been amended in such manner as to protect the public, without hampering the use of steam. A special type of engine, with vertical cylinders, carried well up above the axles (to secure them from injury by mud and dust, and to make them readily accessible), and fitted with long connecting-rods, coupled directly to the leading axles, has been applied to the street-cars. All four wheels are connected by coupling-rods, as in the locomotive, and the exhaust steam is concealed by various expedients. The surface-condenser was considered more economical than superheating, to produce efficiency, and air-condensers were thought practicable. Engine and passenger-car were often combined, — a method used in various American systems, — in one of which (Rowan's) the engine can be removed, and another substituted, in a few minutes. Depreciation was allowed for at 10%. Depreciation on the line alone was taken as 3%. The cost of operation was stated at 2.28 pence per mile, while the total of all expenses was given at 9.33 pence per mile, and every penny per mile above this figure should give 2.2% in dividends. The line intended for such steam-traffic should be very substantially built, and large cars and moderate fares were advised.

Mr. Shellshear gave an account of the street-railways of Sydney, New South Wales, all of which are worked by the ordinary railway system. The number of passengers carried in 1882, on twenty-two miles of road, was 15,269,100, or about 200,000 per mile; and the earnings were over $40,000 per mile, or about 2% per mile. The gauge was 4 feet 8½ inches, and the number of motors employed was 57, including several American (Baldwin) tank-engines, which work more smoothly than the English or home-made engines. The government is having other steam-cars, on the American system, built by the Baldwin works. The result has proved that horse-traction must yield to mechanical power.

MORTILLET'S CONCLUSIONS REGARDING EARLY MAN IN EUROPE.

1. During the tertiary age, there existed a being intelligent enough to produce fire and to fabricate stone implements.

2. This being was not yet man: it was his precursor, — an ancestral form, to which I have given the name of the *man-ape*.

3. Man appeared in Europe at the beginning of the quaternary period, at least 230,000 or 240,000 years ago.

4. Our first human type was that of Neanderthal. This type, essentially autochthonous, was slowly modified and developed during the quaternary period, resulting in the type of Cro-Magnon.

5. His industry, very rudimentary at first, developed progressively in a regular manner, without shocks. This proves that the progressive movement went on upon the spot, without the intervention of propagandism and invasion from abroad. It was therefore really an autochthonous industry.

6. The regular development of this industry has enabled me to divide the quaternary period into four epochs, — first, the *chellean*, anterior to the glacial period; second, the *mousterian*, contemporaneous with it; third and fourth, the *solutrian* and the *magdalenian*, posterior to it.

7. Quaternary man, mainly a fisherman, and especially a hunter, was acquainted neither with agriculture nor with the domestication of animals.

8. He lived in peace, entirely destitute of religious ideas.

9. Towards the end of the quaternary period, in the *solutrian* and the *magdalenian* epochs, he became an artist.

10. With the present condition of things, there have come invasions from the east which have profoundly modified the population of western Europe. These have brought thither ethnic elements entirely new, and in great part brachycephalic. To the simplicity and the purity of the autochthonous dolichocephalic race, there have succeeded numerous crosses and mixtures.

11. The industry is found to be profoundly modified. Religious ideas, the domestication of animals, and agriculture have made their appearance in western Europe.

12. This first invasion, which took place at the Robenhausen epoch, set out from the regions of Asia Minor, Armenia, and the Caucasus.

PARKER'S TEXT-BOOK OF DISSECTION.

THIS book is well printed, and presents an attractive appearance. Of the seventy-four woodcuts, all are good, some excellent. The plan of the book is similar to that of Huxley and Martin's 'Elementary biology,' and, like it, is designed as a course of laboratory instruction. Our author deals with the anatomy of the lamprey, skate, cod, lizard, pigeon, and rabbit. It will be seen that the anatomy of a representative form of each of the vertebrate classes except the Amphibia is taken up. A type of this latter group was evidently omitted with purpose, since Huxley and Martin's 'Biology' takes up the anatomy of the frog. The anatomy of the types selected is considered from an independent point of view, and the author makes no attempt whatever to give a detailed or complete account of their structure. He dwells on the more important points, taking up the anatomy in quite as detailed a manner as desirable, and perhaps more fully than can be compassed by the student in most of our laboratories. General directions are given as to instruments, methods of dissection, and preparation, followed by more detailed instructions about dissection of the types con-

A course of instruction in zoötomy (Vertebrata). By T. JEFFERY PARKER, B.Sc., London professor of biology in the University of Otago, New Zealand. With seventy-four illustrations. London, *Macmillan & Co.*, 1884. 23+397 illustr. 8°.