SCIENCE

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INSECTS IN POPULAR DREAD IN NEW MEXICO.

BY C. H. TYLER TOWNSEND.

IN the south-western portion of the United States there are many insects (using the term in its popular sense, and including Arachnida and Myriopoda) which are more or less striking in appearance. The Mexican element, which largely predominates, is wont to clothe many of these forms in superstition and fear. Some of them are more or less poisonous, while others are perfectly harmless. The malignant nature of the poisonous ones is, as a rule, greatly magnified. Space would forbid the detailing in this article of all the species which are held in dread by the Mexicans, and therefore only the most prominent ones will be noticed. It should also be mentioned that many Americans who have lived here for some length of time share to a large extent the fears of the Mexicans in this regard.

The centipedes (*Scolopendra sp.*) in southern New Mexico do not, as a rule, attain a length of more than four or five inches. Some are found at times which measure nearly six inches, but these are exceptional. They are often found in the adobe houses, the roofs of which are thatched and covered with earth. The summer rains disturb them, and they make their appearance inside. No one can be blamed for refusing to pick up a large centipede, yet they are not so dangerous as commonly supposed. As a general rule, a little ammonia applied to the stings will allay all irritation in a few hours, and no swelling will occur. With some persons the effects are more serious. At some future time a paper will be published by the writer, describing cases of bites and stings of this and other poisonous insects.

The whip-scorpion (*Thelyphonus sp.*) occurs here rather sparingly, but attains a good size. It is certainly a formidable looking beast when full grown. The Mexicans call it *viñagron*, and believe, so I am told, that its bite is sure death. A centipede is no comparison to it in the eyes of a Mexican, who would as soon face a rattlesnake or a Gila monster. I have been unable as yet to find anyone here who has been bitten by this insect, and the only specimens I have were brought to me dead. Some authors declare it to be harmless, while others assert the contrary. I believe, however, that a bite from the jaws is more or less poisonous. During a recent excavation in the city of El Paso, Texas, a gang of Mexican laborers was panic-stricken on the appearance, in the hole beside them, of a *viñagron* which had been disclosed by a stroke of the shovel.

The scorpion which occurs here is the smaller light-colored one (*Buthus sp.*), which does not attain a length of much more than two inches, and is usually smaller. It is dreaded by the Mexicans, but the sting is not more severe than that of a hornet, and often causes no swelling and but little irritation, which passes away in a short time.

One of the *Solpugidæ* (probably *Datemes sp.*) occurs here. This family is closely related to the scorpions, and contains some very strange-looking forms. The species in question attains a length of about one and three-quarters inches. The head consists very largely of two massive pairs of jaws, side by side, the two jaws of one pair working vertically on each other instead of horizontally. The pair on one side can work independently of that on the other, and this intensifies the strange appearance of the insect. These are held in great dread, and are doubtless in a certain degree poisonous.

The so-called tarantula (*Lycosa sp.*) comes next, and is undoubtedly the most venomous arthropod we have in this region. It is usually considered deadly. Its bite is attended with serious consequences, if we can believe reports which appear to be well authenticated. The largest specimen I have seen here measures two and one-half inches in the length of its body, which is as large as that of a half-grown mouse.

A huge unshapely cricket (*Stenopelmatus sp.*) is called *miño de la tierra* (child of the earth) by the Mexicans here, for the reason that it occurs in the ground and is supposed to resemble an infant in the form of its head and body. Its bite is believed to be fatal, and the writer once excited the admiration of all present by offering in public to handle all specimens that were brought him. The jaws are large and powerful, and doubtless can bite quite severely, but there is nothing of a poisonous nature connected with the bite. The Mexicans also have a superstition that the *Stenopelmatus* enters the uterus of pregnant females and causes monstrosities. Perhaps the dread of this cricket has arisen from the fact that in general appearance it greatly resembles the solpugid mentioned above.

The rear-horse (*Mantis sp.*) and walking-sticks (*Phasmidæ*) appear to be confounded by the Mexicans, and "old-timers" as well, under the name of *campamoches*. It is one of the most firmly grounded ideas in the mind of the average New Mexico resident, that these insects, when accidentally swallowed by horses or cattle, are sure death to the swallower. No idea apparently could be more absurd, and none is harder to dissipate. I have been told repeatedly of cases where the animal was immediately cut open, and in no case did the operator fail to find a *campamoche* in the stomach. Such positive declarations would almost incline one to the belief that some poisonous properties were resident in the bodies of these insects.

Agricultural College, Las Cruces, New Mexico, June 5.

SCIENTIFIC WORK IN CANADA, AT THE ELEVENTH ANNUAL MEETING OF THE ROYAL SOCIETY OF CANADA, MAY 30 TO JUNE 2.

FIFTEEN papers were read by fellows of the Royal Society of Canada at its last meeting, just closed, in the Section (IV.) of Geology and Biology, and five more in the Department of Chemistry and Physical Sciences (Section III.).

Of the latter, Professor Chapman's paper "On a New Form of Application Goniometer" is of interest to geologists and mineralogists, as is also his additional note "On the Mexican Type in the Crystallization of the Topaz, with some Remarks on Crystallographic Notation."

Then comes Professor J. G. MacGregor's address on "The Fundamental Principles of Abstract Dynamics." Here the independence of Newton's three Laws of Motion is first considered, and an attempt is made to establish it; Maxwell's deduction of the first from the "doctrine of space and time" and Newton's supposed deduction of the third from the first being subjected to criticism. Their sufficiency is then discussed. It is shown that Newton's second interpretation of the third law cannot be regarded either as an enunciation of the law of the conservation of energy or as an hypothesis from which that law may be deduced, and a fourth law is suggested, admitting of this deduction. It is then pointed out that, owing to the essential relativity of acceleration, the laws of motion can hold only by reference to certain points. These points are determined, and more precise enunciations both of the laws of motion and of all deductions from them are thus obtained. Finally, it is shown that the fundamental hypotheses from which all the laws of abstract dynamics can be deduced, may be reduced to two.

Geology and Palæontology come in for seven papers, as follows: Presidential Address, by Mr. G. F. Matthew of St. John, N.B., "On the Diffusion and Sequence of the Cambrian Faunas." In this address an attempt is made to distinguish the littoral and warm-water faunas of the Cambrian age from those which mark greater depths of the sea and cooler water. On the hypothesis that species capable of propagating their kind in the open sea would spread rapidly to all latitudes where the temperature of the sea was favorable, such forms as the graptolites are taken as fixed points in the successive faunas. The relation to the graptolites is noted of various species of other groups of animals, as they occur in different countries. It thus appears that several genera appeared first in America and afterwards spread to Europe. On the other hand, a very close connection appears to have existed between the Cambrian faunas of the north of Europe and those of the Atlantic coast of North America. Hence it is inferred that the temperature of the sea of these two coasts was similar, and the connection between them direct and unimpeded. Equal temperatures in these different latitudes would be maintained by a cold current flowing from the North European to the North Atlantic Coast. The evidence available seems to point to a migration of the American species by a route to the west and north of the main part of the Atlantic Basin.

Mr. Matthew contributed an additional paper, entitled "Illustrations of the Fauna of the St. John Group, No. VII." This is the final paper on this subject, and treats chiefly of the fauna of the highest horizon in the group. It will be accompanied by a list of all the species of the St. John group, showing the several horizons at which they have been found. From the highest horizon itself, the species are of the age of those of the Leirs shale, or thereabout, as shown by the graptolites found here. There are several Orthids, some of which are identical with, or are varieties of, species of the Leirs limestone described by Billings. The few trilobites known are of Cambrian types, and include a *Cyclognathus* allied to *C. micropygus* and a *Euloma*. Several minute pteropods occur in these shales, with the graptolites.

Sir William Dawson, F.R.S., presented a paper "On the Correlation of Early Cretaceous Floras in Canada and the United States and on Some New Plants of this Period." The purpose of this paper is to illustrate the present state of our knowledge respecting the flora of Canada in the early Cretaceous, and to notice some new plants from Anthracite, N.W.T., collected by Dr. H. M. Ami, and from Canmore, collected by Dr. Hayden. It is a continuation of the author's paper on the "Mesozoic Floras of the Rocky Mountain Region of Canada," in the Transactions of the Royal Society of Canada for 1885.

Sir William then introduced Dr. Ami's paper "On the Occurrence of Graptolites and Other Fossils of Quebec Age in the Black Slates of Little Metis, Que." The paper contains notes on, and descriptions of, graptolites and other fossils from a small but interesting collection made by Sir William Dawson in rocks closely related to those from which the remarkable fossils were described conjointly with Dr. George Jennings Hinde.

Mr. J. F. Whiteaves, palæontologist and zoologist to the Dominion Geological Survey, read two papers, and introduced a third by Mr. Lawrence Lambe. In his first paper on the "Fossils of the Hudson River Formation in Manitoba," Mr. Whiteaves gives an historical sketch of the discovery and collection of fossils of that age, by Dr. R. Bell, in 1873; by Dr. Ells, in 1875; Dr. Bell, later, in 1879; and by Messrs. T. C. Weston and D. B. Dowling, in 1884 and 1891–92, respectively. The object of the present paper is to give as complete a list as possible of the fossils of this formation in Manitoba. There are now as many as sixty species in the Museum of the Survey at Ottawa. Mr. Whiteaves's second paper deals with "Notes on the Land and Fresh-Water Mollusca of the Dominion." Mr. Lambe's paper contains an account of the results obtained by that gentleman from a microscopical examination of recent sponges collected, in the waters of the Pacific, along the British Columbia or Canadian coast. The paper is entitled, "On Some Sponges from the Pacific Coast of Canada and Behring Sea." It will be illustrated with drawings made by the author, who is artist to the Geological Survey Department.

Professor L. W. Bailey, Ph.D., of Frederickton, New Brunswick, gives the result of his "Observations on the Geology of South-Western Nova Scotia," in the counties of Shelburne and Yarmouth. A careful description of the various contacts and occurrences of the auriferous rocks and other masses follows a review of the geological structure of the district in question. A geological map accompanies the paper.

"On Palæozoic Corals" is the title of Professor Chapman's contribution to palæontological science. It is an attempt to simplify the determinations of genera in the so-called "Tabulated and Rugose Corals of Palæozoic Rocks."

Dr. Wesley Mills's paper on "Hibernation and Allied States in Animals" referred to the winter sleep of groups of animals below vertebrates, hibernation in cold-blooded animals, hibernation in certain groups of warm-blooded animals, experimental study of the winter sleep of the bat, and especially of the marmot and allied states in man; all of which was followed by a discussion of the true nature of all such phenomena.

Dr. George Lawson presented two important contributions to botanical research. The one bore "On the Literary History and Nomenclature of the Canadian Ferns," the other consisted of "Notes Supplementary to the Revision of Canadian Ranunculaceæ." The object of these notes, the author said, was to bring together such additions as have been made to our Ranunculaceæ by Canadians and others since the first paper was published, in 1883; also to discuss certain moot points in nomenclature and specific relations, that have been started by French, German, and United States writers in botany; further, to bring our knowledge of the Dominion Ranunculaceæ up to date.

Rev. Moses Harvey of St. John's, Newfoundland, and a new fellow of the society, contributed a most important paper "On the Artificial Propagation of Marine Food-Fishes and Edible Crustaceans." This paper deals extensively with the rise and progress of pisciculture, the importance of modern fish-culture, artificial increase of fresh-water and anadromous fishes, also the results obtained by private and national enterprises. Aqui-culture may yet approach agriculture in usefulness. Scientific study of fish-life and the physics of the sea bore intimately on the value of fisheries. The work carried on by the United States Fish Commission, by the Canadian Department of Fisheries, and the success of Norwegian pisciculture, along with the great results already obtained by lobster hatching with the Nielson process, are all discussed by Dr. Harvey, and many important facts of great economic value are noted. The paper ends by calling attention to the need of fishery schools and biological stations in Canada, for the study of fish, and other animals of the sea, of most importance to man. These are of national importance.

Mr. James Fletcher, F.L.S., and Dominion entomologist, contributed two papers in that branch of work. The first was entitled, "Report on a Collection of Coleoptera made on the Queen Charlotte Islands by Rev. J. H. Keen and J. Fletcher;" the second, "The use of Arsenites as Insecticides." Both proved highly interesting and useful.

At the closing general meeting of the society the following were elected to office: president, Dr. J. G. Bourinot; vice-president, Dr. George M. Dawson; honorary secretary, Mr. James Fletcher; honorary treasurer, Dr. A. R. C. Selwyn. In Section III. and IV., which deal more particularly with science and scientific work, the following were elected officers of sections: Section III., president, Professor E. J. Chapman; Section IV., president, Mr. Whiteaves; vice-president, Professor Macoun; secretary, Professor D. P. Penhallow.

The discussions which took place on the papers read were lively throughout, and interesting points were brought to light.

The Royal Society of Canada unanimously agreed to invite the Geological Society of America to meet in Ottawa in December.

NOTES ON STAR PHOTOGRAPHY.

BY ROMYN HITCHCOCK.

THE writer would beg the indulgence of those astronomers who may be induced by the title to read these lines in the expectation that they are the results of practical work in photographing stars. These, unfortunately, he cannot give; but inasmuch as the astronomers have so liberally availed themselves of the simplified methods of modern photography, which they can carry out more or less satisfactorily themselves, it is only fair that photographers should have a word to say now and then in behalf of the branch of investigation which they represent. By the term *photographers* I do not mean mere operators in the dark-room, nor amateurs who can make fine pictures, nor anything of the sort. I mean what may be best designated as photographic chemists, who are practically familiar with the subject from a chemical and scientific standpoint, and capable of conducting researches and designing and using apparatus for that purpose. It is certainly true that astronomers generally have neglected the surest means of achieving the highest success and advancement in their photographic work, in that they have undertaken to carry out themselves that part of it which ought to engage the attention of the highest skill and knowledge of the photographic chemist. So little is this fact recognized, that we actually sent a party to photograph the last eclipse of the sun in Japan, absolutely without either a photographer or a photographic outfit. So far from any effort to utilize the latest knowledge and methods for eclipse work, that expedition might easily have proved a total failure from the absence of the essentials for common work. When the expedition to the coast of Africa was fitted out, great attention was given to designing certain forms of apparatus; but, if I recollect aright, no photographer was chosen until a few days before its departure. Then a certain commercial brand of color-sensitive plates was chosen, but on what grounds, or whether the spectrum sensitiveness of those plates was tested at all, I have never learned. There will be an excellent opportunity for eclipse work next year; but if anything new is to be learned from it, the work of preparation should begin now in a photographic laboratory. We have apparatus enough, or we know perfectly w what is required, but we do not know the photographic process best adapted to the work.

It may be but an idle dream, but I hope to see a photographic laboratory established in connection with one of our large observatories or universities, not for routine work but for purely scientific research in photographic chemistry, such as will enable us to apply the latest knowledge to astronomical and spectrographic work.

An announcement has recently appeared, to the effect that the French astronomers have begun to doubt the value of negatives of stellar bodies taken on orthochromatic plates, because the stellar discs are surrounded by a strong aureola due to the aberration of the red rays of the objective. For this reason the permanent committee on the chart of the heavens has decided to exclude orthochromatic plates for such work.

I presume everyone finds some satisfaction in saying, "I told you so." The announcement leads me to publish now an article, on this subject, which was written in Japan between four and five years ago. It was perfectly clear to me at that time, that color-sensitive plates were being used in astronomical work when the very opposite kind of plates would have been much better for the purpose. Instead of extending the sensitiveness, it should have been restricted as much as possible. My article was not published because I deemed the facts too obvious to require discussion. But since M. Léon Vidal, editor of *Le Moniteur de la Photographie*, has taken, as I believe, an erroneous view of the matter in opposition to the practical results of the astronomers, I have looked up my old MS., and publish it herewith without change.

I would add that the opinion then expressed as regards the future of collodion plates, for all scientific work, has been greatly strengthened by the results of later investigations.

The article referred to is as follows: —

The so-called isochromatic, or orthochromatic, sensitive plates have been recommended for use in astronomical photography, in order to obtain impressions of red or yellow stars along with those having more blue and violet light in their radiations. Spectroscopic observations have shown that the light of different stars differs very much in the proportion of highly refrangible rays, and this difference must be of great influence in determining their photographic action. The ordinary sensitive gelatine plates possess a maximum of sensitiveness near the Fraunhofer line H, but some