Strabo has been called the greatest geographer of ancient times. His views on geographical subjects were remarkably advanced, and his statements on the particular division of geography which has now become known as climatology were in most cases surprisingly accurate. In the little volume before us, Dr. Rid gives an excellent presentation of Strabo's views on climatological matters. While adopting the division of the earth's surface into five zones, which Parmenides had probably originally proposed, Strabo recognized the fact that the 'torrid' zone, which was then believed to be uninhabitable because of the heat, was at least partly habitable. He was also the first of the Greeks to state explicitly the fact that mountain climates have lower temperatures than the surrounding lowlands. He realized that what we now call *solar* climate is much modified by the physical features of the earth's surface, and that a latitude line runs through diverse climates. This was a distinct step in advance. Some of the relations of climate and man were emphasized by Strabo in much the same words as those we use to-day. The discussion by Dr. Rid will prove interesting to classical students as well as to climatologists.

R. DEC. WARD.

SCIENTIFIC JOURNALS AND ARTICLES.

THE October-November number of *The Journal of Geology* gives a biographic sketch of Ferdinand, Freiherr von Richthofen, by Mr. Bailey Willis. This is followed by the leading article, entitled 'Structure and Relationships of American Labyrinthodontidæ,' by E. B. Branson. He describes a new genus and under it two new species. The article is accompanied by fourteen figures. Professor John J. Stevenson's 'Recent Geology of Spitzbergen' deals mostly with glaciation and the submerged channels of the island. Professor Stuart Weller, in his article on 'The Northern and Southern Kinderhook Faunas,' says: "The interrelationships of the various expressions of the Louisiana-Kinderhook-Burlington faunas under discussion are such as to make their correlation a matter of some certainty." The last article of the number is an illustrated one on 'The Development of Scaphites,' by W. D. Smith. The writer concludes that 'the genus *Scaphites* is in need of revision' since it is polyphyletic.

THE fore-part of the October number of *The American Geologist* is devoted to 'Ten Years' Progress in the Mammalian Paleontology of North America,' by Professor Henry Fairfield Osborn. He traces the lines along which research has been conducted and points out the directions in which future results may be expected. Dr. Osborn's article is illustrated by seven diagrammatic figures. 'Some Geological Observations on the Central Part of the Rosebud Indian Reservation,' by Mr. Albert B. Reagan, gives some interesting sections of Tertiary and Cretaceous formations and also an account of the surface features with a geological map of the reservation. Dr. August F. Foerste's 'Notes on the Distribution of Brachiopoda in the Arnheim and Waynesville Beds' give some valuable information regarding species found associated in these beds. In the editorial comment on 'The Willamette Meteorite' Professor Winchell takes exception to Dr. Ward's atmospheric pressure theory of the formation of the concavities in its base and regards them as the spaces formerly occupied by some such minerals as olivine and troilite which have been removed since its fall by the ordinary processes of rock decay.

SOCIETIES AND ACADEMIES.

THE OHIO ACADEMY OF SCIENCE.

THE fifteenth annual meeting of the academy was held in Cincinnati on November 30, December 1 and 2, 1905, the president of the society, Professor Herbert Osborn, presiding. On Thursday evening an informal meeting took place at the Museum of the Society of Natural History. The sessions on Friday and Saturday were held in Cunningham Hall, at the University of Cincinnati.

The address of the president of the society, on 'The Origin of the Wings of Insects,' occurred at 1:15 P.M., on Friday, and at 7:30 P.M. President Dabney of the University of Cincinnati, vice-president of the society, de-

livered an address entitled 'Our Modern Universities.' Other important papers were those by Professor C. J. Herrick, 'On the Present Status of Comparative Psychology, Professor M. F. Guyer, on 'Guinea-chicken Hybrids' and Mr. A. F. Burgess, on 'A Preliminary Report on the Mosquitoes of Ohio.'

The following program was presented:

Robert F. Griggs: 'Report on the Willows of Ohio.'

J. H. Todd: 'The Relation of Medicine to Anthropology.'

Henry F. Kock: 'Observations on *Euglena viridis* and *Euglena sanguinea*.'

E. W. Berger: 'Habits of the Pseudoscorpionidæ (principally *Chelanops oblongus* Say).'

H. P. Fischbach: 'Some Notes on a Myxobolus Occurring in a Diseased Fish (*Abramis chrysoleucas*).'

F. J. Hillig: 'A New Case of Mutation (*Commelina nudiflora*).'

F. Carney: 'The Geology of Perry Township, Licking Co.,' illustrated by lantern slides.

Charles Dury: 'How to Collect and Breed Xenos.'

L. B. Walton: 'A New Species of Japyx (*J. macgillvrayi*) with some Notes on the Morphology of the Hexapoda and Chilopoda.'

J. S. Hine: 'Notes on some Ohio Mammals.'

W. A. Kellerman: 'Corn Rust Cultures.'

W. F. Mercer: 'The Relation of the Motor Nerve-Endings to the Voluntary Muscle in Amphibia.'

J. H. Schaffner: 'The Reduction of the Chromosomes in Microsporocytes.'

A. D. Cole: 'Optical Experiments with Electric Radiation.'

M. F. Guyer: 'Guinea-chicken Hybrids.'

L. G. Westgate: 'Glacial Erosion in the Finger Lakes Region, New York.'

L. B. Walton: 'The Naididæ of Cedar Point, Ohio.'

Harris Handcock: 'The Present State in the Development of the Elliptic Functions.'

W. C. Mills: 'Mammilla of the Baum Village Site.'

W. R. Lazenby: 'Foreign Trees Naturalized in Ohio.'

E. W. Berger: 'Notes on the Fall Webworm (*Hyphantria cunea*) in Ohio.'

J. S. Hine: 'Life-history Notes on Three Species of Mosquitoes.'

A. M. Miller: 'Recent Classification and Mapping of Lower Ordovician in Kentucky.' Illustrated by lantern slides.

S. R. Williams: 'The Anatomy of *Boophilus annulatus* Say.'

C. J. Herrick: 'On the Present Status of Comparative Psychology.'

W. A. Kellerman: 'A Botanical Trip Through Gautemala.' Illustrated with lantern slides.

Herbert Osborn: 'Further Report on the Hemiptera of Ohio.'

J. M. VanHook: '*Ascochyta pisi*, a Fungus of Seed Peas.'

Lynds Jones: 'Additions to the Birds of Ohio.'

W. A. Kellerman: 'Exhibition of Selected Gautemalan Plants.'

J. H. Todd: 'The Garden of the Titans—Its Geology.'

Chas. Brookover: 'The Prosencephalon of *Amia calva*.'

E. L. Moseley: 'The Cause of Trembles in Cattle, Sheep and Horses, and of Milk-sickness in Man.'

G. D. Hubbard: 'Physiography and Geography.'

W. C. Mills: 'Description of a Teepe Site, Baum Village Site.'

C. E. Ballard: 'A New Gregarine from the Grasshopper (*Melanoplus atlanis*).'

W. R. Lazenby: 'Habits of Introduced Weeds.'

G. B. Halsted: 'An Application of Non-Euclidean Geometry.'

W. F. Mercer: 'Development of the Respiratory System in Amphibians.'

Gerald Fowke: 'Superficial Geology between St. Louis and Cairo.'

W. C. Mills: 'Human Jaws as Ornaments.'

L. B. Walton: 'Some Laboratory Methods.'

W. R. Lazenby: 'Notes on the Germination of Seeds.'

F. Carney: 'Glacial Studies in the Vicinity of Newark.'

A. F. Burgess: 'A Preliminary Report on the Mosquitoes of Ohio.'

W. A. Kellerman, H. H. York and H. A. Gleason: 'Annual Report on the State Herbarium.'

Lynds Jones: 'A Contribution to the Life History of the Common Tern (*Sterna hirundo*).'

F. O. Grover: 'Notes on some Ohio Spermatophytes.'

W. B. Hermes: 'Studies on Insects that Act as Scavengers of the Organic Beach Debris.'

Albert Wetzstein: 'A List of the Plants of Auglaize Co., O.'

R. E. Brockett: 'Some Plants on the Campus and in the Vicinity of Rio Grande College.'

Lumina C. Riddle: 'Bembicidæ of Ohio and

Notes on Life History of *Microbembex monodonta* Say, and *Bembex texana* Cress.'

C. F. JACKSON: 'A Key to the Families and Genera of Thysanura with a Preliminary List of Ohio Species.'

JAS. A. NELSON: 'A Note on the Occurrence of Sex Organs in Æolosoma.'

J. LINDAHL: 'Barite in a New Form (Pisolitic) from a 1,400 Foot Boring for Oil at Saratoga, Texas.'

VICTOR STERKI: 'Preliminary List of Land and Fresh Water Mollusca of Ohio.'

VICTOR STERKI: 'A Suggestion with Respect to Local Fauna Lists.'

VICTOR STERKI: 'Some General Notes on the Land and Fresh-water Mollusca.'

Several important resolutions were adopted. Among those of local interest was that relating to a proposed natural history survey of the state, a committee consisting of the retiring president, and the president and secretary elect, being appointed for the purpose of bringing the matter before the general assembly. A committee was also appointed for the purpose of securing the cooperation of the libraries in the state to the end that scientific papers be rendered more available for members of the society.

A resolution urging the necessity for a biological survey of the Panama Canal Zone before the cutting of the canal was unanimously adopted and the secretary was instructed to transmit the resolution to the proper authorities at Washington.

After resolutions were passed expressing the appreciation of the society for the courtesies extended by the people of Cincinnati, the faculty of the University of Cincinnati, and the officers of the Museum of Natural History, and, furthermore, thanking Mr. Emerson McMillin, of New York, for his continued interest in the welfare of the academy, the society adjourned. The following officers were elected.

President—Dr. E. L. Rice, Delaware, Ohio.

Vice-Presidents—Mr. Chas. Dury, of Cincinnati, Ohio, and Professor Lynds Jones, of Oberlin, Ohio.

Secretary—Dr. L. B. Walton, Gambier, Ohio.

Treasurer—Professor J. S. Hine, Columbus, Ohio.

Librarian—Professor W. C. Mills, Columbus, Ohio.

Executive Committee (ex-officio)—Dr. E. L. Rice, Delaware; Dr. L. B. Walton, Gambier; Professor J. S. Hine, Columbus; (elective)—Dr. M. F. Guyer, Cincinnati; Dr. L. G. Westgate, Delaware.

Board of Trustees—Dr. G. B. Halsted (in place of retiring trustee).

L. B. WALTON,
Secretary.

THE INDIANA ACADEMY OF SCIENCE.

THE twenty-first annual meeting of the Indiana Academy of Science was held at Indianapolis, on December 1. Forty men and women, mostly young scientific workers of the state, were elected to membership. Eighty-six scientific papers were presented to the academy which met largely in sections. The papers covered topics in physics, chemistry, geology, astronomy, mathematics, botany and zoology. Among those of more general interest were the following:

PROFESSOR F. B. WADE, Shortridge High School: 'Some Scientific Aspects of Tea-drinking.'

BENJAMIN W. DOUGLAS, Indiana University: 'The Use of Peat as Fuel.'

ROBERT HESSLER, M.D., Logansport: 'The Chronic Ill-health of Darwin, Huxley, Spencer and George Eliot.

PROFESSOR JOHN A. MILLER, Indiana University: 'The Solar Eclipse of 1905' (lantern).

PROFESSOR J. C. ARTHUR, Purdue University: 'Notes on the International Botanical Congress of 1905.'

PROFESSOR C. H. EIGENMANN, Indiana University: 'The Habitat and Life History of the Cuban Blind Fishes' (lantern).

The following resolution was adopted:

Resolved: That it is the sense of this academy that the United States government should immediately undertake a complete biological survey of the Panama Canal zone.

The following officers were elected for the coming year:

President—Robert Hessler, M.D., Logansport.

Vice-President—Professor D. M. Mottier, Indiana University.

Secretary—Professor L. B. McMullen, Shortridge High School, Indianapolis.

Assistant Secretary—Professor J. H. Ransom, Purdue University.

Treasurer—Professor W. A. McBeth, State Normal School, Terre Haute.

Editor—Professor E. G. Martin, Purdue University.

J. H. Ransom,
Assistant Secretary.

SOCIETY OF GEOHYDROLOGISTS, WASHINGTON.

The second regular meeting of the society was held on January 3.

An informal discussion was held as to the desirability of substituting the designation 'Division of Underground Waters' for 'Division of Hydrology' as the name for the section of the United States Geological Survey devoted to the investigation of underground waters. This was followed by the regular program.

Definition of 'artesian.' Discussion by M. L. Fuller, G. B. Richardson, C. E. Siebenthal, C. A. Fisher, W. T. Lee and others.

Supplementary to the paper presented by Mr. Fuller at the preceding meeting summaries were presented of the arguments for the various usages of the term, including: (1) For flowing wells, (2) non-flowing wells in which the water rises and (3) deep drilled wells. The relations of deep wells were analyzed and the established facts bearing on the use of the term enumerated. It was agreed that: (1) The original use of 'artesian' was for flowing wells, (2) that the present usage among scientists is not uniform, the number favoring the restriction of the term to flows varying, in a broad way, inversely with the amount of experience in underground water investigation, (3) the popular usage is likewise exceedingly variable, people in areas of non-flowing wells applying the term to any deep wells, while those in flowing well areas use it for this class of wells only, and (4) no definite meaning can be assigned to the word in a given publication unless a definition is given in the same paper.

Terms to distinguish common wells from wells in which water rises, for flowing and non-flowing hydrostatic wells, for the hydrostatic principle, for the hydrostatic basin, for confined and for unconfined shallow groundwaters were regarded as necessary. It was agreed that the term artesian is too expressive to be dropped, notwithstanding its various usages, and that it is the best word for the hydrostatic principle, for the hydrostatic basin, and for water under pressure. It was not, however, considered desirable to extend such usage, depending as it does upon well-defined properties of liquids, upon definite physical laws, and on fundamental geological conditions to cover the incidental features, like the flows of wells, which are dependent in many cases or mere accidents of topography. The application of 'artesian' to all wells in which the water is under hydrostatic pressure was favored.

Indraft Wells in Southern Georgia: M. L. Fuller.

Two wells sunk in the Vicksburg-Jackson limestone in southern Georgia, and characterized by a continuous indraft of air, have recently been reported by Mr. S. W. McCallie, who investigated the phenomena at the speaker's request. One of the wells, located at Boston, encountered a rapidly moving subterranean stream in the limestone at one hundred and twenty feet, the sound of which was distinctly audible. A strong indraft was noted after the completion of the well, which continued without change until the well was finally connected with a pump. The other well, located in the same general locality, encountered a similar swiftly moving underground stream in the limestone and presented the same strong indraft. Investigation showed that the current was always in the same direction and was independent of barometric pressure and temperature. Mr. McCallie believes that the sucking in of the air is due to the friction of the rapidly moving water on the air, which is drawn in and carried onward until the water rises as one of the large limestone springs of the region. The conditions are almost exactly reproduced artificially in the Richard suction apparatus in use in nearly all chemical laboratories.

M. L. Fuller,
Secretary.

THE AMERICAN CHEMICAL SOCIETY. NEW YORK SECTION.

The third regular meeting of the New York Section, American Chemical Society, was held

at the Chemists' Club, 108 West 55th Street, on Friday, December 8. Messrs. Dr. Wm. J. Schieffelin, Dr. F. D. Dodge, Hugo Schweitzer, T. J. Parker and Leo Baekeland were elected councilors and the following papers were read:

The Biological Effects of Radium: GUSTAVE M. MEYER.

A résumé of the results of the investigations carried out at the suggestion of Dr. Gies by Drs. Gager, Burton-Opitz and Meyer and Messrs. Berg, Welker and Hussakoff concerning the effects of radium and radium rays on plants and animals. A preliminary report of the same has already appeared in SCIENCE, Vol. 21, pp. 987–988, June, 1905.

The Estimation of Minute Quantities of Arsenic: H. B. BISHOP.

For the determination of traces of arsenic in sulphuric acid, brimstone, organic matter and most substances soluble in or decomposed by hot concentrated sulphuric acid, the arsenic is separated by distillation with a mixture of sulphurous and hydrochloric acids, and is estimated by a modified Marsh test. By this method arsenic-free sulphuric acid has been prepared and .0000001 per cent. arsenic has been added and accurately estimated. The special advantages are that large samples may be taken, few reagents are required and the arsenic is separated from interfering substances without loss, so that the Marsh test can be made under standard conditions.

A New Apparatus for the Extraction of Tannic Acid: ALLEN ROGERS.

For the analysis of tea, coffee and tannin, the author has obtained very satisfactory results by the use of an extraction apparatus consisting of two flasks so arranged and connected by tubes that the solution may be drawn repeatedly over the material to be extracted, the temperature being regulated by placing the apparatus on a water-bath or other source of heat.

The Synthesis of 6-Brom-quinazolines. M. T. BOGERT and W. F. HAND.

The authors describe the synthesis of 6-brom-quinazolines from 5-brom-2-amino-benzoic acid, 5-brom-2-acetaminobenzoic, 5-brom-2-acetaminobenzonitrile, and from 5-brom-2-acetanthranil. The following quinazolines were prepared, with certain of their derivatives:

6-Brom-4-ketodihydroquinazoline,
6-Brom-2-methyl-4-ketodihydroquinazoline,
6-Brom-2-ethyl-4-ketodihydroquinazoline,
6-Brom-2-n-propyl-4-ketodihydroquinazoline,
6-Brom-2-i-propyl-4-ketodihydroquinazoline,
6-Brom-2-i-butyl-4-ketodihydroquinazoline,
6-Brom-2-i-amyl-4-ketodihydroquinazoline,
6-Brom-2-methyl-3-phenyl-4-ketodihydroquinazoline,
6-Brom-2-3-o-tolyl-4-ketodihydroquinazoline.

The Constitution of Quinine: B. L. MURRAY.

A review of our knowledge of the molecular constitution of quinine as ascertained from its chemical reactions, so far as we are able to interpret them to-day. Quinine is so readily decomposed into two different classes of bodies, that its molecule is regarded as consisting of two separate halves; the one a metho-oxy-quinoline, the other a hydrogenated pyridine with side chains at beta and gamma. One side chain is unsaturated, while the gamma side chain is connected both to the nitrogen of its own nucleus, and to the gamma carbon of the quinoline nucleus, thus serving to join the two half molecules. The hydroxyl of quinine is located in this connecting chain, and the methoxy group is found in para-position on the quinoline nucleus.

F. H. POUGH,
Secretary.

THE AMERICAN CHEMICAL SOCIETY.
NORTHEASTERN SECTION.

THE sixty-fourth regular meeting of the section was held Friday evening, December 22, at Simmons College, with President Parsons in the chair. About forty members were present.

Professor James A. Norris addressed the section on 'An Investigation of the Elementary Nature of Tellurium,' in which he discussed the position of tellurium in Mendelejeff's classification, and reviewed the work of various chemists on the atomic weight of that element, and described his own work in preparing pure basic tellurium nitrate, and determining the atomic weight of tellurium by converting that nitrate into tellurium di-

oxide. The tellurium was purified from the members of the other groups of the Mendelejeff's table by precipitating the chloride with sodium thiosulphate, and treating the $Na_2S_4TeO_6$ formed with an alkali. The Te thus obtained was further separated from members of the same group by fractional sublimation of TeO_2. The results obtained for the atomic weight of tellurium agreed very closely with that previously obtained by Brauner, Kothner and others, and the conclusions were drawn that the atomic weight of Te has been accurately determined, that the Te used contains no other element known or unknown, and also that the atomic weight of iodine has been correctly determined. The position of Te in the sixth or eighth group of the table was also discussed.

ARTHUR M. COMEY,
Secretary.

DISCUSSION AND CORRESPONDENCE.

HEREDITY AND SUBSPECIES.

I HAVE read with deep interest, and some surprise, two recent articles in this journal by President David Starr Jordan, entitled, respectively, 'The Loch Leven Trout'[1] and 'Ontogenetic Species and Other Species.'[2] To take them up in sequence, the facts presented in the first article are, in substance, that a trout found in Loch Leven differs from the trout of neighboring lakes and streams in its 'large size, more silvery color, sparcity of spots, the red spots and ocelli characteristic of the brook trout * * * being usually wanting,' while 'the orange edge of the adipose fin, characteristic of the brook trout, is wanting in the Loch Leven trout.' These differences are so marked that the Loch Leven trout (*Salmo levinensis*) 'has been usually considered as a valid species, distinct from the other trout of Great Britain.' President Jordan cites Dr. Day as stating that the Loch Leven trout changes into the ordinary brook trout of England (*Salmo fario*), 'when planted in streams of Gloucester or Guilford, the colors of the Loch Leven trout being seen on exceptionally well-fed individuals only.' He also quotes Dr. Day as regarding some fifteen or more other commonly recognized species of trout inhabiting the lakes, streams and estuaries of Great Britain and northern Europe as 'all forms of one and the same species'; and adds:

> A member of one of these so-called species would be changed to one of the others if it grew up under the same surroundings. These forms are not subspecies, for that implies a divergence which should be hereditary, however slight. They are, if this view is correct, local variations of one species, * * *.

Elsewhere in the same article, President Jordan states the results of transferring Loch Leven trout to the waters of the Yosemite National Park in California, where in the course of ten years they have come to be 'exact representatives in form and color of the common brook trout as seen in the streams of England.' He further says: 'These Loch Leven trout in the Yosemite are typical *Salmo fario,* or brown trout of England.'

While these facts are of extreme interest, and have an important bearing on the evolution and character of local forms, they merely emphasize and confirm conclusions derived from general considerations, and not based on experimental research; or, as in this case, on the incidental results of fish-culture. They point the way, however, to a field of investigation evidently pregnant with interesting results, to which President Jordan has forcibly called attention in his later article on 'Ontogenetic Species and Other Species.' In this paper, however, he takes a position that seems to me quite new, and directly antagonistic to the views held, I think, by the generality of students of geographical variation in birds and mammals, as regards the nature of species and subspecies. He says, for example:

> It remains, however, to be determined whether these environmental forms—these species and subspecies produced by the direct influence of heat, cold, humidity and aridity—are 'ontogenetic species' * * * or whether they have a real existence outside the lifetime of the individuals actually composing the group or species. We do not know which of the traits induced by direct action of the environment, if any, are

[1] SCIENCE, N. S., Vol. XXII., No. 570, pp. 714, 715, December 1, 1905.

[2] *Ibid.*, No. 574, pp. 872, 873, December 29, 1905.