W. P. Hiern's description of the dicotyledonous plants collected by Dr. Welwitsch, the first having been published at the end of 1896.

THE *Bibliotheca Geographica*, edited by Dr. Otto Baschin for the Berlin Geographical Society, is known to be a most complete annual and international bibliography of geographical literature. The sixth volume of this catalogue contains the titles of papers published during 1897, classified into the usual groups according to subjects, and with an authors' index. It is thus possible to find, without the slightest difficulty, what papers upon any particular district or branch of geography were published in 1897, or to look up the list of publications of any writer on geographical subjects. The volume contains 444 pages, and it does credit to the editor and the society under whose auspices it has been prepared.

THE additions to the Zoological Society's Gardens during the past week include a Lioness (*Felis leo*) from East Africa, presented by Major T. Soutar, Cameron Highlanders; a Sooty Mangabey (*Cercocebus fuliginosus*, ♂) from West Africa, presented by Major G. McMicking, commanding C.I.V. Field Battery; two Ostriches (*Struthio camelus*), a Nilotic Crocodile (*Crocodilus niloticus*) from East Africa, presented by Mr. G. Marsden; an Egyptian Jerboa (*Dipus aegyptius*) from North Africa, presented by Mrs. R. Gurney; a Barn Owl (*Strix flammea*), British, presented by Lady Hutt; a Leopardine Snake (*Coluber leopardinus*), a Tesselated Snake (*Tropidonotus tessellatus*), European, presented by Mr. W. J. Wintle; a Grey-cheeked Mangabey (*Cercocebus albigena*, ♂), a Sooty Mangabey (*Cercocebus fuliginosus*, ♀) from West Africa, a Moustache Tamarin (*Midas mystax*) from the Upper Amazons, a Yellowish Capuchin (*Cebus flavescens*) from South America, two Tenrecs (*Centetes ecaudatus*), a Short-nosed Tenrec (*Ericulus setosus*), a Long-nosed Tenrec (*Hemicentetes semispinosus*) from Madagascar, a Festive Amazon (*Chrysotis festiva*) from Guiana, two Tui Parrakeets (*Brotogerys tui*), a Hawk-headed Parrot (*Deroptyus accipitrinus*) from Brazil, deposited; two Grey Squirrels (*Sciurus griseus*, var.) from North America, purchased; a Bosch-bok (*Tragelaphus sylvaticus*, ♂), eight Moccasin Snakes (*Tropidonotus fasciatus*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

OBSERVATIONS OF THE INFRA-RED SPECTRUM OF THE SOLAR CORONA.—In a recent issue of the *Comptes rendus* (vol. cxxxi. pp. 658-661), M. Deslandres describes some of his latest experiments in connection with the detection of the solar corona at ordinary times without the intervention of an eclipse. All the methods adopted prior to 1894 had been modifications of spectroscopic examination, using either the visual or ultra-violet rays, and were probably unsuccessful owing to the great proportion of these radiations existing in our general sky illumination, thereby diluting the small direct coronal light. In 1894 M. Deslandres found evidence that the sky radiation was very poor in the infra-red region, while the corona emitted this light abundantly, and this has since been investigated by Prof. Hale, in 1895, without producing any confirmatory results. M. Deslandres here suggests, however, that this non-success may have been due to those experiments having been made near the period of maximum sun-spot activity, at which time the corona is much more uniformly distributed round the limb than at periods of minimum.

During the last eclipse, in May 1900, the author, in conjunction with M. Charbonneaux, found that the infra-red coronal radiation was some one-half or one-third the radiation of the same part of the sky after the eclipse, and the work has since been continued daily at the Observatory of Meudon with the same apparatus. This consists of a mirror 0·30 metre aperture and 1·50 metres focus, a slit spectroscope with crown lenses and prisms, a sensitive Melloni or Rubens thermopile, and a very sensitive Deprez d'Arsonval galvanometer. The slit of the spectroscope was 12 mm. long and 1 mm. wide, the prism train being so arranged that the thermopile only received the infra-red radiation from $\lambda 1^{\mu}$ to $\lambda 1^{\mu}\cdot 8$. The slit has also been replaced by circular apertures 0·4 mm. and 1 mm. diameter.

The interesting conclusion is that, at all times of the day, the sum of the deviations along the equatorial region has always been greater than the corresponding sum of the readings in a polar direction. As it is improbable that the diffuse heat of our atmosphere would be unequally distributed over the small area corresponding to the angular diameter of the sun, this difference can only be attributed to the effect of the corona; the present time being a minumum of spots, the greater action along the equatorial region is in agreement with the known conspicuous equatorial extensions of the coronal streamers and the comparatively small polar plumes. Many variations in the disposition of the apparatus have been made to discover any possible systematic errors, but the results have throughout remained the same.

In contrast with the above report should be considered the preliminary statement of the results obtained by the expedition organised by Prof. S. P. Langley from the Smithsonian Institution during the same eclipse (*Astrophysical Journal*, vol. xii. pp. 69-76). The light given from a 17 inch siderostat mirror passed to a concave speculum 50 cm. diameter and 1-metre focus. Arrangements were made whereby either the full image of a part of the solar surroundings could be allowed to fall on the bolometer strip, or the light previously passed through a prism, thus sifting out any particular radiation for action on the bolometer.

Settings on the inner corona gave a distinct *negative* deflection with respect to the zero of the instrument, but this was numerically less than the deflection given by a setting on the centre of the dark moon; this shows that the coronal radiations were recognised by the bolometer, giving some 5 mm. deflection greater than that of the dark moon.

The fact of the negative deflection, however, indicates that the radiation reflected by the earth's atmosphere during the partial phase is vastly more intense than that of the corona. Also "the corona is effectively cooler than the bolometer, and appears, therefore, neither to reflect much light from the sun, nor, chiefly by virtue of a high temperature, to give light of its own, but seems rather to be giving light in a manner *not associated with a high temperature*, or at least with the preponderance of infra-red rays usual in the spectra of hot bodies."

ANNUAL REPORT OF THE MELBOURNE OBSERVATORY.—In the thirty-fourth annual report of the Melbourne Observatory, Mr. P. Baracchi, the acting Government astronomer of Victoria, summarises the work accomplished at the institution during the period March 1, 1899, to March 31, 1900. With the 8-inch transit circle the total number of right ascension observations was 3311, and of north polar distance 2406. Of the latter, 1435 were on stars selected from the astrophotographic catalogue plates, to serve as fundamental stars for the reduction of these plates. 786 observations of heliometer stars were made at the request of Dr. Gill, and have been sent to him for comparison. The computations for the third Melbourne General Catalogue of 3100 stars are about two-thirds completed. The astrographic work has made considerable progress, the two series of catalogue plates and the series of chart plates with single exposure of one hour having been completed with the exception of a few scattered regions. Catalogue plates for regions above 80° of declination are being duplicated, and the second series of chart plates, with triple exposure of 30 minutes each, has been commenced, giving three images of each star about 8″ apart. The measurements of the catalogue plates taken at this observatory and the Sydney Observatory have been made at Melbourne, and the progress made is stated in a joint report by Messrs. H. C. Russell and P. Baracchi. The first twelve months of the existence of the measuring bureau (commencing November, 1898) were occupied in preliminary instrumental experiments and training of observers, but during the last four months systematic measurement has been carried on. Several new micrometers have been obtained, one by Repsold, similar to that used by Dr. Gill at the Cape. This has double slides, and thereby permits quicker measurements. At present two observers, relieving each other for alternate periods of one hour, measure in a day about 500 stars with the Repsold and about 400 with the local micrometer. As the total number of stars on the Sydney and Melbourne plates is probably 1,500,000, it is estimated that with three efficient measuring machines, and six observers employed from six to seven hours daily, the whole may be accomplished in some six or seven years. The photoheliograph, great telescope

and other equatorials have only been used on special occasions and for visitors, 594 of whom inspected the observatory during the year.

The automatic photographic registration of terrestrial magnetism was obtained with only 34 hours interruption during the year; absolute measurements were made on seven occasions, and instrumental constants, &c. determined.

The series of cloud photographs has been continued, 77 additional pairs of plates being taken from the roof of Parliament House and the observatory grounds respectively. These are now being measured and discussed in connection with visual observations.

ABNORMAL STARS IN CLUSTERS.—Prof. E. E. Barnard has for some time been engaged in micrometrical determinations of the positions of a number of the individual stars in the great globular clusters M 3, M 5, M 13, M 15, and M 92, and in the course of the work has noticed several peculiarities, the most striking of which is the fact that some of the stars in these clusters shine with a much *bluer* light than the majority of their neighbours, thus producing a remarkable difference between their photographic and visual magnitudes. So striking is this that the images in some cases are so large as to suggest variability (*Astrophysical Journal*, vol. xii., pp. 176—181). Comparisons have been made with a negative enlarged four times from an original of M 13 Herculis, taken with the Potsdam 13-inch photographic refractor in 1891.

The two stars, Nos. 148 and 131 of Scheiner's catalogue of this cluster are practically equally bright to the eye as seen in the sky; but on the photograph No. 148 has an image four or five times larger than No. 131.

Other neighbouring stars, however, register photographically the same relative brightness as determined visually. This led to the minute examination of No. 148 with high magnifying power, when it gave the impression of some object less sharp than stars near it, suggesting the idea of a small planetary nebula. Other stars showing the same abnormal features are detailed, and a numbered sketch of a portion of the cluster given for identification.

Prof. Barnard says he has found similar cases in other clusters, *e.g.* M 5 Libræ. A suggestion by Prof. Hale that a photograph taken through a yellow screen should not show these peculiarities was tested on the 40-inch Yerkes refractor and proved correct, the stars previously mentioned coming out on the photograph with almost the identical relative brightness they show visually in the same telescope.

The suggestion is made that these stars are of similar nature to the condensation or nucleus of the annular nebula in Lyra, perhaps bearing the same relation to the other stars of the cluster that the nucleus of that nebula does to the ordinary stars of the sky. It would appear, therefore, that the possibility of these abnormal stars being of the nature of nebulæ brings up again the question of nebulosity in the globular clusters.

RECENT STUDIES OF INFRA-RED REGION OF SOLAR SPECTRUM.—In the current issue of the *Comptes rendus* (vol. cxxxi. pp. 734-736), Prof. S. P. Langley describes the result of his recent work on the bolometric study of the solar spectrum in the infra-red. At the date of his last communication to the French Academy, in 1894, the knowledge of the region beyond $\lambda = 1\mu$ was very imperfect, but now, thanks to the great improvement of his bolometer, which is capable of detecting a variation of temperature as minute as the millionth part of a degree, the map of the calorific rays has been carried to $\lambda = 5{\cdot}8\mu$. The article is illustrated by a heliogravure of the calorific spectrum from $\lambda = 0{\cdot}76\mu$ to $\lambda = 5{\cdot}3\mu$, both the galvanometer record and the "line" integration being given. More than 600 lines are recorded, each of which has been studied separately and obtained by from six to twenty independent observations. Prof. Langley calls special attention to the observations of the *telluric* infra-red spectra, which have been studied during all seasons from 1895-1900. Systematic variations have been observed in them which appear to have some relation to the season in which they occur, and, although small, are very distinct.

THE ZODIACAL LIGHT.—*The Observatory* for November contains the first part of an article giving in a concise form the complete history of the zodiacal light. In this number the history is brought up to the year 1855, being derived mainly from two sources; (1) the article by M. E. Lefébure in *Ciel et Terre*, April, 1894; (2) a Review by Prof. C. E. Brame in the *Popular Science Monthly*, October, 1877.

THE NAPLES ZOOLOGICAL STATION.[1]

THE Zoological Station at Naples is so well known, either by personal experience or by repute, to zoologists the world over, that it may seem to some that any further account of it is quite unnecessary. But the institution has lately extended its scope and increased its equipment so as to appeal to workers in other lines of biology; and, moreover, as certain Associations and Universities in this country and elsewhere give annual grants towards defraying the expenses of special researches at Naples, it is due to scientific men in general that they should be kept informed from time to time of the conditions under which such work is carried on.

About ten years ago the then chairman of the British Association Naples Committee visited Naples, and gave an interesting report (NATURE, February 1891, p. 392) on the condition of the Zoological Station, in which he dwelt mainly upon the history, constitution, finance and publications; it will, therefore, be best that I should now draw attention, chiefly to the present facilities for work at this world-renowned laboratory, and to the additions and improvements effected during the last decade. I am indebted to Prof. Dr. Anton Dohrn, the director, and to the secretary, Mr. Linden, for much information given me during my recent visit.

Since Dr. Sclater's visit in 1890 additional accommodation has been obtained by a re-arrangement of the roof of the main building. This gives space for a second laboratory, a supplementary library, and various smaller rooms used as chemical and physiological laboratories, for photography and bacteriology. A good deal of the research in recent years, both on the part of those occupying tables and of the permanent staff, has been in the direction of comparative physiology, experimental embryology, and the bacteriology of sea-water, and all necessary facilities for such work are now provided.

The number of work-places, in some cases separate rooms, known technically as "tables," is about fifty-five, and of these about thirty-four are rented annually by States, Universities, or Associations. Germany takes about ten of these, and Italy seven. There are three American tables, and three English (rented by the Universities of Cambridge and Oxford and the British Association respectively); consequently there are generally about half a dozen English and American biologists at work in the station; but Dr. Dohrn interprets in a most liberal spirit the rules as to the occupancy of a table, and, as a matter of fact, during my recent visit there were, for a short time, no less than three of us occupying simultaneously the British Association "table," and provided with separate rooms.

A work-table is really a small laboratory fitted up with all that is necessary for ordinary biological research, and additional apparatus and reagents can be obtained as required. The investigator is supposed to bring his own microscope and dissecting instruments, but is supplied with alcohol, acids, stains, and other chemicals, glass dishes and bottles of various kinds and sizes, drawing materials and mounting reagents. Requisition forms are placed beside the worker on which to notify his wishes in regard to material or reagents, he is visited at frequent intervals by members of the staff, and all wants are supplied in the most perfect manner. The recent addition of carefully planned filter-beds, by means of which half the sea-water in circulation in the tanks can be filtered and separated from the rest, has materially increased the facilities for some classes of experimental work.

The staff of the station consists of:—

(1) Dr. Anton Dohrn, the founder and director.

(2) Seven or eight scientific assistants—viz. Dr. Eisig, administrator of the laboratories; Dr. Paul Mayer, editor of the publications; Dr. Giesbrecht, assistant editor and supervisor of plates; Dr. Gast, assistant editor and supervisor of microscopic drawings; Dr. Schöbel, librarian; Dr. Lo Bianco, administrator of fisheries and préparateur; Dr. Hollandt, temporarily in charge of the microscopic sections department—all of them well-known men, each eminent in his own line of investigation. The post of assistant in the physiological department, formerly held by the late Dr. Schoenlein, is now vacant.

(3) In addition to the foregoing there are:—The secretary, Mr. Linden; two artists and the engineer.

(4) Also about thirty attendants, collectors and others em-

[1] Abridged from the "Note by the Chairman" of the Naples Committee in the report presented to the British Association at Bradford, September 1900.