dry air, passed through the balsams and rezins with Petrolin ol. as a menstruum, probably stands superior to all.

In emphysema, compressed air and rarified air are deemed by many to be advantageous, particularly the latter; as it enables the largest amount of residual air to be expelled from the air-cells, thus favoring a return to the normal condition of the lung tissue.

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SUB-SURFACE IRRIGATION DRAINAGE.

BY EDMUND BURKE.

THE disposal of liquid or semi-liquid house wastes, in localities destitute of sewers, has been for many years a very serious problem, and more especially since civilized communities have become awakened to the necessity of sanitary reform.

In the "good old days" when the yard well was the nearest approach to a plumbing appliance, the housewife was content to throw the kitchen slops on the ground near the back door and sometimes very near the well, oblivious of the fact that the filth-laden water eventually found its way into the said well, greatly to the danger of the health of the household.

A step backward was the rough stone drain leading sometimes nowhere, each crevice holding decayed filth, the whole becoming an elongated cess-pool.

Then as plumbing appliances began to be introduced, and when no convenient water-course was at hand, the leaching cess-pool was introduced, built of uncemented brick or stone and poisoning the ground with its foul filterings, generating death dealing gases, often bottled up, with their only outlet through traplecs or defective fixtures.

The method of disposing of house wastes by the sub-surface irrigation system, was developed in England some 25 years since by Rev. Henry Moule, and was introduced into America by Col. Geo. E. Waring, of Newport, some years later.

The system consists in the intermittent flow and distribution of liquid sewage through open jointed porous tiles (known to us as weeping drains), into the soil at from 9 to 18 inches below the surface of the ground, and at intervals of about 6 feet. These pipes should be laid in rows, like a gridiron.

It is necessary that these pipes should have just sufficient fall, to prevent the liquids running too rapidly to the ends of the drains, and thus gorging them at these points, and causing periodical eruptions of filthy water to the surface. At the same time, the fall should be sufficient to carry the water into and along every branch, whence it will find its way evenly and rapidly into the ground; a fall of about one-half an inch to 10 feet has been found to best meet these requirements.

For the success of this system it is necessary to provide: 1st, a settling tank; 2nd, a flush tank; and 3rd, that the ground shall have the proper slope and be drained either naturally or artifically.

The settling tank is necessary for the first reception of the sewage, especially where fecal matters and deposits of grease have to be dealt with. This tank should be built of hard brick, built in cement, and plastered with the same material both inside and out. It should be extended to the surface, coped with stone, and have a durable hinged and padlocked iron lid. It has been found that the bulk of the more solid portions of the household wastes becomes reduced to liquid pulp in a few days and passes off without choking the drains.

The mouth of the outlet drain should dip several inches below the surface to prevent the entry of floating grease or solids. The tank should be of capacity sufficient for all possible demands—at the same time it should not be so large as to contain an undue amount of filth—better that it should be smaller and more frequently emptied.

An examination is required only at long intervals for the removal of possible accumulations of grease, the greatest enemy to the continuous working of any drainage system.

The flush tank is necessary to create the intermittent flow before mentioned. This tank should be of size sufficient to store and retain the accumulating wastes till the previous discharge has had time to become throughly absorbed by the ground. Its size should also approximate the combined capacity of the discharge pipes, so that the whole system will be filled at one discharge of the tank.

The ground should be carefully levelled off to a fall equal to that required for the drains, so that when laid they shall all be, as nearly as possible, at an equal distance from the surface.

If the soil is loamy or gravelly and a few feet higher than a water course or depression, it will not require under-drainage. If heavy clay, retaining surface waters, it will. Some sandy soils are