or a pip may be thrown away. The official collectors have had advertisements put up in all public buildings, restaurants, stations, etc., to the effect that everyone is to collect the stones and pips, and is to bring them to the collecting centres, mostly instituted in the schools or in the municipal buildings. The school-children are used also to collect acorns and beech nuts; beech nuts make very good salad oil. The collecting centres at Stuttgart published a report in 1917, according to which 150,000 kilos of oil had been extracted from the fruit kernels, acorns, horse-chestnuts, and beech nuts collected by the school-children.

Possibilities of Municipal Salvage

Let us now return to the question of our own salvage, particularly municipal salvage.

The subject is a very large one, and may be dealt with under three heads: (1) What kind of material and what quantity is at present being wasted? (2) How can it best be salved? and (3) How best utilized?

It would be impossible for me, even if I were able to do so, to deal fully with each of these branches of our subject, and I propose to deal only with the first, leaving the second and third to those who have actually been doing them, who therefore know the difficulties and the possibilities from actual experience, and are far more competent than I am to deal practically with the problems of collection and utilization.

I propose, gentlemen, to confine myself to what I shall call the Possibilities of Municipal Salvage.

The quantity of refuse which is "made" annually throughout the country I have estimated at 9,450,000 tons. This figure is based on an allowance of 15 cwts. per 1,000 of the population during 300 days in the year, a figure which is, I think, below the average of the amounts actually collected in most parts of the country. Whether we are justified in applying a figure obtained from the records of towns and cities to the country generally is a matter I shall deal with later, but I would just remind you here that it is the make of refuse which we are at present considering, and not its collection, and there is no apparent reason why the make of refuse should be any less in rural districts than in urban areas.

And now, as to the nature and composition of this refuse. This I have based on actual results obtained by the authorities of Accrington, Bury, Hackney and Sheffield, each of whom have had a careful analysis made of bulk lots of ordinary refuse such as would have in due course been passed through the destructor. The following table shows the average results, and what they represent if applied to the refuse of the country generally:—

Analysis of "Refuse"

Commodity.	Analysis of refuse in Sheffield, Accrington, Hackney and Bury. Average Percentage	Applied to population Great Britain, assuming 15 cwt. per 1,000 population per day during 300 days annually = 9,450,000 tons.	
Fine dust	50.98	4,817,610 say	4,800,000 tons
Cinders	39.63	3,745,035 "	3,700,000 "
Bricks, pots, shales, etc.	5.35	505,575 "	500,000 "
Tins	0.98	92,610 "	90,000 "
Rags	0.40	37,800 "	37,000 "
Glass	0.61	57,645 "	50,000 "
Bones	0.05	4,725 "	4,000 "
Vegetable matter	0.72	68,040 "	68,000 "
Scrap iron	0.06	5,670 "	5,000 "
Shells	0.08	7,560 "	7,000 "
Paper	0.62	58,590 "	58,000 "

These figures may appear to be somewhat fantastic, but I can assure you, gentlemen, that they are founded on facts and are within the bounds of reasonable possibility. Some of you may perhaps say, "The conditions in these towns or cities must be most unusual. I am sure that my refuse is nothing like so valuable." Well, gentlemen, I can only advise you to go back home and make sure. Our first test was made in Sheffield, and the results surprised us, but when the results of the other three came in they all bore out the Sheffield figures. I may say further that several other authorities who have since at our request analysed their refuse have obtained in every case at least similar and in some cases even higher results.

METHODS OF WATER WASTE ELIMINATION IN A 100 PER CENT. METERED CITY*

By H. P. T. Matte,
Superintendent Water Department, Oak Park, Ill.

OAK Park, Illinois, has always been fully metered. All water pumped into the distribution system saving that which is lost through underground leakage, is passed through meters. Furthermore, there is no free water.

Maintenance of Meters

All meters are tested periodically, a practice which has been found profitable, although not required by the Public Utilities Commission. Meters are read every quarter in a continuous reading system, for which purpose the city is divided into six districts so that those found to be not registering can be brought into the shop, repaired and put back into service within a week after being read.

Rigid Collection of High Bills Due to Leakage.

This point is important and has a beneficial effect on the success of the meter system. In other words, although it may be hard on the consumer, he will, if properly impressed, appreciate the importance of watching his fixtures and become educated in spite of himself.

No reduction in bills is made on account of leakage. Short and pointed instructions, which include the policy of the Water Department, are printed on the backs of the water bills. If the complainant has been guilty of the characteristic failing of mankind, that of being unobserving and neglecting to read the information supplied to him every three months, he deserves to pay for his inattention.

This does not mean that the department is heartless and does not admit mistakes. The consumer is given the benefit of the doubt from the first, owing to the fact that the department realizes that it is but human and can be in error in several ways. In fact, the department lets it be known that it is glad to correct its faults. If, however, upon thorough investigation it is found that the water was consumed through leakage or otherwise wasted, the bill must be paid. In order to be fair certain allowances are made if the waste was in the ground and invisible. In this case the lowest rate at which water is sold in Oak Park is allowed, although the quantity consumed may not justify the consumption to be placed in that class.

In any case of high bills, whether this concession is given or not, if the consumer is plainly unable to pay the bill as it stands (these claims being investigated), an installment plan of payment is adopted; but with the provision that the bill must be paid within a year.

*Abstracted from paper read before the Illinois Section of the American Water Works Association.