subject; of these thirty-two received the University's diploma in Public Health.

Mr. H. Yule Oldham, University Lecturer in Geography, has been admitted by incorporation to the degree of M.A.

The *University Reporter* of December 3 contains a full report of the speeches delivered at a meeting in King's College for the purpose of promoting the foundation of a memorial library of Oriental literature in honour of the late Prof. Robertson Smith, editor of the *Encyclopædia Britannica*.

## SCIENTIFIC SERIAL.

*American Meteorological Journal*, November.—Cyclonic precipitation in New England, by Prof. W. Upton. A list of cyclones was made out, including nearly all in which the precipitation had been general over New England, and the amounts and distribution noted on maps, with regard to the track of the minimum pressure. The velocity with which the storms passed ranged from fifteen to sixty miles per hour. The tables show that the heaviest rainfall is rarely found along the central path of the storm. Of the cyclones which came from the west *across* New England, only ten out of sixty-nine had their heaviest precipitation on or near the storm-path, while forty-five had the maximum area on the right of the storm-track; similarly, out of eighty-four cyclones which moved from the west *near* New England, seventy-three had their maximum precipitation south of the storm-track. Further comments are reserved until the results of a study of the storms coming from the south are given.—The barometer at sea, by T. S. O'Leary. This paper deals with observations made chiefly by captains of American vessels. The author considers that a great step forward was made when the number of observations was reduced from twelve to one daily, the result being that the number of observers has increased nearly eight-fold. Another valuable feature is that the leaves of the log-books are forwarded to the central office as soon as opportunities are offered, so that the captains can see their observations made use of without delay. A simple plan for obtaining comparisons of the barometers has been adopted with very satisfactory results. The observers when in port record readings at certain hours, and forward them on post-cards to the central office; a copy of the "corrections" is immediately returned to them, and copies filed for use and future reference.

## SOCIETIES AND ACADEMIES.

### LONDON.

**Royal Society**, November 15.—"The Pigments of the Pieridæ. A Contribution to the Study of Excretory Substances which function in Ornament." By F. Gowland Hopkins.

The wing-scales of the white Pieridæ are shown to contain uric acid, this substance practically acting as a white pigment in these insects. A yellow pigment, widely distributed in the group, is shown to be a derivative of uric acid, and its artificial production as a bye-product of the hydrolysis of uric acid is demonstrated. That this yellow pigment is an ordinary excretory product of the animal is indicated by the fact that an identical substance is voided from the rectum on emergence from the pupa.

These excretory pigments, which have well-marked reactions, are apparently confined to the Pieridæ, and are not found in other Rhopalocera. This fact enables the observation to be made that when a pierid mimics an insect belonging to another group, the pigments of the mimicked and mimicking insects, respectively, are chemically quite distinct.

Other pigments existing, not in the scales, but between the wing membranes, are described, and are shown sometimes to function in ornament. The analysis, and the properties of the yellow scale-pigment are fully discussed in the paper.

**Physical Society**, November 23.—Prof. Rücker, F.R.S., President, in the chair.—Mr. Womack read a paper on a modification of the ballistic galvanometer method of determining the electromagnetic capacity of a condenser. The condenser is placed in parallel with one arm (S) of a Wheatstone's bridge arrangement of non-inductive resistances. A balance for steady currents having been obtained, the condenser is placed in circuit, and the throw on depressing the battery key determined. The condenser is then thrown out of circuit, and the proportionality of the arms of the bridge disturbed by changing the value of S to S + $d$S. The steady deflection due to this change is then read. From these two readings and the known values of S and $d$S the capacity is immediately determined. In practice readings of deflection may be taken with equal positive and negative values of $d$S. To avoid changes of E.M.F. of the battery, the author finds it best to use a reversing key in the battery circuit, and to observe the throw on reversing the current instead of on simply breaking it. One advantage of the method is that there is no need to know the galvanometer- or battery-resistance, and the author points out that it may be of service in the simultaneous determination of the resistance and of the joint capacity and inductance of a submarine cable or of a telephone or telegraph line. Prof. Perry asked what were the advantages of the method as compared with the Rayleigh-Sumpner method. Mr. Blakesley thought that the correction for damping in the ballistic part of the experiment might be avoided if in the second part the disturbance of balance due to the increment $d$S were measured by half the first throw of the needle on making the galvanometer circuit, instead of by the steady deflection. He doubted whether reversing the current in the battery circuit would have just twice the effect of simply breaking the circuit. In reply, Mr. Womack said he had not tried the method of reading suggested by Mr. Blakesley, but with regard to the reversing of the battery circuit, that was found to give in practice as nearly as possible twice the deflection which resulted from simply breaking.—A paper, by Prof. S. P. Thompson and Mr. Miles Walker, on mirrors of magnetism, was read by Prof. Thompson. It was pointed out that, corresponding to the theory of electric images produced by insulated conductors, there is a theory of magnetic images produced by bodies of infinite magnetic permeability. A magnet pole in the latter theory is the analogue of an electric charge in the former, and a body of infinite magnetic permeability is the analogue of an insulated conductor (which is electrostatically indistinguishable from a body of infinite dielectric capacity). Experiments were made to determine how far the magnetic images due to thick sheets of iron accorded with those deduced by theory for the case of infinite permeability. The image of a north pole in an infinite plane sheet should consist of a south pole of the same strength at a point coinciding with the optical image of the north pole, together with an equal north pole distributed uniformly over the surface of the infinite sheet, as a free electrical charge would be, and so exerting no finite action. Working at distances of a few inches in front of the surface, a sheet of iron a few feet in length and breadth, and a couple of inches thick, was found to realise the theoretical conditions with very tolerable exactness. In a coil of wire placed on one side of the sheet a current was started or stopped, and the electromotive impulse produced in a subsidiary exploring coil was detected by means of a ballistic galvanometer. That the effect of the actual mirror was equivalent to that of the theoretical image, was verified by substituting for the iron a coil equal and similar to the first, and coinciding with its optical image. Sending the same primary current as before round the two coils (with due regard to its direction in the second coil), hardly any appreciable difference in the secondary impulse was observed. This was found to hold good whether the original primary coil had its axis perpendicular or oblique to the plane of the magnetic mirror. Some observations on spherical sheets were also recorded, but in this case the conclusions were less simple. The paper was followed by a discussion, in which Mr. Boys, Prof. Perry, Prof. Ayrton, Dr. Burton, Mr. W. Bailey, and Prof. Carey Foster took part.—Prof. Ayrton exhibited a student's apparatus for verifying Ohm's law, designed by himself and Mr. Mather. The current flowing through a circuit is to be measured (not necessarily in terms of any defined unit) by means of a galvanometer, while the potential-difference between two fixed points is measured by means of an idiostatic electrometer. Within small limits of experimental error, the current and potential-difference are found to vary in the same proportion; but the electrometer and its manner of use constituted the chief interest of the paper. The fixed and moving parts (inductors and needle) are alike cylindrical in form (the term being understood in its most unrestricted sense), and the generating lines are vertical. There is a vertical axis of symmetry, such that the disposition of these cylindrical parts would remain unchanged if the instrument were rotated through 180° about the axis. The needle is hung by a very thin phosphor-