to make the second known discovery of Himiarite inscriptions, of which there were nine. These were on a block of granite of enormous size, under whose shade travellers have refreshed themselves for many centuries, as these inscriptions, supposed to be more than two thousand years old, sufficiently indicate. They are accompanied by rude outlines of horsemen brandishing the sword and lance, precisely similar to sketches made in Huber's note-book by a living Arab chief at Haïl. It is probable that the first Himiarites established themselves in the Tuarin valley on their southward migration. In the numerous revolutions which have devastated Arabia, it is probable that the valley has been many times depopulated.

Farther on, the party passed a singular rock, which, in falling from the crag, had perched itself on a granite mass by three sharp points. Being somewhat concave below, it resounds like a rather heavy bell to the strokes of a cane, — an infallible sign, according to the Arabs, of concealed treasures. Their camp, a few miles beyond, was in the midst of a remarkable ravine of a uniform width of about fifteen hundred feet, bordered by granite walls about nine hundred feet in height, presenting in the sun remarkable hues of red, violet, brown, and rose. The perfectly level sandy soil was of a peculiar rose color, and the impression conveyed was of a gigantic street newly swept and silent. Access to the Gou valley was obtained through a very narrow ravine encumbered with fallen blocks, hardly affording passage for a camel. Above this it enlarges into a circular plateau continued on the other side by a long boulevard of magnificent palms. The spot seemed a terrestrial paradise. Flocks of birds, so rare in this parched land, delighted the eye, and their songs broke the silence of the desert in a delightful manner. Vegetation was luxuriant and beautiful; and a flowing spring refreshed the party, though its temperature was not less than 82° F.

In travelling about the Jebel Aga, ascent was found practicable only in a very few places. The walls rise abruptly without foot-hills, and are of a gray, red, or reddish-brown granite of coarse grain composed of quartz, with large crystals of red and white felspar with grains of pegmatite. The dip of the beds is about 55° toward the horizon. The wind in this part of Arabia blows always from the west.

The road passing through the region of Jebel Selma, at no great distance from the Jebel Aga, traverses an isolated volcanic district, where the passage is often only wide enough for single file. Several craters, one twenty-five hundred feet across, still remain, and, though now safe for travellers, were formerly the fastnesses of Arab robbers, whose attacks made the region deserve, even more than its natural character, its Arabian name of Gehenna. Beyond, just where the grits replace the basaltic rocks, lies the little town of Feyd, containing some forty houses. Anciently this was a site of renown, for whose determination Ritter vainly spent many pages of discussion; but its splendor has departed. Around it, at no great distance, are scattered low hills of volcanic origin, in some of which the craters are still evident. Water lies under a bed of basalt, very hard, and six or seven feet thick, covered with about thirty feet of sand and gravel. The wells, singularly enough, are connected by subterranean tunnels. This water, accessible only at the cost of so much labor, must be raised to water the palm-trees, and is reported to be gradually diminishing, to which the decay of the ancient city is probably due. The desert around Feyd is called Aba-el-Krûs.

Thence toward El Kehafah the path traverses a region of volcanic rock, which emerges from the surface on either hand in a singular manner. It looks as if the whole region had been once a boiling liquid lava which had been suddenly congealed, leaving solidified bubbles twenty-five to thirty-five feet in diameter, which appear at every step. A little sand is found here and there in crevices, with an occasional shrub growing in it; but apart from this, the desert is absolutely naked rock of indescribable desolation, — a corner of the real Arabia Petraea. The name of this waste is El Sarâfah. In this region, according to the Arabs, there are some ten rainy days at the beginning of winter: the rest of the year is literally dry. Beyond Kehafah several small oases were seen of a singular geological structure, which is, however, common in the region. They consist of elliptical dish-like depressions, dipping slightly toward the north, their axes north-west and south-east, and about twenty-four kilometres in length by half as much in width. The margins of these basins are abruptly elevated, rocky walls, about thirty or forty feet in height. The wells pass through twelve or fifteen feet of gravel and rock, beneath which is water in abundance, but too bitter to be potable. Drinking-water is accessible in but two or three places. The road from Kehafah to 'Ayoun passes the boundary of the safe country, and enters the region of robber nomads. A singular rock, much resembling the sphinx in form, partly covered with illegible Himiarite and Arabic inscriptions, lies isolated near the route, and beyond a much smaller one, from which a few inscriptions could be transcribed. The inhabitants of this region are small, shrivelled, and sickly-looking, in strong contrast with the fine physique of the people of El Jebel, which the traveller had left. They are violent fanatics, from whom his safe return was fortunate. The mean temperature of the soil here was 84°; and during one day, with a hot wind, the thermometer rose to 122° F. in the shade.

STEAM ON STREET-RAILWAYS.

THE Hon. R. C. Parsons recently read a paper before the British institution of civil engineers, in which the progress of steam-locomotion on street-railways was very fully considered. It was asserted that very little success had attended the efforts made to introduce steam as a motor on the common highway, while the privileges accorded by special legislation to the street-railway companies have led to comparatively great success in that direction.

The British 'Board of trade' regulations have

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°.