

months. This is all the more notable when we observe that Dr. Chamberlain's name appears on both title pages.

In the 'Morphology of Spermatophytes' we have Part I. of what is evidently to be a work of considerably larger proportions, the present volume being fragmentary, dealing with the Gymnosperms only, and closing somewhat abruptly, even wanting an index. The preface was evidently written for the complete work, and this fact suggests the intention of the authors to bring out Part II. at no distant day. The part before us takes up stem, leaf, root, microsporangium, megasporangium, female gametophyte, male gametophyte, fertilization, and the embryo, for Cycadales, Ginkgoales, Coniferales, and Gnetales, devotes a few pages to fossil Gymnosperms (Cordaiales, Bennettitales, Cycadales, Ginkgoales, and Coniferales), and a few more to the phylogeny, and geographic distribution of the various orders mentioned above. The volume closes with a most useful bibliography of one hundred and ten titles. More than one hundred excellent illustrations (largely original, and often from photographs) add materially to the usefulness of the work.

This book must prove very helpful to the student who is working along morphological lines, and will tend to bring him back to strictly scientific work, in case he has been wandering through the fogs of so-called 'elementary ecology.' A valuable feature of the book is the citation and discussion of the different views held by botanists as to the morphology of particular structures. While the conclusions reached are not always those which we can approve, the treatment is such that the student is led to look on all sides of every problem before a decision is reached. We can not accept the authors' views as to the morphology of the structure supporting the ovules of *Ginkgo* (which we hold to be foliar instead of axial), nor that of the 'ovuliferous scale' of the *Abietinæ* (which we interpret as an enlargement and extension of ovular tissue; *i. e.*, it is ovular instead of axial or foliar in nature).

Dr. Chamberlain's book must prove useful in histological work in botanical laboratories in high schools and colleges. The plan of the

work includes two parts, in the first of which are ten short chapters on apparatus, reagents, the making of mounts, killing and fixing agents, staining and the celloidin and glycerine methods. The author's success as an investigator and teacher is a guarantee of the value of the suggestions made in these chapters. The second part is mainly a series of selected examples of algæ, fungi, bryophytes, pteridophytes, and spermatophytes, in which the preceding suggestions are applied. This portion of the book is an admirable introduction to the vegetable kingdom, and must commend the volume to teachers and students. The book closes with a handy chapter of formulæ of reagents, and a good index.

These works are creditable to the university from which they appear, and deserve to be widely used.

CHARLES E. BESSEY.

SCIENTIFIC JOURNALS AND ARTICLES.

No. LIII. of the *Journal of American Folk-Lore* begins with a paper by Dr. J. W. Fewkes, in which he explains and interprets the Katcina worship of the Hopi or Moki of Arizona. The word is used to denote a masked personage, who, in a ceremonial dance, represents a divine being. Dr. Fewkes shows that these beings are spirits of clan ancestors, who are supposed to return from their dwelling in the underworld. Thus in mortuary prayers, the dying are addressed as about to become Katcinas, and are implored to send rain. Of the Katcinas, some are eponyms of Hopi clans; others are imported from abroad, or are imaginary creations. Chief of these spirits are the Sun Father and Earth Mother, parents of all clans. With sun worship also are connected some of the festivals; in the two great feasts of the Katcina clan are dramatized the arrival and departure of the Katcinas, who are supposed to leave the pueblo in July and return in February. They are said to go to the San Francisco mountains; but the underlying idea is that they enter the underworld through the gate of the Sun-house, the situation of which is indicated by a notch in these mountains, being the place of sunset at the time of the winter solstice. In the dramatic action held in the

sacred room or kiva, the Sun is personated by a man disguised as an eagle, whose performances symbolize the fertilization of the earth. In his most curious and interesting article, Dr. Fewkes makes it clear that the original significance of the ceremonies has long been forgotten by the Hopi. The editor, in treating of Kootenay medicine-men, makes clear the manner in which Christian ideas have intertwined themselves with Indian beliefs; he is of opinion that the Nootka god Kātse, whose name is kept secret, save that the dying chief communicates it to his grandchild, with instructions as to the manner of praying to this being, is none other than Jesus Christ. Miss A. C. Fletcher informs us that admonitions urging industry formed a part of Indian traditional teaching. Professor Rodney H. True discusses the relation of folk materia medica to modern knowledge. The 'Record of American Folk-Lore' is as full and instructive as usual. Altogether the new editor, Dr. A. F. Chamberlain, may congratulate himself on the presentation of a valuable number.

The American Naturalist for July opens with the second instalment of William M. Wheeler's paper on 'The Compound and Mixed Nests of American Ants,' this part being devoted to the known cases of social symbiosis among American species. Professor Wheeler gives Wasmann's table of the varied conditions under which symbiosis may occur, and then presents a scheme showing a more exact and natural grouping of the cases, to each of which an appropriate name is given. Under each of these headings the various species are treated in considerable detail; the article is of considerable length and much interest. R. W. Shufeldt presents a paper 'On the Osteology and Systematic Position of the Alcæ,' considering that the auks constitute a suborder standing between the gulls and petrels. A. W. Peters describes 'Some Methods for Use in the Study of the Infusoria' and 'Outram Bangs' gives some 'Notes on a Small Collection of Mammals from the Liu Kiu Islands' including the description of a new bat, *Hipposideros turpis*. C. W. Prentiss describes in detail an interesting 'Case of Incomplete Duplication of Parts and Apparent

Regulation in *Nereis virens* Sars.' The fourteenth instalment of the 'Synopsis of North American Invertebrates' contains the Hydro-medusæ, Part III., by Charles W. Hargitt. Like the others of this valuable series, this comprises full keys to the families and genera, but it also has descriptions of the species. This number of the *Naturalist* contains the 'Quarterly Record of Gifts, Appointments, Retirements and Deaths.' The total amount of gifts reaches well into the millions, largely through the sums given by Andrew Carnegie to found libraries.

The Popular Science Monthly for August has as its frontispiece a portrait of Dr. Ira Remsen, the recently elected President of Johns Hopkins University. The first article, by J. J. Thomson, is 'On Bodies Smaller than Atoms.' Brother Potamian gives a sketch of 'Gilbert of Colchester,' the author of 'De Magnete,' showing his numerous discoveries in magnetism, and we have Part II. of 'The Peopling of the Philippines,' by Rud. Virchow. R. M. Wenley discusses 'Science and Philosophy,' noting the estrangement that seems to exist between the two and calling for harmony between them. The ninth part of 'A Study of British Genius,' by Havelock Ellis, is devoted to personal characteristics, and William James treats of 'Frederic Myers's Service to Psychology.' 'The Pose of the Body as Related to the Type of the Cranium and the Direction of the Visual Plane' is the subject of a paper by George T. Stevens, the writer considering that many benefits and ills depend upon the direction of the visual axis, and that when these are so directed as to be injurious they can be rectified. The final article on 'The Great Mortality,' by Edward P. Cheyney, is a description of the 'Black Death,' now known as the bubonic plague, which devastated Europe in the fourteenth century.

Bird Lore for July-August, opens with 'First Impressions of Hawaiian Birds,' by H. W. Henshaw, an article which rather impresses the reader with the comparative scarcity of bird life and the difficulties in observing it. Frank M. Chapman contributes 'A Nighthawk Incident,' with some excellent illustrations, after photographs of the bird, and Verdi Burtch de-

scribes 'The Birds of a Marsh' near Keuka Lake, N. Y. The 'fifth series of 'Birds and Seasons' is devoted to the birds to be seen and studied in August and September, as noted by contributors from Boston to Stockton, Cal., with suggestions for the season's study and reading.

THE first number of *The Museums' Journal* of Great Britain is issued promptly, and naturally commences with a statement of the objects of the Museums' Association and its journal. The address of the President, Sir William Turner, delivered at the Edinburgh meeting of the Association follows, and this is devoted to the history of 'The Public Museums of Edinburgh.' A sample is submitted of 'A Museum Label,' descriptive of British pottery and as criticism is invited it may be said that it will strike some as rather long, although it is undeniably replete with information. 'Museum Notes,' 'At Home and Abroad,' complete the number.

IN the issue of SCIENCE for April 26, 1901, there was given a somewhat detailed account of a proposed journal for the statistical study of biological problems, suggested by Professor Karl Pearson and Professor E. F. R. Weldon. We are glad to learn that the first number of the journal, which is called *Biometrika*, will be published in October. Professor C. B. Davenport, of the University of Chicago, is one of the editors, the others being Professors Pearson and Weldon. The journal will be published by the Cambridge University Press and will appear about four times a year. The following papers are ready or in preparation :-

'Biometry': FRANCIS GALTON.

'On the Terminology and Notation of Biometric Investigations.'

'Variationsstatistische Probleme und Materialien': Professor Dr. F. LUDWIG.

'Criminal Anthropometry and the Identification of Criminals': Dr. W. R. MACDONELL.

'Critical Bibliography of Statistical Memoirs. I. Heredity': Professor W. F. R. WELDON.

'Anthropometric Data from Australia': W. POWYS.

'Variations in *Synapta inhærens*': Professor C. L. EDWARDS.

'Homotyposis in the Egg of the House-Sparrow': Dr. A. LEE and Professor K. PEARSON.

'The Cuckoo's Egg': OSWALD LATTER.

'Variation in *Aurelia*': E. T. BROWNE.

'Inheritance of the Duration of Life and the Intensity of Natural Selection in Man': Miss M. BEETON and Professor K. PEARSON.

'Artificial Selection, being a Comparison of the Distributions of Conscripts and Recruits in various Italian Provinces': Professor W. F. R. WELDON.

'Results of Cooperative Investigation on the Laws of Inheritance in Plants. I. The Shirley Poppy.'

'Variation and Correlation of the parts of the Human Skull. A Quantitative Study of the Naqada Crania': Miss C. D. FAWCETT.

'Extended and Improved Tables of Probability Integrals': W. F. SHEPPARD.

'Variation in the Form of the Helix of the Shell in *Clausilia laminata* (Montagu)': Professor W. F. R. WELDON.

'Mathematical Contributions to the Theory of Evolution. XI. The Influence of Natural Selection on the Variability and Correlation of Characters': Professor K. PEARSON.

'On a Physico-statistical Theory of Heredity': G. U. YULE.

'A Statistical Study of the Wild Bee': Professor F. Y. EDGEWORTH.

AN Index to the *Experiment Station Record*, covering the first twelve volumes, and containing more than one hundred thousand entries, has been prepared and will probably be published in the autumn.

THE Senate of the University of London has decided to publish periodically an official organ, to be called *The London University Gazette*, which will contain class lists, new regulations, dates of examinations, etc. The paper will appear about twenty times in the first year, beginning in October.

DISCUSSION AND CORRESPONDENCE.

THE VISUAL PERCEPTION OF SPACE.

THE fact to which Professor Thorndike called attention in the last number of SCIENCE must appear extraordinary to those who have not