

Hickman replies in a long letter, which appeared in the *Times*, but his remarks refer more to alleged imperfections in American work and the value of protection than to the cause of competition. He asks what evidence exists of 'superior chemical research, technical education, etc.,' and says, "I deny the 'chemical research'" mentioned by Lord George Hamilton. Apparently Sir Alfred Hickman attaches no importance to such reports as those prepared for the University of Birmingham and the Manchester Technical Education Committee as to the position of technical education in the United States; and he can scarcely be familiar with American scientific and technical publications or he would not 'deny the chemical research' with so free a mind. It seems pretty clear, however, that the India Office official who wrote Lord George Hamilton's letter to Sir Alfred Hickman was not the one who expressed views about the chemistry at Coopers Hill and aided the efforts which have strangled the technical education of the officers of the Indian Public Works Department.—*Nature*.

#### CURRENT NOTES ON METEOROLOGY.

##### CANNON-FIRING TO PREVENT DAMAGE BY HAIL.

A MOST unfortunate report was recently made to the State Department by the United States Consul at Lyons, France. According to the summary of the report published in the daily papers, the consul states that great success has attended the experiment of firing cannon as a means of protecting orchards and vineyards from damage by hail, and goes on to say that cannon firing is now to be used in order to prevent or to lessen injury by frost. As Consular Reports are official documents, and are looked upon by most persons as authoritative, many inquiries naturally came in to the Department of Agriculture, in Washington, as to when the United States Government intended to adopt, or to experiment with, some such method of protection. It therefore became necessary that some official answer should be made to these inquiries, and by direction of the Secretary of Agriculture, the Chief of the Weather Bureau recently issued a statement to the press in

which he says that it is his conviction that "we have here to do with a popular delusion as remarkable as the belief in the effect of the moon on the weather. \* \* \* The great processes going on in the atmosphere are conducted on too large a scale to warrant any man or nation in attempting to control them. \* \* \* After the experience that this country has had during the past ten years with rain-makers, I am loth to believe that the bombardment of hailstorms will ever be practiced, or even attempted, in the United States, much less encouraged by the intelligent portion of the community. Every effort should be made to counteract the spread of the Italian delusion which has been imported into this country."

On this recently much-debated question as to the possibility of preventing hail by means of cannonading, Van der Linden, in *Ciel et Terre* for May 16 sums up the discussion about as follows: "We see, on the one side, many who believe in the new method; on the other side, sceptics and those who are opposed to the method are calling for clearly established facts before they commit themselves, one way or the other. Under the circumstances, it seems wisest to await further developments before forming an opinion."

##### CLIMATE OF MANILA.

METEOROLOGICAL data lately published by the Jesuit Observatory, at Manila, are based on pressure, temperature and humidity observations made during the years 1883-1898, and rainfall observations during 1865-1898. The normal temperatures, relative humidities and rainfall for each month follow:

	Temperature. Fahr.	Relative Humidity. Per cent.	Rainfall. Inches.
Jan.	77.0	77.7	1.193
Feb.	77.7	74.1	0.413
March	80.4	71.7	0.736
April	82.9	70.9	1.142
May	83.3	76.9	4.197
June	82.0	81.5	9.622
July	80.8	84.9	14.567
Aug.	80.8	84.4	13.866
Sept.	80.4	85.6	14.925
Oct.	80.4	82.6	7.536
Nov.	79.0	81.6	5.126
Dec.	77.4	80.7	2.134

## EQUINOXES AND STORM WINDS.

At the May meeting of the Royal Meteorological Society (London) Mr. Rupert T. Smith read a paper on 'The Periodicity of Cyclonic Winds,' which was a discussion of his own observations made in the neighborhood of Birmingham during the years 1874-1890. The equinoxes do not appear to be very stormy periods, but the greatest frequency and force of cyclonic winds occurs some two weeks before the spring equinox and some three weeks after the autumn equinox.

R. DEC. WARD.

*BIOLOGICAL SURVEY OF THE GREAT LAKES  
BY THE UNITED STATES FISH  
COMMISSION.*

THE United States Fish Commission will continue during the present summer the Biological Survey of the Great Lakes, inaugurated in 1898. The writer withdraws temporarily from the active management of the enterprise, and the Survey has been placed for the summer under the direction of Professor H. S. Jennings of the University of Michigan, and Professor Henry B. Ward of the University of Nebraska. Active work begins June 15.

Professor Ward, with an assistant, will continue the investigations on the plankton and plankton methods carried on during previous summers.

The remainder of the work, under the immediate charge of Dr. Jennings, will have headquarters at Put-in-Bay, Ohio, on Lake Erie, although the different investigations will be carried on at such points on the lakes as are most favorable. The following is a list of the investigators who will be at work, together with the lines of research which will be carried on:

Professor H. S. Jennings, of the University of Michigan: the movements and reactions of the plankton organisms.

Professor F. C. Newcombe, of the University of Michigan, in general charge of the botanical work: physiological investigations into the relations of the lake plants to the water and substratum.

Professor R. H. Pond, of the Maryland Agricultural College: the distribution of plants and soils at the west end of Lake Erie.

Professor Julia Snow, of Rockford College: the lake Algæ.

Professor S. O. Mast, of Hope College: the breeding habits of the sturgeon.

Mr. Raymond Pearl, of the University of Michigan: a statistical study of the races of whitefish and wall-eyed pike.

Mr. Leon J. Cole, of the University of Michigan: a study of the biology and feeding habits of the introduced carp, with especial reference to their supposed destruction of the eggs of other fish.

Professor Chas. Fordyce: systematic work on the Cladocera.

Mr. H. W. Graybill, of the University of Nebraska: the Echinorhynchi of the lake fish.

The University of Michigan cooperates with the Survey by allowing the use of its extensive library of the fresh-water fauna and of certain apparatus. The U. S. Fish Hatchery at Put-in-Bay will be fitted up as a working laboratory, and the steamer *Shearwater*, belonging to the Put-in-Bay station, will be employed in some of the investigations undertaken.

JACOB REIGHARD.

ANN ARBOR, MICH., June, 1901.

*THE JUBILEE OF THE UNIVERSITY OF  
GLASGOW.*

ONE of the most interesting events in connection with the recent celebration at Glasgow was Lord Kelvin's oration on James Watt and Sir Joseph Hooker's address in connection with the opening of the new botanical department.

As reported in the London *Times*, Lord Kelvin said:

"The name of James Watt was famous throughout the whole world, in every part of which his great work had conferred benefits on mankind in continually increasing volume up to the present day. It was fitting that the University of Glasgow, in this celebration of its ninth jubilee, should recollect with pride the privilege it happily exercised 145 years ago of lending a helping hand and giving a workshop within its walls to a young man of no University education, struggling to begin earning a livelihood as a mathematical instrument-maker, in whom was then discovered something of the genius destined for such great things in the future. In a note by Watt appended to Professor Robison's dissertation on steam engines, he said that his attention was first directed in