during at least one quarter of the year '99–'00 fell below the average necessary for permission to continue his studies.

Mr. Raymond's administration ended precipitately after this report had been presented to the legislature. To the bill providing funds for the maintenance of the University was added a clause which stipulated that none of the funds could be used until Mr. Raymond's resignation had been accepted by the board of regents. Both the president and the board that had supported him were thus legislated out of office.

The new board met in June and elected Dr. Purinton, of Denison, to the presidency of West Virginia University. The following additional changes have since been made in the management of the instruction at the University: The professor of botany was dispensed with on economic grounds, and the department of botany was left in charge of the professor of zoology. The professor of philosophy was given the department of economics, the new president taking charge of the department of philosophy. The premedical and the domestic science departments were abolished, and the head of the domestic science, a Ph.D. in sociology, was made assistant professor of sociology. One of the two professors who had been compelled to resign in the fall by the old board of regents was reelected for one year, and for that year was given a leave of absence without pay. The departments of English literature and rhetoric were divided, and the English literature was given to a Morgantown lady without university training, who had attained some local literary distinction as secretary of the Morgantown Fortnightly Club. The assistant in rhetoric was offered an assistantship in mathematics, and on refusing to teach mathematics was dropped. The professor of German the following day went before the board in regard to their action on the assistant in rhetoric, and as a result the latter was reinstated with an increase of salary of three hundred dollars.

In view of all that has happened at West Virginia University during the past year, it is not easy to foresee what will be its history in the immediate future. * * *

CANNONADE AGAINST HAIL STORMS.

To the Editor of Science: My attention has been called to an article by Professor W. S. Franklin, in your esteemed journal of September 27, page 496, on the control of the weather.

Professor Franklin's argument for the rational plausibility and possible effectiveness of cannonading with vortex rings 'for *inaugurating* at will the storm movements of atmosphere' is very surprising in view of two facts: 1st, Stiger and his followers do not maintain that the rising vortex rings *initiate* storms, but that they *destroy* storms, at least hail storms, turning them aside from their intended paths or converting the hail to rain; 2d, the cannonade against hail has been prosecuted for centuries, and the special vortex ring cannonade has been practised by tens of thousands during the past three years, and yet thus far there has not been reported a single case where cannonading has been logically demonstrated to have been effectual. Hail storms move, divide and pass by on either side, develop and decay, just the same whether the cannons are fired or no! The popular faith in cannonading that seems to prevail among the peasantry of southern Europe is a craze that has no scientific basis whatever. If Professor Franklin has any faith in this process he has but to submit it to a thorough experimental trial: Get a dozen of his neighbors to load their rifles with five ounces of gunpowder, which is the charge recommended by Stiger, leave off the wad so as not to burst the guns, and all fire away as fast as possible when a hail storm is approaching. After actually witnessing the failure of this process let him sit down and calculate approximately the relative amounts of energy in the explosions and in the hail storm.

The importance of unstable equilibrium in the atmosphere is a matter that has been so thoroughly investigated since the days of Espy, that Professor Franklin has only to study the modern literature of meteorology and the mechanics of whirlwinds in order to realize the folly of his argumentation.

The Weather Bureau needs, and hopes to obtain, the hearty cooperation of the best men in American science in order to overcome the dif-

ficulties inherent in the study of meteorology, but I believe that such suggestions as those of Professor Franklin are not the best that science has to offer.

CLEVELAND ABBE.

THE SACRAMENTO FOREST.

TO THE EDITOR OF SCIENCE: In south central New Mexico, capping the scarp of the great monoclinal mountain known as the Sacramento, and overlooking to the west the Tularosa desert, is a unique and beautiful forest tract. It forms a detaining mat of vegetation which supplies a large group of running streams and their dependent agriculture. It is, also, a moist and forested resort for the vast desert which encircles it for hundreds of miles. Already 150 miles of railway carry many tourists north from El Paso to picturesque Cloudcroft from all parts of Texas, Arizona and New Mexico; when the scenic beauties of the place are more widely known, the place will become a Mecca for lovers of nature.

The forests consist of pines, firs and balsams, of many species and of great size, trees twenty-five feet in diameter being quite common.

In all there are about twenty-five townships of forested land, some of which is included in the Mescalero Indian reservation.

Saw mills are already at work devastating this little-known but beautiful forest area. The importance of preserving this watershed cannot be too strongly insisted upon and it is hoped that all friends of forestry will use their influence to this end.

ROBERT T. HILL.

October 19, 1901.

THE WORK OF THE BEAUFORT LABORATORY OF THE U. S. FISH COMMISSION.

UNDER the administration of the present commissioner, Hon. Geo. M. Bowers, the facilities for biological investigation at the Beaufort (N. C.) Laboratory of the U. S. Fish Commission are constantly increasing. During the past season the laboratory was open from the middle of May until the end of September, and every reasonable request for equipment was granted. Tables were occupied by the following gentlemen, grouped under the institutions with which they are connected: *Bryn Mawr College*, Professor T. H. Morgan. *Columbia University*, Professor E. B. Wilson, Mr. H. B. Torrey, Mr. J. C. Torrey. *Dartmouth College*, Dr. J. H. Gerould. *Johns Hopkins University*, Professor W. K. Brooks, Dr. Caswell Grave, Mr. R. P. Cowles, Mr. D. H. Tennent, Mr. O. C. Glaser, Mr. R. E. Coker, Mr. J. A. E. Eyster. *University of Alabama*, Professor J. Y. Graham. *University of Missouri*, Professor Geo. Lefevre, Dr. W. C. Curtis. *University of North Carolina*, Professor H. V. Wilson, Mr. C. A. Shore. *Washington and Jefferson College*, Professor Edwin Linton, Mr. C. W. Stone. The investigations carried on were of a varied character, embracing such diverse problems as the systematic zoology and natural history of parasites in edible fish; the effect on the tissues of the oyster of a prevalent trematode parasite; the nature of the food and the rate of growth of planted oysters; the cell-lineage and embryology of *Thalassema;* the embryology of *Chætopterus*, of the oyster, of *Ascidia*, of *Phoronis;* regeneration in *Phoronis;* the metamorphosis of echinids and ophiurans, of barnacles; the systematic zoology of tunicates, of sponges, of echinoderms; cell phenomena in the formation of organs in half and quarter larvæ of sea-urchins.

Many zoologists will be glad to hear that *Phoronis* (*P. architecta* Andrews) turns out to be very abundant at Beaufort. Mr. Cowles has found the form to be a tractable one, living easily in the laboratory and depositing eggs freely. Biologists who are occupied in the study of the fundamental morphogenetic activities of protoplasm will be interested to learn that the delicate striæ which have been described (Conn) as radiating from the surface of the *Thalassema* egg were found (by several observers) to be fine threads, which in places branch and anastomose. With a Zeiss 2 mm., such filaments may easily be seen over the surface of the egg after the formation of the egg membrane, and later over the free surfaces of the first blastomeres. The filaments give every evidence of being protoplasmic, and clearly belong in the category of the 'filose processes' discovered by Mrs. E. A. Andrews ('Spinning Activities of Protoplasm,' *Journ. Morphology*, VII., 2, 1897).