waters that produce a broader counter current north than south of the equator in the Indian ocean, that limit the south counter of the Pacific to the western part of that ocean, and that exclude a south counter current entirely from the Atlantic.

W. M. Davis.

Harvard University.

CURRENT NOTES ON METEOROLOGY.

THE CLIMATOLOGY OF MARYLAND.

A second edition of the Climatology of Maryland, originally published in 1894, has been issued as the *Second Biennial Report of the Maryland State Weather Service.* The data used in this compilation are the observations of the years 1892 to 1895, inclusive, and five charts accompany the report, showing the mean seasonal and mean annual precipitation and temperature. The Maryland Weather Service, organized in 1891, under the joint auspices of the Johns Hopkins University, the Maryland Agricultural College and the U. S. Weather Bureau—a very happy combination of elements— deserves great credit for the work it is doing for meteorology in the United States.

METEOROLOGICAL OBSERVATIONS IN SCHOOLS.

The Connecticut State Board of Education has issued a pamphlet on *Meteorological Observations in Schools* (Conn. School Doc. No. 10, 1896), which is intended to serve as an outline for the use of teachers who wish to give their scholars some practice in taking systematic meteorological observations of the simplest character. The time has come when some beginning in the teaching of meteorology in our schools should be made, and in order that such instruction may be systematic, and may serve as a basis for more advanced work in the later school years, an outline such as the present one is necessary. Teachers who are giving any attention to meteorology will find the pamphlet useful.

OTHER NOTEWORTHY PUBLICATIONS.

The following recent publications are worthy of note:

H. C. Russell: *A Map Showing the Average Monthly Rainfall in New South Wales.* (Read before the Royal Society of New South Wales, November 7, 1894.) The map shows, for each square degree of the Colony, the mean rainfall for every month.

Süring und Berson: *Die XV. Fahrt des Ballons 'Phönix' am 1 July, 1894.* (Zeitschr. f. Luftschiffahrt, February–March, 1896, 29–53.) An account of a balloon ascent to an altitude of 17,226 feet. Full meteorological observations were taken.

R. De C. Ward.

Harvard University.

SCIENTIFIC NOTES AND NEWS.

ASTRONOMY.

The Saxon Academy has recently published a paper by Dr. Bruno Peter, containing the results of his observations with the new Repsold heliometer of the Leipzig observatory. The paper contains an extensive investigation of the instrument and a determination of the parallaxes of three stars whose parallaxes had not previously been measured. The most interesting thing brought out in the investigation of the instrument is an experimental verification of the possibility of eliminating entirely the effects of a varying focal adjustment of the eye-piece by the use of certain peculiarly shaped diaphragms in front of the object glass. That this is possible had been previously suggested from theoretical considerations by Dr. Abbe, of Jena. The only point in which Dr. Peter's method of observation differs materially from that usually employed is in the determination of the error of runs separately for each observation, instead of employing a constant value for the night.

The parallax observations have been effected very nearly according to the program used by Gill. The results obtained are as follows:

	Parallax.	
Bradley 3077,	+0″.13	±0″.012
Arg.-Oeltz. 10603,	+0″.17	±0″.013
31 Aquilæ,	+0″.06	±0″.015

It is to be regretted that Dr. Peter has not yet published the results of his observations of other stars. One would have supposed that the first publication of observations made with a new instrument would include the results obtained for stars observed elsewhere. Thus a comparison with the work of other observers would have furnished a certain check upon Dr. Peter's own work. The stars whose parallaxes have been observed by Dr. Peter, but still remain unpublished, are:

Eta Cassiopeiæ,	Theta Ursae Majoris.
Mu Cassiopeiæ,	Beta Coma Berenicis.
Lal. 15290,	Lal. 18115.

THE *Astronomical Journal* of June 4th contains a determination, by Mr. Eric Doolittle, of the secular perturbations of Mercury by the Earth. The computations were made according to the method of Gauss. There is also an orbit of Gamma Coronae Borealis by Dr. See. Prof. Comstock calls attention to the fact that his observations for the determination of the constant of aberration by Loewy's method show evidence of the existence of systematic error depending on magnitude in the observation of the right ascensions of the fundamental stars with the meridian circle. H. J.

HONEY ANTS.

AN interesting paper by Mr. W. W. Froggatt, of the Australian Museum, on Australian honey ants, has just been reprinted from the 'Report of the Horn Expedition to Central Australia; Part II., Zoölogy.'

Camponotus inflatus, Lubbock, has long been known (since 1880) to possess an inflated form of worker which the other ants in the colony use as store houses for the preservation of saccharine substance, just as is the case with the honey ants of Mexico, Colorado and Sarawak. The present paper describes two new species, *Camponotus cowlei* and *C. midas*, both congeneric with Lubbock's species and both possessing the honey-storing habit, though in less marked degree than *C. inflatus*. In fact, *C. cowlei* seems to be, to a certain extent, a transition form, or a form in which the differentiation into the honey-bearing workers has not proceeded to its fullest extent. Even in *C. inflatus* there is little or no structural difference between the honey-bearing workers and the ordinary worker, but the honey bearers are quite incapable of movement and must be fed by the ordinary workers. With *C. cowlei*, however, the honey bearers, although considerably swollen, seem to be able to move about slowly. It is possible that the only colony observed was a young colony and that the 'rotund' had not reached its full individual development. There is no hint by the writer that with the Camponotus honey ants there is any tendency towards the change to honey bearers on the part of certain of the workers by reason of any peculiar structure or form of intestine or abdominal walls, as has been suggested by Dr. McCook in the case of our Colorado Myrmecocystus. The development of this extraordinary habit in certain species which are perfectly congeneric with many other species in other parts of the world in which there is no tendency in this direction is not the least interesting phenomenon connected with this extraordinary subject. L. O. H.

SCIENTIFIC CONTRIBUTIONS FROM THE MISSOURI BOTANICAL GARDEN.

*The American Walnuts and Hickories.** The present paper, which in the main accepts the specific limitations and nomenclature of Prof. Sargent's Silva of North America, is devoted mainly to an analysis of the characters by which the hickories and walnuts and butternut may be distinguished in their winter condition, it being claimed that the characters afforded during that season are even more satisfactory than those obtainable during the earlier period of growth. The twig and bud characters and the characters of a great variety of fruits are illustrated in detail, and reproductions are given, direct from photographs, of the bark of a number of the species. Several interesting hybrids are also discussed in detail.

The Agaves of the United States.† About

* Juglandaceæ of the United States. By William Trelease. Issued May 26, 1896. Reprinted from the Seventh Annual Report of the Missouri Botanical Garden. Pages 25–46, plates 1-24.

† The Agaves of the United States. By A. Isabel Mulford. Issued May 26, 1896. Reprinted from the Seventh Annual Report of the Missouri Botanical Garden. Pages 47–100, plates 26-63.

twenty years ago the late Dr. Engelmann made an attempt to classify and describe the species of Agave of the United States, the genus to which the Century plant and Maguay belong. Since that time much information and material have been accumulating, and in St. Louis, where Engelmann's notes and specimens are preserved, the study of this difficult genus has been again undertaken. Miss Mulford, whose work was the basis of a thesis for which she obtained the degree of Doctor of Philosophy from Washington University in 1895, has brought together in a carefully arranged synoptical form the technical descriptions of all of those species which are now recognized as occurring within the limits of the United States, and has added much information of a popular character concerning their economic uses. The paper is supplemented by reproductions of habit photographs and a large series of accurate detail illustrations from drawings by Miss Johnson.

*Two Interesting and Rare Water Plants.** Mr. Thompson gives an exhaustive account of the structure, and, so far as known, the biology, of two very rare duckweeds, Wolffia gladiata, var. Floridana, and W. lingulata, the former heretofore known only from Florida, but collected last year in the swamps of southern Missouri, where it occurs associated with other peculiarly Floridan plants, such as Leitneria; the other heretofore known only from the Mexican tablelands, but detected by Mr. Thompson in Kern County, California, last year.

GENERAL.

THE associated press sends news of a terrible earthquake disaster in the Island of Yesso, Japan. It is stated that there were as many as 150 shocks lasting in all about 20 hours. The earthquake and the accompaning tidal wave caused great loss of life and property.

THE library building presented to the town of Branford, Conn., by Mr. Timothy Blackstone at a cost of about $300,000 was dedicated on June 17th.

* The Ligulate Wolffias of the United States. By Charles Henry Thompson. Issued May 26, 1896. Reprinted from the Seventh Annual Report of the Missouri Botanical Garden. Pages 101–111, plates 64–66.

THE *Scientific American* states that the Egyptian government has determined to commence a geological survey. The work will be begun this year, and will take about three years for its completion. The estimated cost is $125,000. Capt. H. G. Lyons, R. E., who is at present engaged under the Public Works Department of the Egyptian government in superintending the excavation of the ruined temples of Philæ, will have charge of the survey.

FIFTY photographs from the recent exhibition at the Cosmos Club, Washington, have been selected for purchase by the U. S. National Museum. There will be held next year at Washington a second exhibition of art photography under the name of 'The National Photographic Salon of 1897.'

THE Romanes Lecture for 1896 was delivered by the Right Rev. the Lord Bishop of Peterborough, on June 17, his subject being: 'English National Character.'

WE learn from *Nature* that Sir George Stokes and Dr. Carl L. Griesbach, Director of the Geological Survey of India, have been elected honorary members of the Austrian Academy of Sciences. Dr. Roux has been elected Associate of the Academy of Medicine in the room of the late M. Pasteur.

PROF. F. A. MARCH, of Lafayette College, the eminent philologist, will receive during the present month the degree of Lit. D. from Cambridge University, and the degree of D. C. L. from Oxford University.

MISS L. BRUCE has given to the University of Heidelberg a photographic telescope said to be even larger than the one she gave to Harvard University.

THE Mississippi Valley Medical Association will meet at St. Paul, Minn., under the presidency of Dr. H. O. Walker, from October 20th to 23d.

AT a meeting of the board of managers of the New York Botanical Garden on June 17th the Committee on Plans reported favorable progress, and the report of the Committee on Annual Members, Fellows and Patrons stated that a large number of annual members had been recently added to the rolls, and that President

Seth Low and F. F. Thompson had qualified as fellows by the payment of $1,000 each. The Director-in-Chief, Dr. Britton, was authorized to secure the assistance of engineers, landscape architects and gardeners in preparing the plans for the development of the Bronx Park site. Several gifts were announced, including the herbarium of the late Harry Edwards, from Mrs. Esther Herrman.

Garden and Forest states that a preliminary meeting of citizens of New York interested in tree-planting in the residence portions of the city was held May 22d, and it was proposed to regularly organize the association and elect officers on Thursday, June 25th, at 3:30 p. m., in the rooms of the Wool Club. Mayor Strong has consented to the use of his name for President, and many well-know citizens have signified their intention to become members. The annual dues of the society will not exceed $5.00, and the receipts will be used to publish pamphlets and in disseminating information to the public on the best methods of planting shade trees on streets, the best sorts for this purpose, etc. Application for membership may be made to Cornelius B. Mitchell, 64 and 66 White street, New York. We also learn from the same journal that seven hundred and seventy-five members have already enrolled themselves in the Audubon Society, established a few weeks ago in Boston. The object of the Society is to preserve our native birds by discouraging the use of their feathers in personal decoration. Among the Vice-Presidents of the Society are the senior Senator of Massachusetts, the President of the Massachusetts Historical Society, the President of the Massachusetts Society for Promoting Agriculture, and many other well-known citizens and a number of women distinguished for their artistic and social attainments. Any one can become a member of the Society by agreeing not to purchase or wear the feathers of wild birds and paying $1.00. The Secretary, to whom all communications should be addressed, is Miss Harriet E. Richards, Boston Society of Natural History, Boston. There are no annual dues.

A NEW monthly journal, devoted especially to the study of children, edited by Prof. Earl Barnes, will hereafter be published from Stanford University.

AN X-ray studio has been opened by Mr. M. F. Martin, at 110 East 26th street, New York.

IN a paper first presented before the Michigan Academy of Science, and now priuted in *The Inlander*, Mr. Harlan I. Smith urges the importance of making a systematic archæological survey of the State of Michigan, with the University as headquarters. It would be a great advantage to have recorded on a map the position of pre-historic remains, in order that permission might be obtained to make scientific excavations when opportunity offered, and in order that preference might be given to those remains least likely to remain intact.

THE degree of D. C. L. will be conferred by Oxford University on Sir Archibald Geikie, K. C. B., F. R. S., Director-General of the Geological Survey of the United Kingdom.

MISS HELEN KELLAR, who, deaf and blind, has displayed unusual ability, will be placed, next autumn, in the Gilman training school, with a view to preparation for Radcliffe College. The education and mental attainments of Helen Kellar are even more interesting than in the case of Laura Bridgeman. Those who are interested will find an account by her able teacher, Miss Sullivan, in a publication from the Volta Bureau, 1892, and in an article by Prof. Jastrow in *The Psychological Review* for 1894.

IN a recent number of SCIENCE we called attention to the international membership of the German Chemical Society. A striking contrast is found in the recently published list of members of the Chemical Society (London). Out of 2,067 members, over eighty-five per cent. are residents of the United Kingdom, and more than half the remainder of British colonies. Of the 140 foreign members 92 are American, 16 German, 7 Japanese, and the remaining 25 from eighteen different countries. Considering the Journal of the Chemical Society and its invaluable abstracts, it is rather surprising that the Society should have so few members outside of the British Empire.

THE first part of a very important work by Drs. D. S. Jordan and B. W. Evermann, en-

titled 'The Fishes of North and Middle America,' has been for some time in type and will be published shortly by the Smithsonian Institution. This part will be a volume of over 1,250 pages and will embrace descriptions of 1,239 species under 522 genera. According to the preface, "the classification and sequence of groups * * * adopted is essentially that of Dr. Theodore Gill," and the part in press covers the families from Branchiostomidæ to Priacanthidæ, including 148 families. The second part, which may be even larger than the first, it is expected, will appear early next winter.

According to the *British Medical Journal* a society has recently been formed entitled 'L'Alliance Nationale pour le Relévement de la Population Francaise par l'Egalité des Familles devant les Impôts.' M. Bertillon, the Director of the city of Paris statistics, is the founder of the Society. A committee has been formed composed of M. Bertillon; Prof. Richet, of the Paris Medical Faculty; Dr. Javal, member of the Academy of Medicine and of the Chamber of Deputies; M. Honnorat and M. Cheysson. The first meeting of the Society was held on May 16th, and was attended by about a hundred people.

The daily papers contain several communications regarding reputed anticipations of the X-rays sufficiently curious to deserve repetition. Dr. G. A. Brown is stated, by the *Grand Rapids Herald*, to have in his possession a magazine entitled the *Mechanics' Mirror*, which, in 1846, is said to contain this announcement: "The following communication was made to the Academie Royale des Sciences de Paris at its last meeting by a Greek physiologist, A. M. Esseltja, who asserts that by the assistance of electric light he has been enabled to see through the human body, and thus to detect the existence of deep-seated disease. He has followed the operations of digestion and of circulation. He has seen the nerves in motion. M. Esseltja has imposed the name of 'Anthroposcope' on his extraordinary discovery (?). According to the *Scientific American*, Mr. John P. Moss writes to the *Daily News* under the heading 'Nothing New under the Sun,' quoting the following paragraph from Dr. Priestley's Electricity, 1769. It describes an experiment made by Mr. Hawkesbee in 1709. "He (Mr. Hawkesbee) lined more than the half of the inside of a glass globe with sealing wax, and having exhausted the globe, he put it in motion; when, applying his hand to excite it, he saw the shape and figure of all the parts of his hand distinctly and perfectly on the concave superficies of the wax within. It was as if there had only been pure glass and no wax interposed between his eye and his hand." Baron Reichenbach claimed that his light from the poles of a magnet would pass through the fingers.

Mr. G. C. Bourne has contributed to *Science Progress* two interesting articles on the present position of the cell theory. After reviewing recent work and theories he concludes that life is possible only when two (or more) substances of complex chemical constitution are brought together, and that when these two (or more) substances are brought together we have before us a cell. The cell, therefore, is the vital unit *κατ' ἐξοχήν*. The component parts of the cell are not vital units, for by themselves they are incapable of life; they are the auxiliaries, the indispensable auxiliaries of life, but they are not themselves living. If this be true it is entirely inconsistent with the whole group of theories based upon hypothetical biophors, gemmules, plasomes, physiological units, plastidules et hoc genus omne. The cell theory is the only theory which our knowledge of structure and of life processes permits us to adopt, at least if we confine ourselves to that part of it which is essential, namely, that there is one general principle for the formation of all tissues, animal and vegetable, and that principle is the formation of cells. Cells are the ultimate vital units, though they are not the ultimate structural units; they are the 'Lebenstrager' or biophors, and there are no living individuals lower than cells.

President Jordan, in his *Fishes of Sinaloa*, has recently published the first bulletin of The Hopkins' Biological Laboratory, the recently founded dependence of the Leland Stanford, Jr., University, and it will be received with a great deal of interest by the students of fishes generally. The paper, continuing the well-known work in this region of Dr. Gilbert, consists of a

systematic review of the fishes of the eastern shore of the Californian Gulf, in the Mexican province of Sinaloa. Twenty-nine new species are recorded, many of which are here figured, including a new Saw-fish and several new Sting-rays. The present work, however, can be regarded only as the result of a reconnaissance, although it is clearly of great value. Except in the case of *Chanos*, it deals with no osteological characters; and from the nature of the Hopkins expedition, one can hardly expect that any definite information could have been obtained as to the larval characters of these fishes, or as to the ranges of sexual variation.

ACCORDING to the London *Times*, the British Consul at Piræus mentions in his last report that a Pasteur Institute for the treatment of hydrophobia by inoculation has now been in existence in Athens for some time. During the first 16 months of its existence 201 cases were treated, of which 176 were from Greece, 21 from Egypt, and 4 from Asia Minor. There was only one death, and in this case the patient had delayed going for treatment until 15 days after being bitten. The whole credit of founding the institution belongs to Dr. Pampoukis, the director, who was sent to study under M. Pasteur in Paris in 1886, and who, on his return, started a microbiological institute at his own expense and conducted a series of valuable experiments for the government. He opened the Pasteur Institute in August, 1894, at his own expense; small allowances have since been made to him by the municipality and the government. It is practically impossible to overestimate the value of such an establishment in the Levant, and its existence ought to be widely known. Not only does the curse of masterless dogs exist in Greece, but even more so in the neighboring countries. A muzzling order does exist in Attica, but it is not enforced, and the strewing of poisoned meat in the streets of Athens and Piræus is apparently the only attempt made by the authorities to deal with an increasing amount of rabies. The lack of water and the prevailing disregard of all forms of animal suffering largely contribute to this result.

THE N. Y. *Evening Post* states that the agricultural extension work carried on by Cornell professors under the provisions of the Nixon fund i being yearly extended. Originally confined to the Chautauqua grape belt, it was last year extended to Genesee. This year Prof. Bailey has organized work in Oswego county, where experiments in strawberry culture are to be made, and in Onondaga and Oneida counties. The work in each county partakes of the prevailing local farm industry.

THE School of Applied Ethics, which for the past four years has held sessions at Plymouth, will omit the session this year.

UNIVERSITY AND EDUCATIONAL NEWS.

DR. B. I. WHEELER, of Cornell University, has been elected president of the University of Rochester.

PROF. GRAVES, of Tufts College, has been elected president of the University of Wyoming.

MRS. S. W. BOCOCK has given $5,000 to Yale University for the purchase of books in social science.

AT Cornell University an appropriation of $15,000 has been made for constructing a hydraulic laboratory for the College of Civil Engineering, and $30,000 has been appropriated for an addition to Lincoln Hall, for the accommodation of the College of Architecture.

THE present and past students of Radcliffe College and the Cambridge School are uniting to found a scholarship at Radcliffe College to be known as the Arthur Gilman Scholarship in recognition of the services of Mr. Gilman, who is about to resign his office of Regent.

AT Smith College Miss G. A. Smith has been appointed assistant in botany, Miss H. W. Bigelow, assistant in astronomy; Miss L. D. Wallace, assistant in zoölogy, and Miss E. S. Mason, instructor is chemistry.

DR. WESTERMAIER has been called to a professorship of botany in the University of Freiburg, Switzerland; Dr. Peltz to the chair of mathematics in the Technical High School at Prague, and Dr. Went to the professorship of botany in the University of Utrecht in the place of Prof. Rauwenhoff, who has retired.

AT the commencement exercises of Cornell University, President Schurman made an ad-