or odor, the slightest difference from ordinary fresh-smelling garden mould. This has been going on, as I say, since seven years ago last autumn, for a household of six persons, with rather a copious use of water, and there has been no other means adopted. I would not, of course, on my own single experiment, venture to recommend this, as I have done frequently, to the public as being worthy of adoption. Its use has extended very much. I applied it last year to the sewage of the whole village of Lennox, in Massachusetts; and in England it is being adopted for the sewage of country houses far and wide, and is based on the principle which is thought by many English engineers to promise the only relief that they can have from their sewage. When I am describing this, the question which is almost universally asked is. What becomes of the solid matter and grease in the settling basin? At first I used to have it taken