

The concluding chapter is devoted to the geological history of the "banket" and to the much-discussed question of the mode of origin of its gold. The original deposition of the conglomerates has been variously assigned to lacustrine, fluvial, deltaic, and marine agencies. A marine origin has been most generally favoured, and is here supported. With regard to the genesis of the gold, the well-known "placer," "infiltration," and "precipitation" theories are outlined. The last, in agreement with prevailing opinion, is regarded as untenable. The author, at one time an advocate of the second theory, is now led to adopt that modification of the first to which so many who have followed the controversy have been attracted of late years, viz. that the "bankets" are ancient and highly modified "placers" in which the originally detrital gold has been dissolved by high-temperature solutions and redeposited. This has entailed the loss of its detrital form, and the assumption of the crystallised state and the association with secondary minerals which it now exhibits. There is much to be said for this view, since it reconciles the facts which point to a "placer" origin with those which prove deposition from solution, and from which "infiltration" of the gold from outside has been erroneously inferred.

The author is to be congratulated upon his remarkably fine series of illustrations. The collection and preparation of the material for these must have involved the expenditure of much time and labour. They add greatly to the value and interest of the volume.

C. G. C.

#### MUNICIPAL ENGINEERING.

*Municipal Engineering Practice.* By A. Prescott Folwell. Pp. xi+422. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1916.) Price 16s. 6d. net.

THE author defines the purpose of municipal engineering to be the planning, constructing, and maintaining of the publicly owned features and utilities of a city. He points out that its practice must conform to natural laws and legal enactments. A municipal engineer, therefore, should be acquainted with various branches of science and engineering. There is not much reference to scientific principles in this treatise; it is mainly a clear and interesting descriptive account of the methods and devices of city engineering, and that entirely from an American point of view. The large subjects of water supply, sewerage, and street-paving are fully dealt with in other text-books, and are omitted or slightly discussed, but the author thinks that information as to street cleansing, comfort stations, and similar matters is not readily available, and that city planning, street lighting, etc., require treating from the point of view of the taxpayer and the city engineer.

Methods of estimating and forecasting population are described, and some striking statistics are given of the growth of American cities. In

NO. 2511, VOL. 100]

a chapter on town-planning, the checker-board, ring, and radiating systems of streets are examined, and an account is given of broad roads divided for automobile, truck, and street railway services. As might be expected, the construction of streets in the States is often less satisfactory than here. For instance, in St. Paul there are 321 miles of plank footways, which have a life of only three to six years. It is significant that judgment suits for accidents occurring on them cost the city nearly 3l. per mile per annum. Concrete footways are now most generally adopted with concrete kerbs.

There is a good chapter on surveys in cities, which are very systematically carried out in America, and plotted records of all the surface and sub-surface structures are preserved. In some cities a large use is made of photographic records, one purpose being to preserve records which may be valuable in future lawsuits. Sprinkling macadam or gravel roads with oil once to three times a season is a practice said to have become quite general, but we think is unknown here except in the different form of tar spraying. The oil is said to be distributed by an ordinary water-sprinkling cart. The disposal of city waste and the laying out of parks and planting shade trees are amongst other subjects described.

#### A MANUAL ON EXPLOSIVES.

*A Short Account of Explosives.* By A. Marshall. Pp. viii+96. (London: J. and A. Churchill, 1917.) Price 5s. net.

THE two volumes comprising the second edition of Mr. Marshall's treatise on explosives have been recently reviewed in these columns, and the present small book consists of a condensation of parts of the larger treatise in order "to present in a clear and simple manner the main facts concerning explosives and their properties."

After a short introductory chapter, the author deals in the succeeding six chapters with the preparation and properties of black powder and similar mixtures, nitrocellulose, nitroglycerine, military and commercial high explosives, and smokeless powders. Another chapter is given to fireworks, and the remaining three chapters to the properties of explosives, ignition and detonation, and precautions to be taken in the manufacture, handling, and storage of explosives.

Referring to the large Congreve war-rocket of 24 lb. weight, which was used with good effect at Copenhagen, Walcheren, and Leipzig, Mr. Marshall expresses the opinion that the future may see its use revived. Its great defect is stated to be want of accuracy, but an obvious disadvantage is that rockets carry their own propulsive charge, so that for a given destructiveness they have to be relatively very heavy. Trials have been made by the Germans in the present war, but rockets are unable to compete with guns, howitzers, and trench mortars.

In his concluding pages Mr. Marshall deals