

Research Items.

GYPSY FOLKLORE.—The new series of the Gypsy Lore Society's Journal is being actively conducted by its energetic secretary, Mr. T. W. Thompson. The last issue (Third Series, vol. i., part 3) contains an excellent article by him on the Gypsy Grays as tale-tellers, which describes the methods by which the incidents of their stories are manipulated. This has a much wider interest than is implied by its title, and students of folk tales will find that it throws much needed light on the construction of these narratives.

HOCKEY IN ANCIENT GREECE.—An ancient Greek sculptured relief recently discovered in Athens, according to the *Times*, gives evidence that the Greeks played ball games other than with the hand. The relief represents six naked youths taking part in a game bearing every resemblance to modern hockey. The curved stick used may possibly supply an explanation of the singular curved object carved in relief on some of the votive offerings found at Sparta. These have been called "sickles." It is difficult to say why this implement should have been dedicated to Artemis, but the word "sickle" may have been the current slang for a boy's hockey-stick.

ROMAN REMAINS IN LONDON.—Recent excavations in the City have led to important discoveries. It seems to be proved that the ancient church of St. Peter's-upon-Cornhill was built inside of what was once a Roman fortress, which future investigation is expected to show was the first fortified camp of the Romans. If so, it is possible that it was built immediately after the re-establishment of order subsequent to the revolt of Boadicea. Mr. W. C. Edwards, the archæologist in charge of these investigations, believes that during the next ten years more Roman discoveries will probably be made in the City than have been made for centuries. The excavation recently struck what is probably the most ancient wall yet found in London. At one point it is 5 feet thick, and above the footings were courses of tiles, four abreast, each 13 inches broad. Rooms were added to it with plastered walls which appear to be of imitation alabaster, the wall being overlaid with a layer of white cement, almost as thin as paper, on which designs had been painted by a very skilful artist. It is now clear that Gracechurch Street was not Roman: it probably belongs to Saxon times, and was the work of Alfred the Great.

ARCHÆOLOGY IN PALESTINE.—Among the obligations undertaken by Great Britain in connexion with the control of Palestine is that of promoting archæological research. It was a condition of the scheme that in the Advisory Board for Archæology other nations should be represented. The first work which will now be undertaken is the excavation of the ancient City of David on Mount Ophel, immediately south of the existing walls of Jerusalem. Three different attempts have been made to probe the secrets of the hill, and though attended with some measure of success, practically the whole of Jebus, the original stronghold, the Palace and Millo of David, and in all probability the tombs of the Kings of Judah, await investigation. An area of ten acres has been preserved by the Administration, and this is now available for excavation. East of Jordan an immense field remains practically untouched, and many of these sites are of importance equal to that of Palestine itself. Especially at Jerash, the ancient Gerasa, there are wonderful remains of the Roman city, which show that it was one of the most imposing cities of the Roman period. The excavation of these

Palestine sites is likely to throw welcome light not only on the history of the Hebrews but on the obscure annals of the nations who preceded them, and it may be hoped that the Palestine Exploration Fund, which counts among the names of its illustrious servants that of Kitchener, will receive adequate support in carrying out the well-arranged programme of investigation which is now laid before the scientific world.

UPPER CRETACEOUS GASTROPODS OF NEW ZEALAND.—Certain Upper Cretaceous gastropods of New Zealand, originally referred to Mr. H. Woods for description, were on his recommendation forwarded to Dr. O. Wilckens, then at Strasbourg, to deal with. The intervention of the war and consequent removal of Dr. Wilckens to Bonn delayed the completion of the task, and the finished monograph as rendered into English by the author himself has recently been issued as Palæontological Bulletin No. 9 by the Geological Survey Branch of the New Zealand Department of Mines. The major portion of the fossils studied are of Upper Senonian age. While these include a few species peculiar to New Zealand, resemblances can be traced in many examples to species from beds of equivalent age in North Germany, Chili, Patagonia, the Antarctic Regions, and South India. Of the indigenous forms the most striking is the remarkable *Conchothyra parasitica*, and Dr. Wilckens gives a very careful account of its strange growth and development. The plates accompanying the monograph are deserving of much praise, and there is a map showing the localities whence the fossils were obtained.

MARINE FOSSILS IN CENTRAL INDIA.—The General Report of the Geological Survey of India for 1921 contains a confirmation, and some further particulars, of the discovery of marine fossils in the lower Gondwana series of Central India, which was reported in some of the Indian newspapers about nine months ago. The discovery, which was made by Mr. K. P. Sinor, State Geologist to the Rewah Durbar, at Umaria, situated almost centrally in the broadest part of the Peninsula, consists of a shell band, about 3 inches thick, composed almost entirely of shells of the genus *Productus*. Below the shell band are quartz grits which pass up, through the band, conformably into sandstones of Lower Barakar age, the bed itself lying not far from the junction of the Gondwana rocks with the underlying gneiss, in beds which are usually regarded as of Talchir age. The discovery has been further investigated by Mr. P. N. Mukherji, field collector of the Survey, who added two specimens of *Spiriferina* to the fauna. The *Productus* has not yet been identified, but it is new to India; the *Spiriferina* is close to, and probably identical with, *S. cristata*, var. *octoplicata*. The fossils, therefore, are not of great assistance in determining the precise age of the band, but the discovery of marine conditions in the centre of the Peninsula, where no marine rocks of later than probably pre-Cambrian age had previously been found, is of great interest and importance. Dr. L. L. Fermor, the officiating director, by whom the report is made, discusses the question of whether the sea lay mainly to the north, or the west, of the newly discovered *Productus* locality. In either case the discovery, though of interest as marking a greater extension of the sea than had been previously suspected, does not materially alter the conclusion that the Indian Peninsula is a region which has been continuously dry land throughout the whole period covered by the sequence of fossiliferous rocks.

THE DISTRIBUTION OF TEMPERATURE IN SCANDINAVIA.—The Meteorological Institute of Sweden has published an important paper and series of charts by Mr. H. E. Hamberg on thermosynchrones and thermoisochrones in the Scandinavian peninsula (*Bihang till Meteorologiska lak utagelser*, Bd. 60, 1918 (1922)). In tables and charts, founded on the observations of 232 Swedish and 83 Norwegian stations, Mr. Hamberg gives the mean annual dates at which certain temperatures reign. The temperatures are reduced to sea-level for this purpose, although Mr. Hamberg fully realises that for certain geographical uses the value of the charts is thereby lessened, and he gives two pairs of charts, spring and autumn, one for 12° C. and the other for 0° C., in which the actual temperatures are utilised. A second series of charts indicates the average number of days with a temperature above or below certain figures. The curves on these charts Mr. Hamberg terms thermoisochrones. The charts, which are small but very clear, are most useful for geographical purposes.

SPELL OF WARM WINTERS IN EUROPE.—The abnormal winter warmth recently experienced in Central Europe, embracing England, is dealt with in the *Meteorological Magazine* for September by Mr. C. E. P. Brooks, of the Meteorological Office. A chart is given showing the differences of the mean temperatures for the winter, comprised by the months December, January, and February, for the years 1911 to 1920, and the long period averages for the combined winter months, mostly covering the years 1851 to 1910. At Budapest the winters of the past ten years have on the average been more than 4° F. warmer than the normal winter. At Zürich the excess is 2°·6 F.; at Paris, 2°·1 F.; and at Kew, 1°·8 F. On the Atlantic sea-board the winters of the decade in question have been slightly colder than the normal. There is no appreciable difference of temperature for the rest of the year, the summer months for the years 1911 to 1920 having been, on the whole, somewhat cooler than the average. The abnormal warmth of the winters was not confined to low levels; the mean winter temperature for the ten-year period at St. Gothard, 6877 feet above sea-level, is 1°·9 F. above the normal. The author suggests a tentative explanation connecting the abnormal warmth with the general decrease of sunspot numbers since the nineteenth century. Taking the mean winter temperature at Greenwich for the ten-year period, 1911 to 1920, it is 1°·5 F. above the 60 years' average, and the mean was above the normal in 8 winters out of 10, the excess being more than 3° F. in 4 winters. In the ten-year period from 1886 to 1895 the mean winter temperature at Greenwich was 1°·9 F. below the normal for sixty years, and in 8 winters out of 10 the mean was below the average, the deficiency amounting to 3° F. or more in 3 winters; this is a different period from that given by the author and with an opposite effect.

GLARE FROM MOTOR HEADLIGHTS.—The descriptions of motor headlights exhibited at the meeting of the Optical Society on May 11 will be found in part 4 of volume 23 of the Transactions of the Society, together with a report of the discussion of the conditions which a satisfactory headlight should fulfil. In America these conditions are that 100 feet ahead of the car at a point 5 feet above the horizontal, the illumination must not exceed that due to a lamp of 750 candle power. The conditions laid down in this country by the Ministry of Transport relate to the width and height of the beam and place no restriction on its intensity. The reconciliation of the requirements of the driver and the pedestrian or driver he is approaching is difficult, but the general opinion of those who took part in the discussion

appeared to be that the beam should have a candle power of 3000 in a direction half a degree below the horizontal and be reduced to 500 or 600 candle power in a direction one degree above the horizontal. As the glare effect is due to contrast, it was further suggested that the car body and the road at the side of the car should be illuminated to some extent as well as the road in front.

A NEW THEORY OF VISION.—A photo-electric theory of vision has recently been put forward by Dr. F. Schanz of Dresden and has been discussed in the *Zeitschrift für Augenheilkunde*. At present it is incomplete, but according to a paper in vol. 54 of the *Zeitschrift für Sinnesphysiologie* the author hopes to fill in the gaps by work on which he is at present engaged. In outline it is as follows: Light on entering the eye is absorbed by the visual purple, which as a result emits electrons at speeds which depend on the wave-length but not on the intensity of the incident light; that is, the visual purple is photo-electric. The electrons impinge on the rods and cones and produce the sensation of light. If their velocities do not differ widely they are equalised during their passage to the rods and cones and produce a single sensation corresponding to the mean velocity; but if they differ materially the interval between their emission and their arrival at the rods and cones is not sufficient to equalise them and they produce distinct sensations. Over a range of wave-lengths of 1×10^{-4} cm. equalisation is produced, but if all wave-lengths over a range double this are present, the sensation of white is produced, whether the range be e.g. from 4 to 6 or from 6 to 8×10^{-4} cm.

TESTING FOR VITAMINS.—Investigators are searching actively for some chemical means of recognising the presence of the vitamins in food materials, and the discovery of such a test would enormously increase the facility of research on these elusive substances. So far all the suggestions made have failed to withstand a critical examination. In a recent paper in the *Analyst*, Messrs. Drummond and Watson point out the close relation which exists between the presence of vitamin A in fats and the well-known reaction given by liver oils, which consists in the production of a purple coloration when the oil is dissolved in an organic solvent and a drop of sulphuric acid is added. All the liver oils of mammals, birds, and fish examined by the authors gave the reaction, but they also find that it is given, although less strongly, by the body fat of some animals and by butter. In striking agreement with the behaviour of vitamin A, the power of producing the coloration is lost when a current of air is passed through the fat at 100° C. but not when the fat is heated at this temperature in absence of air. Again, when the fat is hydrolysed it remains, with the vitamin A, in the unsaponifiable fraction. Moreover, the intensity of the reaction was found to be roughly proportional to the vitamin A content of a series of fish-liver oils. The livers and fat of pigs and rats fed on diets deficient in vitamin A did not give the reaction, but this reappeared when the deficiency was made good. It is obvious that there is a close parallel between the two properties, and the authors, without claiming that the test actually indicates the presence of the vitamin, suggest "that the association may be of some significance." The necessity for this caution is indicated by the facts that although the marine diatom *Nietzschia* has been shown to be rich in vitamin A the oil extracted from this organism did not give the purple colour test with sulphuric acid. A similar negative result was obtained with plankton oil, although the reaction was given by certain marine algæ.