excess water and improvements in mechanical and industrial operations, the air-drying of peat by natural means is the only recognised commercially successful method in use to-day. Reduction of the water-content from 90 to 70 per cent. by pressure alone on the raw peat is considered by the author to be the maximum, and he does not consider that drying by artificial heat becomes a practical proposition until this 70 per cent. content is reached, "and even then it is a very doubtful financial proposition."

For use under boilers the water should be reduced to 30–35 per cent.; for gas producers it is stated that several leading manufacturers claim successful working with 60–70 per cent., but Prof. Purcell considers that the possibility of using peat with as high a moisture-content as 60 per cent. is doubtful, and quotes the Canadian authority, Haakel, in support. "If it were permissible [to use such wet peat] it would render the industry less dependent on the weather, extend the peat-winning season, and simplify the whole problem."

Prof. Purcell considers that a clear case for the extended development of the peat deposits exists from an agricultural point of view, for the reclamation of land by removal of the bog and drainage must add to the food-producing capacities of a country. But labour costs are no small difficulty, for, as Sir George Beilby points out in his introduction, the development of a bog with 20 ft. of good peat is in some respects analogous to the proposal to develop a coalfield of similar area containing a single seam of only 15 in. thickness. It is true that the peat bog entails only surface working, but the whole depth has to be worked and 10 tons of raw material excavated and handled for 1 ton of dry peat. J. S. S. B.

Past and Present Sewage Systems.

TWO Chadwick public lectures recently delivered at Colchester by Mr. A. J. Martin dealt with the nature and treatment of sewage. Since the very earliest days there have been codes of sanitary laws, but all kinds of readjustments had to be made as soon as men began to congregate in large cities. These crowded conditions seem to be met most satisfactorily by the water-carriage system, by which the clean water supplied to a town returns ultimately to the sewers charged with all manner of pollution. When sewers were first laid the sewage was discharged straight into the rivers. The results were, of course, disastrous, and successive Royal Commissions were set up to find a remedy. The whole problem of sewage purification was obscure, and very little progress was made for a whole generation. Great hopes were centred in sewage farms as a method of disposing of the sewage, and the various local authorities hoped at the same time to reap a profit from the cheap manuring of the land. Sewage farms, however, rarely pay in a humid climate such as ours, for the land cannot deal with the huge amounts of water brought down from the sewers. Many other methods were tried, but in all of them the investigators failed to recognise the existence of the tiny scavengers which Nature provides to deal with our waste products.

The modern method of sewage purification was evolved after Pasteur's discovery of the bacteria which induce fermentation, and after the work of Warington and of Winogradsky on the nitrifying bacteria in the soil. The purification is carried out in two stages. The first stage is treatment in the "septic tank," through which the sewage passes extremely slowly. The solids sink to the bottom, where they are attacked by anaerobic organisms flourishing there, and ultimately either liquefied or turned into gas. The second stage of the process consists in the oxidation of the dissolved polluting matter. This matter has to be brought into contact with a large supply of atmospheric oxygen in the presence of certain small organisms which are able to oxidise the organic materials. This contact may be effected in the soil, in a specially constructed filter, or in a large volume of water. When soil forms the contact bed, purification is brought about either by "filtration," when the sewage percolates downwards through the soil, or by "broad irrigation," when the sewage merely passes over the soil surface. The method chosen depends on the openness or otherwise of the soil and subsoil. When suitable land is not available, artificial filters are made of broken clinker, destructor slag, etc. These materials provide a home for the nitrifying bacteria. The sewage is allowed to trickle slowly through, and with a good filter a purification of 80–90 per cent. is effected. When purification is allowed to take place in water, the volume of the water into which the sewage flows needs to be about five hundred times greater than the volume of the sewage.

Engineers had just settled down to the septic tank and trickling filter as the standard method for sewage purification when the "activated sludge" process was introduced by Drs. Fowler and Ardern. In this process the whole purification is completed in a tank provided with particles of activated sludge to serve as homes for the nitrifying bacteria. The sludge (*i.e.* solid deposit from the sewage) is activated by being submitted to currents of air for several days. It is then placed in the tank with the sewage, and air forced through for some hours until purification is effected. The drawback of this method is the great bulk of the resultant sludge, and the problem now is to find an economical way of disposing of the sludge so that the plant-food which is contained in sewage shall not be wasted.

Experimental Cottage Building.

IN view of the present housing difficulties, considerable interest has been centred in the results of the experiments in cottage building which have been carried out on the Ministry of Agriculture's Farm Settlement at Amesbury. These results are published in the Weekly Services for May 15 and 22, where we also learn that on Wednesdays for two or three months competent guides have been available to show visitors the experiments actually in progress. The present scheme includes thirty-two cottages, sixteen of which are for comparison purposes, and are built of brick on normal lines of construction, while the other sixteen are more directly experimental. Each cottage consists of parlour, living-room, scullery, bath-wash-house, larder, fuel store, etc., on the ground floor, with three bedrooms on the upper floor. Experiments in building in chalk include a cottage with cavity walls built of blocks made of chalk and cement, one with walls of chalk and cement rammed between shuttering, one with walls of chalk alone (chalk pisé), and one with walls of chalk and straw (chalk cob) built without shuttering. There is also one cottage of monolithic reinforced concrete and two concrete-block cottages with hollow walls. These two cottages are being erected under contract by two proprietary firms; for all the other experimental cottages direct labour is employed. The experiment also includes a pair of timber-framed cottages faced with