In Section C (Geology and Mineralogy) Sir Douglas Mawson, president of the Section, gave an address on "The Igneous Rocks of South Australia—a Brief Survey of Present Knowledge Relating Thereto." Igneous activity in South Australia appears to have been restricted to four periods: the older pre-Cambrian, as seen at Port Lincoln and Carrow; middle pre-Cambrian, shown by uncrushed granites in the Eyre Peninsula; late pre-Cambrian, as in parts of the Mt. Lofty Ranges; and Tertiary, as in the effusions in the Mt. Gambier district and on Kangaroo Island.

Prof. Launcelot Harrison, president of Section D (Zoology) gave an address on "The Composition and Origins of the Australian Fauna, with special reference to the Wegener Hypothesis." The Australian fauna seems to have had three main origins: an Autochthonian, established in the south-west in very early times; a Euriotian, probably derived by way of the Antarctic continent in Mesozoic or Miocene times; and a more recent Papuan element. The address served also to open a joint discussion between Sections A, C, D, E, and M on "Biological, Geological, and Physical Evidences regarding the Relationship of Australia to other Lands, with special reference to the Continental Drift Theory."

In Section E (Geography and History), Prof. Ernest Scott took as the title of his presidential address "The Discoveries of the Western Australian Coast, with especial reference to Dampier and D'Entrecasteaux," in which he gave the results of an examination of documents bearing on the history of the ill-fated D'Entrecasteaux Expedition in the Archives Nationales in Paris.

The presidential address in Section F (Ethnology and Anthropology), by Prof. F. Wood Jones, contained caustic comment on the treatment meted out to the Australian aborigines in the past, and urged that the only way in which the race can be saved from extinction is by establishing native reserves, where the natives can live their own lives under natural conditions and be protected from pauperisation.

In Section G (Social and Statistical Science) the president, Major L. F. Giblin, took as the title of his address "Federation and Finance—an Examination of the Financial Relations of States to a Federal Commonwealth." In this he showed that the present financial arrangements between the Commonwealth and the States, including taxation, are almost exclusively on a *per capita* basis, which is inequitable, as wealth and population do not run parallel.

Sir Charles Rosenthal, president of Section H (Engineering and Architecture), was unable to attend, but forwarded his address on "Nation Building," which was read to the Section. The address dealt with the dependence of the progress of civilisation on engineering and architecture, and amongst other things urged the necessity on strategic and economic grounds for a uniform gauge for the Australian railways.

In Section I (Sanitary Science and Hygiene) the president, Dr. F. S. Hone, gave an address on "Notification and its Relation to the Prevention of Disease," in which he showed the great need for co-ordination and reform of the methods of notification in use in the Australian States. To make notification effective for controlling disease, the number of permanent medical officers of health will have to be increased.

In Section J (Mental Science and Education) Mr. P. Board spoke on "Economic and Social Values in Education." Education creates the soul of the nation, acting as the sum of the effects of all the teachers on all the pupils. An extension of the school age is desirable, but will probably require some form of family endowment.

Mr. C. E. Lane Poole, president of Section K (Agriculture and Forestry), who was unable to attend, forwarded an address on "Forestry and Land Settlement." Forestry is agriculture on a long rotation, and to convert good forests into poor grazing land, as so often happens in Australia, is economically unsound; also the wholesale destruction of forests affects the climate adversely.

Prof. J. Douglas Stewart addressed Section L Veterinary Science) on "The Relationship of Veterinary Science to the Prosperity of the State." Heavy losses of stock are caused annually by parasitic and other diseases. These can be combated successfully only by preventing infestation, but this requires a knowledge of the life history of the parasites, which in many cases we do not possess. Much research is needed, but the veterinary services of the Commonwealth are sadly undermanned.

In Section M (Botany) Prof. A. J. Ewart gave his address on "Past, Present, and Future Development of Botanical Science," dealing with the killing of weeds by poison, which at present is done on purely haphazard and empirical lines, the need for botanical research in Western Australia, and modern views on the ascent of sap in trees.

In the new Section N (Physiology and Experimental Biology) Prof. W. A. Osborne gave the presidential address on "The Study of the Reflex." The response to changes in environment is one of the most obvious manifestations of life, and the higher the organism the wider the range of environmental changes to which it is sensitive. In man the highest form of reflex action is found in the emotions. Prof. Osborne suggested that many body changes that seem without purpose in the individual become clear when the individual is regarded as a member of a society, as they express the interaction between him and his fellows.

Most of the sections had very full programmes. Intersectional discussions were a prominent feature of the meeting, the following discussions being held in addition to those already mentioned: "Catalysis and Enzyme Action" and "Hydrogen-ion Concentration" (Sections B and N), "Teaching of Hygiene in Schools" (I and J), "Soil Classification and Survey" (B, C, K, and M), "Adult Education and the Workers' Educational Association" (E, G, and J), "Poison Plants" (B, K, L, and M), "Water Supplies—Domestic, Agricultural, and Pastoral" (B, C, H, I, K, L, and N), "Treatment of Low-grade Ores" (B and H), "Biological Control of Pests" (D, K, L, and M), and "Timber Preservation" (B, H, K, and M).

Danish Observations of the Planet Jupiter.[1]

THE observations of the planet Jupiter made at the Urania Observatory, Copenhagen, during the period 1919–24 are summarised in the publication before us. By far the greater part of the report, however, deals with the observations secured during the very remarkable apparition of 1919–20—an apparition which saw the revival of the well-known hollow in which the Red Spot normally lies, the south tropical disturbance, and the south component of the south equatorial belt—all of which had disappeared in the earlier part of 1919. In the succeeding apparitions, bad meteorological conditions, and later the

[1] La surface de la planète Jupiter 1919–1924. Par C. Luplau Janssen. (D. Kgl. Danske Vidensk. Selsk. Skrifter, naturvidensk. og mathem. Afd., 8 Række, XI., 1). Pp. 88+7 plates. (København: Andr. Fred. Høst and Son, 1926.) 10 kr.

low position of the planet in the sky, rendered systematic work impossible. We accordingly limit our reference to the discussion of the 1919–20 observations.

The work done may be divided into three parts:

(1) Micrometrical measures for determining the co-ordinates of individual spots.

(2) Micrometrical measures for determining the latitudes of the belts.

(3) Descriptive notes and drawings of the surface features.

M. Luplau Janssen is a firm believer in determining the longitudes as well as the latitudes of Jovian markings with the micrometer, but some eye-estimated transits across the central meridian were also recorded. Many of the older observers of the planet will recollect the discussions which took place several years ago as to the relative merits of the two methods of deriving longitudes. A comparison of M. Luplau Janssen's micrometric results with central meridian transits by other observers shows the accuracy attained to be of much the same order, but it seems to the reviewer that in a given time a considerably larger number of spots can be observed by the transit method, which is a matter of great importance. On the other hand, valuable results can, of course, often be obtained with the micrometer of an object which has already been observed by the transit method, or for some other reason cannot be observed at its central passage. Micrometer measures also have the advantage of furnishing values for the equatorial as well as the polar diameter of the planet, and from his series of observations in 1919–20, M. Luplau Janssen deduces the figures 37″·72 and 35″·54 respectively at mean distance, which gives for the oblateness of the disc the value $\frac{1}{19}$. The figures for the equatorial and polar diameters at present adopted in the physical ephemerides are 37″·87 and 35″·35.

In the discussion of the observations of individual spots, the conclusions drawn suffer from the, relatively speaking, small number of longitude determinations. In fact, the identifications in some cases seem to the reviewer to be entirely erroneous. A striking example is found in the case of some remarkable spots observed in the south tropical zone (the zone between M. Luplau Janssen's bands IV. and V.). On p. 66 of his report five observations are taken together as referring to one and the same object, but if we accept the conclusions arrived at in the twenty-second report of the Jupiter Section of the British Astronomical Association recently published, which are based on a very much larger number of observations, we find that they actually belong to four separate objects, and that what is, perhaps, the most interesting fact revealed during the apparition—namely, the abnormal drift in opposite directions of two pairs of spots—has been entirely missed. Similarly, when all the available material is considered it appears that mistakes in the adopted identifications are accountable for some of the large irregularities of motion attributed to certain other spots by M. Luplau Janssen.

A valuable part of the report is that which contains a summary of the micrometrical measures of the latitudes of the belts and a comparison with results obtained by other observers in previous years. As has been often remarked, the latitudes of the belts show considerable variations, and especially has this been the case in recent years with the north edge of the north equatorial belt (M. Luplau Janssen's band III.). M. Luplau Janssen considers that there is evidence in the measures of some of the belts of changes of a periodic nature which are related to the position of the planet in its orbit. It may be questioned whether the available evidence is sufficiently strong to warrant such a conclusion, but the matter is certainly worth careful investigation, and there can be no doubt that measures of the positions of the belts (as emphasised several years ago by the late Prof. G. W. Hough) should be regarded as an important part of the work on Jupiter. M. Luplau Janssen lays emphasis on the stability in position of the south equatorial belt (his band IV.); yet it is worth noting that it is this belt which in 1919 and again in the present year has faded to such an extent as to become invisible save for its north component. Overlying vapours may perhaps be accountable for the effect observed, but on the other hand, in 1920 the revival was attended by disturbances which seemed to indicate some deep-seated cause in the planet's interior.

At the end of the report are seven plates containing 41 drawings, 37 of which belong to the apparition of 1919–20. These drawings illustrate the remarkably rapid and amazingly complicated changes which were associated with the great revival of the south equatorial belt and the south tropical disturbance during that apparition.

Taken as a whole, the report contains a mass of valuable data which will be very welcome to all students of the planet.

The Problem of Secretion.

THE attention of those who are interested in the problem of secretion is directed to a series of three papers by Dr. Robert H. Bowen, of Columbia University, New York, which have appeared in the current volume of the *Quarterly Journal of Microscopical Science* (vol. 70, parts 1, 2, and 3), and especially to the very capable critique of the topography, structure, and function of the Golgi apparatus in glandular tissue which he has given in a fourth paper (part 3, October 1926). Believing that the older theories of secretion had broken down and that the field was clear for the thorough examination of the Golgi apparatus as a synthetic intermediary in the process of secretion, he has concentrated his attention on this subject and has made only brief references to the secretory possibilities of other components of the cell.

Dr. Bowen concludes that the Golgi apparatus is present from the beginning in all kinds of secretory cells, and, when large numbers of secretory granules are being produced, becomes greatly hypertrophied, establishing a volume in rough relation to that of the secretory products, the other elements of the cell diminishing more and more. The topography and behaviour of the Golgi apparatus are different in different kinds of glands, but can be divided roughly into three general types characteristic of cells which produce serous, mucous, and lipoidal secretions. The secretory granules make their first appearance only within the area delimited by the Golgi apparatus. In a few cases there are indications that the secretory granules arise in close connexion with the Golgi material, and in fact that there is a constant and intimate topographical association between them. Dr. Bowen concludes that the secretory granules are differentiated by the Golgi material, but that no direct transformation of one into the other occurs, such as has been claimed by some authors who have advocated the mitochondrial origin of secretions. Dr. Bowen suggests that the Golgi material is structurally homologous throughout the range of animal cells, and that the so-called idiosomic substance sometimes associated with it is to be looked upon as one phase