

diagrams. Until the book is completed it would be impossible to form an opinion of its value, but the first part promises well.

THE annual report of the board of regents of the Smithsonian Institution for the year ending June 30, 1904, has now been published. As usual, the general appendix to the report, which makes up about seven-eighths of the volume of 804 pages, will prove most interesting to British readers. This appendix contains more than fifty articles upon scientific subjects to which special attention was directed during the year with which the report deals. Five of the articles represent addresses at the congress of arts and sciences held at St. Louis during September, 1904. Among these may be noticed that of Prof. H. H. Turner, F.R.S., on some reflections suggested by the application of photography to astronomical research; Mr. C. T. R. Wilson, F.R.S., on condensation nuclei; and Sir William Ramsay, K.C.B., F.R.S., on the present problems of inorganic chemistry. Two addresses delivered at the Cambridge meeting of the British Association are also reprinted. A generous selection of articles from important American, French, German, and British scientific publications is included, and nearly every department of scientific knowledge is represented. There are several articles which appear to have been contributed specially to this report, and of these may be mentioned the essays of Dr. S. P. Langley on experiments with the Langley aërodrome (see p. 645), Dr. J. O. Skinner on the house sparrow, Dr. Theodore Gill on flying fish and their habits, Mr. Edgar L. Hewett on a general view of the archæology of the Pueblo region, Dr. Alés Hrdlička on the painting of human bones among the American aborigines, and Mr. W. C. Gorgas on the sanitation of the Isthmian Canal zone. The profusion and excellence of the plates and other illustrations again call for remark. Readers who are fortunate enough to have access to these yearly reports are provided with an excellent means of keeping abreast of current scientific studies.

#### OUR ASTRONOMICAL COLUMN.

ITALIAN OBSERVATIONS OF THE RECENT SOLAR ECLIPSE.—A series of valuable observations of the partial eclipse of the sun was made at Aosta (Italy) on August 30, and the results are given in No. 17 (1905) of the *Comptes rendus*.

The times of contacts, the meteorological changes, and the spectroscopic phenomena were observed in an atmosphere of exceptional purity, and, in connection with the last named, Dom Cl. Rozet describes what he believes to be a unique observation. At about 1h. 40m. (Paris M.T.) the cusp of the crescent sun (position angle about 90°) was projected on to the widened slit of the spectroscope, arranged perpendicular to the solar limb, and the lines C and D<sub>3</sub> were seen very bright and showing a hazy, cloud-like prominence.

The bright line in each case, however, was divided sharply into three parts. First, on the red side was a broad bright line with sharp edges, then came a narrow, well defined dark line, and finally, on the more refrangible edge, a bright line showing the form of the prominence was seen.

MARTIAN METEOROLOGY.—In No. 8, vol. liii., of the *Harvard College Observatory Annals*, Prof. W. H. Pickering discusses a number of photographs of Mars some of which were taken with the 13-inch Boyden telescope at Cambridge (Mass.) in 1888, and the others at Mt. Wilson, with the same instrument, in 1890. Although these photographs do not show the canals and lakes, they show sufficient variation, due to meteorological changes, for a discussion of Martian meteorology.

Prof. Pickering describes, in order, the appearance and

disappearance of clouds, snow, &c., and deduces therefrom some valuable suggestions as to the seasonal changes which take place on or above the planet's surface, giving, in each case, the equivalent terrestrial date at which these changes occur. Nine reproductions from the original photographs, on a scale of 1 mm. = 200 km., accompany the paper, and show the clouds, &c., to which Prof. Pickering refers; the Sinus Sabæus and the Syrtis Major are also shown on some of them. On two occasions the height of the clouds above the Martian surface was measured, giving about 15 miles as the result, and Prof. Pickering suggests that the existence or non-existence of such clouds in the equatorial regions may account for the discrepancies noted between various estimations of the amount of the polar flattening.

In conclusion, Prof. Pickering points out that there is now direct evidence of an effective atmospheric circulation of moisture on Mars which would seem to account, adequately, for the observed transfer of precipitation, during the Martian year, alternately from pole to pole.

A 300-YEAR CYCLE IN SOLAR PHENOMENA.—From a lengthy discussion which appears in No. 1, vol. xxii., of the *Astrophysical Journal*, Mr. H. W. Clough, of the Washington Weather Bureau, arrives at the conclusion that a 300-year cycle exists in solar, and the allied terrestrial, phenomena. In the first place, Mr. Clough discusses the observations of numerous terrestrial phenomena which are supposed to be dependently associated with solar changes, and finds that a 36-year cycle is common to these and to solar variations. He then shows that the 36-year cycle varies in length during a cycle of 300 years, and supports this by reference to old observations of various terrestrial phenomena, e.g. auroræ, time of grape harvest, &c., extending back to the early centuries of the Christian era.

SOME SUGGESTIONS ON THE NEBULAR HYPOTHESIS.—In a paper communicated to the Royal Society of Edinburgh, and published in part vii., vol. xxv., of the *Proceedings* of the society, Dr. Halm makes some suggestions, concerning the probable genesis of the solar system, which may overcome some of the difficulties experienced in the acceptance of Laplace's theory. Whilst the Laplaceian hypothesis considers that the matter now forming the planets was thrown off by the original rotating nebulous mass, a consideration which is not consistent with the principle of the constancy of the rotary momentum in a system, Dr. Halm suggests that the conditions necessary for the formation of planets were not introduced until after the solar body had condensed from a non-rotating nebula into a spherical body having a diameter probably less than the distance of Mercury. This spherical body then encountered a swarm of meteorites, and finally a ring of these bodies, rotating with orbital velocities about the solar nucleus, was formed.

The planets were formed subsequently by the evacuation of the ring by the larger nuclei existing therein, their rotary motions being generated by the tangential impulses given to each nucleus by the smaller masses falling into it. Many subsidiary considerations are discussed in Dr. Halm's paper, but they are too lengthy to be given here.

SYSTEMATIC ERROR IN TRANSIT OBSERVATIONS OF JOVIAN SPOTS.—We recently referred in these columns (September 21) to a suggestion made by the Rev. T. E. R. Phillips to account for a systematic error in eye-estimates of the transits of Jupiter's spots, and, in the current number of the *Observatory*, Mr. Stanley Williams supplements Mr. Phillips's remarks with a brief discussion of his own results, in which a similar, but larger, systematic error seems to exist. Mr. Williams suggests that the phase-darkening of any long feature such as the red spot, or hollow, may introduce the error. For example, at the quadrature preceding opposition the planet's disc for some distance from the preceding limb is less bright than it is near to the following limb, but at the quadrature following opposition the reverse is the case. As the spot and the hollow are so long, the transit is observed, in practice, by comparing the relative spaces between their ends and the limb, and if the latter are unequally bright, irradiation may lead to such a systematic error as the one which appears in the results.

THE ORBIT OF  $\sigma$  CORONÆ BOREALIS.—As the orbits calculated from the observations of  $\sigma$  Coronæ Borealis show great divergence, ranging from 200 to 800 years, Prof. Doberck has investigated this subject, and now publishes the results in No. 4051 of the *Astronomische Nachrichten*. The set of elements which he gives depends upon Herschel's measures of the angle, and shows the period to be about 1679 years, and the motion to be direct.

Prof. Doberck states that the hypothetical parallax of this system is  $0^{\circ}.064$ , but the actual parallax is probably smaller, and that the mass of the system is probably greater than that of the sun.

RADIAL VELOCITIES OF CERTAIN VARIABLE STARS.—The results obtained by Prof. Frost from a series of spectrographic observations of certain variable stars (chiefly of the Algol type) are given in No. 3, vol. xxii., of the *Astrophysical Journal*.

R Canis Majoris, Z Herculis, and U Sagittæ are shown with certainty to be spectroscopic binaries, their determined velocities corresponding, in sense, to what would be expected from the phase in the light variation at the time of observation.

VARIABILITY OF THE ASTEROID (444) GYPTIS.—The variability of the apparent brightness of the minor planet (444) Gypsis is suggested by the results obtained from a series of observations made at Heidelberg and published by Dr. W. Valentiner in No. 4050 of the *Astronomische Nachrichten*.

In the same journal it is suggested, by Dr. Palisa, that the magnitude of minor planet 1905 RB is also variable.

#### CONFERENCE OF DELEGATES OF LOCAL SCIENTIFIC SOCIETIES.

AS it was not deemed expedient to call a meeting of the delegates of the corresponding societies of the British Association during the session in South Africa, it was arranged that a special conference should be convened subsequently in London. This meeting was held at the rooms of the Linnean Society on Monday and Tuesday (October 30 and 31), and was largely attended by representatives of various scientific societies in England, Scotland, and Ireland.

Dr. A. Smith Woodward, who presided at the conference, delivered an inaugural address rich in sympathy with the efforts of the provincial societies to further the progress of science, yet not without a word of gentle reproof to such societies as give undue prominence to the picnic element, which rather tends to the estrangement of the working naturalist. Probably the best work of the smaller societies was, in the chairman's opinion, that of instruction in the current progress of science. He suggested that it would be salutary to dwell on the unsolved problems of science, and pointed out the need of books which should treat of our ignorance rather than our knowledge, and so indicate the direction in which investigation is still urgently needed. Dr. Woodward condemned as extremely unfair the growing practice of certain societies to solicit men of scientific renown to deliver popular lectures without fee. Warm approval was expressed of the recent action of the British Association in seeking to extend its usefulness by including within its union the smaller non-publishing societies and field clubs, which will form henceforth a new class of *associated* societies distinct from the group of *affiliated* societies which publish original investigations in science.

Dr. W. Martin, of the Temple, introduced a discussion on the law of treasure trove, with the view of inducing the various local societies to assist in the preservation of antiquities found within their sphere of influence. While generally defending the law he advocated some revision, especially in the mode of its administration. He suggested that notices should be widely circulated, say at the post-offices throughout the country, explaining to the public that the finder of valuable relics would receive reasonable remuneration. In a similar way, relics like stone implements might be secured, where desirable, by the State.

Mr. Morris Colles, the director of the Authors' Syndicate, and Mr. Harold Hardy explained the present law of copyright as it affects the published proceedings of

scientific societies. The general sentiment of the meeting seemed, however, to be in favour, not of hindering in any way the re-publication of papers, but rather of encouraging the dissemination of knowledge by favouring publication, naturally with due acknowledgment of the original source of information.

Prof. G. S. Boulger read an interesting paper on the preservation of our native plants, which led to a valuable discussion. There seems no doubt that some of the rarer indigenous plants are in serious danger of extermination, not wholly through thoughtlessness on the part of the public, but partly through the cupidity of botanists—an evil which has increased since the extension of nature-study. It was proposed that legislation should ultimately be sought for the protection of certain plants, but that meanwhile a circular should be issued bringing the subject before teachers, members of field clubs, and others interested in our flora and likely to assist in its conservation.

In addition to attending the two meetings, the delegates visited the Museum of the Royal College of Surgeons under Prof. Stewart, and, on the evening of October 30, dined at the Royal Societies Club, where they were received as guests.

#### ZOOLOGY AT THE BRITISH ASSOCIATION.

THE work of Section D was formally opened on Wednesday, August 16, with the president's address on "The Distribution of African Fresh-water Fishes," which has already been printed in *NATURE* (August 24, p. 413). This was followed by a paper by Mr. L. Doncaster entitled "Recent Work on Gametogenesis and its bearing on Theories of Heredity," which took the form of a *résumé* of the most important recent work on the relation between the phenomena of nuclear division and those of heredity. It was shown that whilst ample confirmation had been obtained of Weismann's hypothesis that the chromosomes are the bearers of inherited characters, yet the most recent work on the maturation of the germ cells had demonstrated the fact that they contained a mechanism which seemed precisely adapted to bring about that segregation of characters which forms the most fundamental part of the Mendelian theory; it was difficult, therefore, to believe that the two things were unconnected. The remainder of the paper was devoted to the consideration of certain obvious difficulties standing in the way of a complete correlation.

The programme for Thursday, August 17, was opened by Dr. J. D. F. Gilchrist with a paper on cases of extensive mortality among marine animals on the South African coast, with suggestions as to their cause or causes. After narrating specific cases of enormous quantities of fish either dead, or alive but "in a stiffened condition," being thrown up on various points of the coast, the author suggested that these occurrences might be due to a peculiar feature of the Cape seas, viz. the great difference in temperature, salinity, and contents of the warm Agulhas Stream of the Antarctic drift current, and expressed the hope that his notes might be of some use in directing attention to this problem and securing additional evidence in connection therewith. The paper was followed by a demonstration of the more interesting forms in a collection of deep-sea animals shown in the museum of the South African College, special attention being devoted to certain questions, such as methods of reproduction of deep-sea fish, the significance of luminous organs, and parasitism. A short paper by Mr. A. H. Evans on the ostrich and its allies was intended to be introductory to a contribution on ostrich-farming by the Hon. Arthur Douglass, one of the pioneers of the industry in the colony. In the latter paper the writer supplied a large amount of interesting information relating to the first commencement of ostrich farming in 1867 and its growth up to the present time, the best climatic and general conditions for the industry, the results of artificial hatching as used in the early days of the industry as compared with present methods of rearing the chicks, the principal diseases of the birds, the present different methods of farming them, the growth of the export of feathers and the range of values, the improvement of the breeds by selection to obtain better feathers,