order to accept the professorship of horticulture in West Virginia University.

L. R. HESLER, assistant professor of plant pathology in the New York State College of Agriculture at Cornell University, has been appointed professor of botany and head of the department of botany at the University of Tennessee.

NEW appointments in Colorado College include in biology: R. J. Gilmore, Ph.D. (Cornell), professor; A. E. Lambert, Ph.D. (Dartmouth), assistant professor, and Florence Brumback, instructor. In chemistry: F. W. Douglas, Ph.D. (Cornell), of Albion College, associate professor. In philosophy and psychology, A. E. Davies, Ph.D. (Yale), recently professor of philosophy in Ohio State University, professor.

AT the University of North Dakota Howard E. Simpson, associate professor of geology and physiography, has been promoted to a professorship of geographic geology, and Leonard P. Dove, now instructor in geology at Northwestern University, has been appointed assistant professor of geology.

AT the Michigan Agricultural College Mr. C. W. Bennett, graduate assistant in botany, has been appointed instructor to succeed Miss Rose M. Taylor, who died last December. Mr. H. C. Young, absent for a year on leave on account of military service as lieutenant in the Sanitary Corps, has resumed his position as research associate in plant physiology.

MME. CURIE has been appointed professor of radiology in the Warsaw University.

DISCUSSION AND CORRESPONDENCE

OPISTHOTONOS

PAST events can only be interpreted in the light of recent phenomena, and to this rule, first so clearly outlined by Sir Charles Lyell, the writer[1] was adhering when he proposed the interpretation that the attitude of fossil vertebrates often suggested spastic distress and induced an inquiry into the causes of their death. Bashford Dean[2] especially has criticized this interpretation and suggested an alternative, voicing not only his sentiments, but the sentiments of the large majority of paleontologists, for on a recent trip through the east the writer found many of them opposed to this interpretation. The causes for this opposition were puzzling in the extreme until it was learned that one chief cause was that *opisthotonos* is regarded as a phenomenon restricted to the human race, and on rereading my paper I find I owe my readers an apology. It now becomes necessary to say that the phenomena, *opisthotonos, pleurothotonos* and *emprosthotonos* are extremely common among modern vertebrates of all classes, and these phenomena are so commonly seen in medical laboratories as to be well known to sophomore medical students. Captain Weed told me that cats inoculated with cerebrospinal meningitis often died during the night in the opisthotonic position and were found fixed in this attitude by the *rigor mortis*. Rabbits, guinea pigs, dogs, frogs and other laboratory animals frequently exhibit the phenomena. The phenomena occur among modern vertebrates in the order of frequency named as they do also among fossil vertebrates. It was the similarity of these occurrences which first suggested that these phenomena *might* indicate disease among fossil vertebrates.

Dr. Dean is quite right in saying:

> It would trouble one to find recorded cases of it (opisthotonos) in reptiles or birds, amphibia or fishes: even in mammals collectively the percentage of deaths following opisthotonos would evidently be microscopically small.

There is no medical literature bearing on this problem, partly because the phenomena are so commonly seen that medical writers have not deemed it worth while. However, Cushny in his text-book of pharmacology has figured a rabbit in opisthotonos, and most medical works on nervous diseases mention the phenomena, but to date none have discussed it.

It is difficult to see the logic of Dr. Dean's reasoning that the pull of the ligaments in dry-

[1] *Am. Naturalist*, LII., pp. 369–394.

[2] SCIENCE, N. S., XLIX., No. 1267, pp. 357, 1919.

ing or decaying would produce this position. We know first of all that the pull is exerted by the muscles and tendons, and the reason why opisthotonos is the more commonly seen is that the muscles of the neck are strongest. In this spastic condition all the muscles of the body are intensely contracted and the more powerful muscles overcome the resistance of the weaker ones. It is interesting to observe in this connection that in the arm muscles of the male frog the pull of the strong flexors, used in the mating season for retaining the female, overcome the extensors and flex the arms into the attitude of embracing, while in the female frog the extensors overcome the flexors and the arms stick out straight, while in a spastic condition. Occasionally, however, as in pleurothotonos, the lateral muscles overcome the dorsal ones. Secondly the ligaments of the vertebral column are but slightly elastic, and I am sure it would puzzle Dr. Dean to furnish examples of opisthotonos caused by the action of the ligaments. If the ligaments did cause this phenomenon then the head should be pulled the other way, for the ventral ligaments drying first would overpower the dorsal ones. Sheep, cattle and horses are commonly seen dead in this position on the western plains, but no one can prove that the drying or rotting of the ligaments caused the attitude, while it is easily and daily proven that they died in a spastic condition, in opisthotonos.

Opisthotonos and its related phenomena can not be rightly regarded as a special form of disease, but rather as a result accompanying many forms of disease and poisoning. The Century Dictionary regards opisthotonos as a malady, but the word malady in medicine is almost meaningless.

Another important phase of the matter and a more difficult one to solve was suggested by Dr. Matthew. Vertebrate fossils are not always figured and studied in the positions in which they died. They are subject to so many disturbing agencies, wind, water and predatory animals, that we can not be sure that the position is really the one in which they died. Often the limbs and parts of the body are shifted in preparing for museum exhibition. On this point, of course, no one can speak with more authority than can Dr. Matthew, but it occurs to me that a sufficient number of animals have been discovered in an undisturbed position to warrant the conclusion that *some* of the vertebrates preserved in the opisthotonos were the victims of disease. The beautiful skeleton of *Steneosaurus bollensis* in the U. S. National Museum, exhibits one of the most interesting examples of this known to the writer.

The point is still open to discussion. We need more evidence from the medical side as to the exact nature of opisthotonos, and from the paleontological side more exact observations by paleontologists of the positions in which the animals are preserved in the rocks. It will be with extreme interest that further discussion on this interesting topic, the antiquity of disease in all its phases, will be read.

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A CHINESE LAMP IN A YUCATAN MOUND

A recent publication of the United States Bureau of Ethnology is a report of Thomas W. F. Gann on the "Maya Indians of Southern Yucatan and Northern British Honduras." Herein is given an interesting account of the people and a description of a series of mounds presenting very curious examples of the ancient Maya pottery and odd-shaped objects of obsidian. In one mound there was found near its surface a soapstone lamp which Mr. Gann recognizes as markedly unlike other objects of Maya fabrication. He says:

> So widely does it differ from Maya standards that there can be but little doubt that it was introduced in post-Columbian days, probably very soon after the conquest. Another explanation which suggests itself is that the lamp was buried in the mound at a much later date (possibly during the troublous times of the Indian rebellions, between 1840 and 1850) by someone who wished to hide it temporarily, and that it had no connection with the original purpose of the mounds.