

antennal characters (allowing a good deal of variation) were specific. Of course, it is quite possible that the English insect is more variable than the American ones, as is true of certain English plant genera, *e. g.*, *Rubus* and *Hieracium*.

One of the best tests in all such cases is the transplanting of specimens to different food-plants. Mr. Newstead did this rather extensively in the case of *Pulvinaria ribesiae*, which he treats as a variety of *P. vitis*. It was found that the *P. ribesiae* could not live on certain plants which are normally infested by *P. vitis*, and this, I think, should make one hesitate to assume the identity of closely similar forms.

Dactylopus walkeri, Newst., is evidently the British representative of our *D. neomexicanus*, the antennæ and other characters being very similar. In the figure accompanying Newstead's original account of *D. walkeri* the last antennal joint was apparently made too short.

It is strange that no mention whatever is made of *Lecanium liriodendri*, which was described from English specimens.

T. D. A. COCKERELL.

SCIENTIFIC JOURNALS AND ARTICLES.

The Popular Science Monthly for March opens with an article on 'Aerial Navigation,' by O. Chanute, which gives a résumé of what has been accomplished up to the present. W. LeConte Stevens discusses 'The Metric System: Shall it be Compulsory?' intimating that it must not be. J. Madison Taylor has a second paper on 'The Conservation of Energy in Those of Advancing Years' and Edward F. Williams has the first of a series of articles on 'The Royal Prussian Academy of Science, Berlin.' N. L. Britton describes 'The Tropical Station at Cinchona, Jamaica,' and Edw. D. Jones discusses 'Education and Industry,' noting the changes that have taken place in training for commercial life. O. F. Cook presents a paper on 'Evolution Not the Origin of Species,' holding that while evolution may change the character of species it does not originate them, this being due to vital motion. Lafayette B. Mendel gives 'Some Historical Aspects of Vegetarianism' and Naohidé Yatsu gives a sketch of 'Tokyo

Teikoku Diagaku (Imperial University of Japan).'

The Museums Journal of Great Britain for February contains an article on 'The Museum Question in Europe and America,' by Ant. Fritsch, in which the author notes that many undesirable features are to be found in museum buildings through the undue influence of architects. It is noted that most exhibition-collections are too large and a plea is made to have them of smaller size and greater educational value. Alex. M. Rodger describes 'A Method of Mounting Fish with Natural Surroundings,' large, rectangular tanks being employed and the fish preserved in formalin. A meeting is noticed to consider 'The Organization of British Zoologists' and the balance of the number is filled with reviews and notes.

We learn from the *Journal of the American Medical Association* that Dr. K. Kjellberg, of Stockholm, has commenced the publication of a weekly medical journal, to be the official organ for the General Swedish Medical Association. The title is *Almänna Svenska Läkartidningen*. The first two numbers contain instructive articles on 'Arrhenius and the Doctrine of Immunity' and others on Finsen treatment of lupus, paraffin prothesis, etc. The list of collaborators on the journal includes Professor E. Almqvist, J. Borelius, H. Köster and seventeen others. The journal *Eiga* was previously the organ of this association, but it suspended publication on the death of its editor, Dr. Simon, last June.

SOCIETIES AND ACADEMIES.

GEOLOGICAL SOCIETY, WASHINGTON.

THE one hundred and fiftieth meeting of the society was held January 27.

Mr. Wm. H. Dall read a paper on 'The Miocene of Maryland and its Relations,' in which the relations of the Chesapeake Miocene of Maryland to that of Virginia, North Carolina, Florida and the Miocene of central and northern Europe were elucidated and discussed. This paper will form a chapter in the forthcoming report on the Miocene of Maryland,

in the publications of the Geological Survey of that state.

Mr. Ralph Arnold then presented a paper on the 'Faunal Relations of the Carrizo Creek Beds of California.' He first described the physiographic features of the Carrizo Creek country, which lies in San Diego County on the edge of the Colorado Desert near the Mexican boundary line. The faunal relations of the mollusks of the formation were next discussed. The molluscan fauna indicates that the Carrizo Creek beds are for the most part of Miocene age, that they were laid down in comparatively shallow water, and that their fauna bears little relation to other known California Miocene, but is intimately related to the recent fauna of the Gulf of California. These facts point to the conclusion that during at least a part of the Miocene period the Carrizo Creek country was occupied by a tropical shallow sea or gulf, an extension of what is now the Gulf of California; and that this gulf was separated from the cold waters of the main California Miocene sea by a peninsula similar in position to the present peninsula of Lower California. In other words, he concluded that the major physiographic features in the peninsular and gulf region of Lower California were approximately the same in Miocene times as they are at present.

This was followed by a paper by Mr. T. Wayland Vaughan, entitled 'A Californian Tertiary Coral Reef and its Bearing on American Recent Coral Faunas.' The coral reef, concerning which he spoke, occurs in San Diego, County, California, the locality being the same as that of the Carrizo Creek beds described in the preceding paper by Dr. Arnold. Mr. Vaughan first called attention to the striking difference between the recent coral faunas on the Atlantic and Pacific sides of subtropical America.

In the collection that has so far been made from the California fossil reef five genera are represented, all of which occur in the fossil and recent faunas of the Antilles and not one of which is at present known to occur on the Pacific coast. The age of the beds in which these fossils occur has been determined by Drs. Arnold and Dall to be Lower Miocene. The

following conclusions seem warranted: (1) There was water communication between the Atlantic and Pacific across Central America not much previous to the Upper Oligocene or Lower Miocene, that is, during the Upper Eocene or Lower Oligocene. This conclusion is the same as that reached by Messrs. Hill and Dall, theirs, however, being based upon a study of the fossil mollusks. (2) During Lower Miocene time the West Indian type of coral fauna extended westward into the Pacific and it was subsequent to that time that the Pacific and Atlantic faunas have become so markedly differentiated.

ALFRED H. BROOKS,
Secretary.

NEW YORK ACADEMY OF SCIENCES.

SECTION OF BIOLOGY.

At the February meeting the following papers were presented:

A New Gigantic Tortoise from the Miocene of Colorado: O. P. HAY.

This tortoise was discovered during the year 1901 by Mr. Barnum Brown, of the American Museum of Natural History, in the Pawnee beds of the Miocene, in the northeastern part of Colorado. The remains consist of the shell complete; the skull, lacking the lower jaw; the pelvis and hind limbs; the terminal portion of the tail; and portions of the dermal armor. These materials were exhibited before the academy.

The length of the carapace is about 31 inches. It is high and tumid, with the sides at the bridge perpendicular, and with the hinder border little flaring. The outline is truncated in front, broadly rounded behind, and only slightly repand. The free edges are acute. The bridge peripherals rise somewhat above the middle of the height of the shell, their length transversely to the animal being nearly equal to that of the costal plates. The nuchal scute is narrow; the vertebral scutes not so wide as the costal scutes. The anterior lip of the plastron is broad, rounded in front, and slightly notched in the midline. The posterior lobe has a broad, shallow notch. The pectoral scutes are extremely narrow.

The skull has the palate deeply excavated. The masticatory surface on each side is traversed by a prominent, sharp and dentated ridge. The oral surface of the premaxillaries is excavated for the reception of the tip of the lower jaw. The cutting border of the maxilla is coarsely dentated.

The exposed portions of the hinder limbs, and probably of the fore limbs also, were protected by an armor of dermal bones, as in some living species of the genus. The extremity of the tail is expanded and covered on the upper surface by a plate composed of several bones joined by sutures. The skin of the region around the tail was provided with many pebble-like dermal bones. On the hinder part of each thigh there was a large bony spur. All these bones were covered in life with a thick layer of horn. This new species is named *Testudo osborniana*, in recognition of the interest of Professor H. F. Osborn in the fossil testudines.

Remarks were made by the author of the paper on the geographical and geological distribution of the genus *Testudo* and its related genera, and on their probable origin.

The Flora of Dominica: F. E. LLOYD.

This paper gave a general account of the vegetation of the Island of Dominica, which the author visited during last summer.

The island is of volcanic origin, remarkably broken in contour, and very difficult for travel. The rainfall is excessive, but with considerable differences in distribution. For example, on the west coast there is a mean annual rainfall of 59.51 inches, while 239.50 inches were reported for Middleham in 1901, an amount not far from the mean. The eastern slopes of the island are exposed to the trade winds, and the vegetation, from the shore line to the top of the mountains, shows the effects in the peculiar molding. The temperatures are not excessive, but the atmospheric humidity is great.

The vegetation, excepting in certain restricted areas, is of the tropical rain-forest type. The large trees are clothed with a heavy epiphytic growth chiefly composed of bromeliads, aroids, orchids, ferns and a *Cyclanthera*. At the higher levels the Hymeno-

phyllaceæ, Musci and Hepaticæ predominate, among which, however, many larger ferns and small orchids find a place. Four species of tree ferns, and several species of palms are to be found. *Heliconia*, a plantain-like plant, is very abundant at high altitudes. Lianas and 'ropes,' as air roots are called locally, are abundant.

In the Grand Savannah desert conditions prevail, caused by the small rainfall (59 inches) and the shallow soil underlaid by trap rock. The vegetation here, and along the rocky shore, is quite distinct in character. A viviparous agave and four cacti are here to be found. The savannah is a sloping grassy plain with scattered shrubs and small trees among which occur several *Mimosoideæ*.

The strand vegetation on account of the steep, gravelly character of the shore is meager in species. The sea-grape (*Coccolobis uvifera*) is everywhere, and *Ipomœa pes-capræ* and *Canavalia* are common. *Terminalia* occurs in some localities.

M. A. BIGELOW,
Secretary.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

THE academy now meets in its own building, at 3817 Olive St., and held its regular meeting on February 15.

Rev. Martin S. Brennan delivered a popular lecture on the 'Nebular Hypothesis' according to La Place, illustrated with lantern slides. In the discussion following, Mr. Nipher remarked that he had applied the equations for gaseous nebulae, which had been deduced in his paper on the 'Law of Contraction of Gaseous Nebulae,' to the case of our own planetary system.

Introducing an integration constant into the pressure formula, the pressure and, as a consequence, the temperature, can be made zero at any radius from the center. He had given the constant a value which made the mass of the nebula equal to that of the entire solar system. When the nebula has reached such a stage that the mass external to Neptune's present orbit is equal to Neptune's mass, the density at Neptune's orbit will be 1.93×10^{-15} grams per c.c., and the pressure will be 1.49×10^{-10} atmospheres. The

outer limit of the nebula will be about half a million miles further out, the temperature being zero at the outer limit. This means that molecular motion will not there exist. The forces there acting will be gravitation and the repelling action of light waves from the central nucleus.

The entire mass of Neptune will exist in a space far more highly rarefied than any Crookes tube vacuum.

It is, of course, possible for such nebulae to exist, but it certainly is impossible to believe that such a nebula can throw off a system of planetary bodies. The greater part of our solar nebula must have existed as solid meteoric matter, with a temperature approaching absolute zero. Only the central part, which is now represented by the sun, was largely gaseous, and at a higher temperature.

DISCUSSION AND CORRESPONDENCE.

INSTABILITY OF THE WATER SUPPLY OF THE RIO GRANDE.

TO THE EDITOR OF SCIENCE: In 1540 when Coronado's men were exploring on the Rio Grande, they reported arriving eighty leagues below Tiguex at a place where the river vanished into the ground. Some Amerinds of the region told them it reappeared again much larger farther down. This they did not verify.

As their report of this disappearance, I believe, has usually been ascribed to 'Spanish exaggeration,' it is interesting, as well as important, to place beside it Humboldt's mention, in his 'Political Essay on New Spain,' p. 213 (English translation by John Black), of a similar phenomenon, which took place in 1752.

The whole bed of the river became dry all of a sudden for more than 30 leagues above and 20 leagues below the Passo, and the water of the river precipitated itself into a newly formed chasm and only made its reappearance near the Presidio de San Eleazar. This loss of the Rio del Norte remained for a considerable time; the fine plains which surrounded the Passo and which are intersected with small canals of irrigation, remained without water and the inhabitants dug wells in the sand with which the bed of the river was filled. At length after the lapse of several

weeks the water resumed its ancient course, no doubt because the chasm and the subterraneous conductors had filled up.

From this it seems fair to infer that the Spaniards of 1540 were witnesses of a phenomenon which repeated itself in 1752.

Springs have also been known to be changed, in that region, by earthquake shocks, and it would, therefore, appear that in the past there has been considerable instability in the water supply. There is a probability that a large branch entered the Rio Grande, from the northeast, just above El-Paso, in Coronado's time, which has since vanished, leaving only marshy spots where it once ran. These changes in volume of springs and in stream-flow have, it is needless to say, an important bearing on the archeology of that district.

F. S. DELLENBAUGH.

SPECIAL ARTICLES.

BIOLOGICAL SURVEY OF THE WATERS OF SOUTHERN CALIFORNIA BY THE MARINE LABORATORY OF THE UNIVERSITY OF CALIFORNIA AT SAN DIEGO.

THE marine biological survey undertaken by the Department of Zoology of the University of California of the Pacific Ocean adjacent to the southern coasts of the state in 1901,* continued for six weeks in the summer of 1902 at San Pedro, with a limited amount of shore work and some attention to the plankton of San Pedro harbor, and transferred in the summer of 1903† to San Diego or, more specifically, to Coronado on the peninsular side of the Bay of San Diego was again taken up during the holiday intermission of the university for a period of three weeks from December 15, 1903, to January 6, 1904. The committee of the Chamber of Commerce of San Diego, which raised the funds for the work of the preceding summer provided also, in the

* W. E. Ritter, 'A Summer's Dredging on the Coast of Southern California,' SCIENCE, Vol. XV., p. 53, 1902.

† W. E. Ritter, 'Preliminary Report on the Marine Biological Survey Work carried on by the Zoological Department of the University of California at San Diego,' SCIENCE, Vol. XVIII., pp. 360-366, 1903.