and other meteorological conditions have been very carefully investigated by eminent Japanese meteorologists. Japan has just established a new weather service in Korea and Manchuria, and is said to be intending to extend the service to southern China. These are all for immediate practical daily forecasts; but the exploration of the free upper atmosphere by balloons and kites has not been touched. This vast upper ocean of atmosphere, the study of which is exceedingly important for further advances in the physics of the atmosphere, as well as in the prediction of the weather, must remain entirely unknown to Japanese meteorologists until they are able to investigate it.

Japanese meteorologists do not generally possess all the expensive instruments and apparatus that are found in the United States and Europe. In the whole of Japan there is probably not a complete set of modern apparatus for the study of atmospheric electricity, such as those of Elster and Geitel, Ebert, Benndorf or Gerdien. Japanese physicists and meteorologists have relied on their own hands and brains, but we have now come to the age when international cooperation in science is progressing rapidly and our scientists should be provided with laboratories and observatories containing powerful instruments and apparatus. It is sad, indeed, to hear from Japanese meteorologists that they have no hope of establishing an aero-physical observatory similar to those mentioned above.

I have been asked if I can induce some worthy American patron of science or some institution to establish an aero-physical observatory in Japan, or somewhere on the other side of the globe. What we should want at first would not necessarily be a great observatory, such as Mount Weather, but a small one, or several such, where we can observe with kites the conditions of the upper atmosphere, and can also study the atmospheric electrical phenomena by using the Ebert, Elster and Geitel and Benndorf apparatus. Such work is entirely new in Japan, but good physical assistants and materials can be obtained at small cost. It will require comparatively a small sum of money to establish and maintain such an observatory in Japan.

All Americans remember gratefully that the Smithsonian Institution, of Washington, which has done wonderful service for the increase and diffusion of scientific knowledge in America, was founded by a foreigner, an Englishman, James Smithson, in the beginning of the nineteenth century. May not Japan receive similar encouragement from foreign countries or institutions? Scientific research is becoming more and more international and cooperative; it soars far above the differences of race and national policy. The results of the meteorological investigations that are carried on in an aero-physical observatory in Japan will be directly beneficial to the whole human race as well as to that country. The world's meteorology will receive far greater benefits indirectly than will Japan directly. Our atmosphere must be studied as a unit. When the atmospheric conditions in the upper and the lower strata become thoroughly known over America, Europe and Asia, then, and only then, can meteorologists establish the true theories of cyclones, anticyclones, floods and droughts on a firm observational basis. We must remember, however, that at present the atmospheric conditions in the upper atmosphere over the eastern hemisphere of the globe are entirely unknown, and the final solution of our complex aero-physical and dynamical problem is still far away.

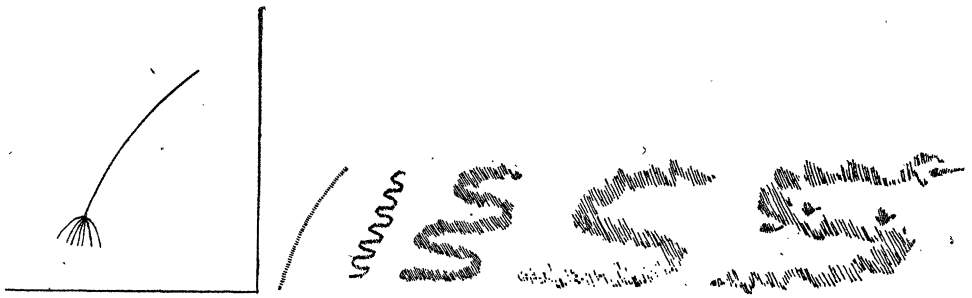
All nations send their naval and merchant vessels to Japanese ports, where we do our best to forewarn them of dangerous storms. A storm-warning service blesses all nations alike. Its signals represent an international cooperation for the benefit of all mankind.

For these reasons I appeal confidently to the American patrons of science for the funds necessary to establish a modern aero-physical observatory in Japan.

S. T. Tamura.

AN UNUSUAL METEOR.

To the Editor of Science: The recent descent of a meteor and its resultant impressed me as being so unusual and interesting that I am prompted to write about it.



At 5:30 P.M., October 13, 1905, shortly after leaving Cortland, N. Y., on a Lehigh Valley train for Elmira, N. Y., I observed to the south or southwest a meteor of great brilliancy. Its first appearance was about thirty degrees from the zenith and descended very rapidly in an arc to about the same distance from the horizon, when it burst like a sky-rocket. It left a narrow, smoky trail, which gradually increased in size and changed in form to a zigzag, becoming more cloud-like in appearance and growing fainter and fainter until it was entirely dissipated. The smoky trail in its transition was distinctly visible for ten minutes. The sketches indicate its gradual transition.

E. E. DAVIS.

NORWICH, N. Y.

SPECIAL ARTICLES.

ON THE OCCURRENCE OF DESMOSTYLUS, MARSH.

THE genus *Desmostylus* was described by Marsh[1] in 1888 from tooth fragments found in Alameda County, California. It was referred to the Sirenia, and its nearest affinities were supposed to be with *Metaxytherium* from the Tertiary of Europe. In 1899 and 1900 additional specimens were examined by the writer, with a view to obtaining further information as to its affinities, but no material was obtained which furnished more evidence than the type specimens described by Marsh.

In 1902 Yoshiwara and Iwasiki[2] described from the Miocene of Japan a number of specimens showing tooth structure almost identical with that of *Desmostylus*. This material also furnished considerable evidence concerning the structure of the skull. The authors recognized the resemblances of this form to the Sirenia.

Shortly after the appearance of the paper on the Japanese specimens a review of this article was published by Professor H. F. Osborn,[3] who included a short note on recent studies of *Desmostylus* by Merriam. Professor Osborn considered the reference of the animal somewhat uncertain, very properly pointing out that both sirenian and proboscidean characters were represented.

During the past year two occurrences of *Desmostylus* have come to the notice of the writer. In both cases the reference of the specimens to this form seemed beyond question, and in both instances the occurrence furnished evidence of considerable importance regarding the possible habitat of the animals. The first specimen, consisting of two well-preserved columns of a large *Desmostylus* tooth, came into my hands through the kindness of Professor Andrew C. Lawson. It was obtained by Professor Lawson from Mr. W. L. Still, of La Panza, San Luis Obispo County, Calif. It was found in a cultivated field on Mr. Still's ranch. This locality is stated by Professor Lawson to be in a belt of Monterey shale which extends through this part of the country for many miles.

The second lot of material, including numerous tooth fragments, was presented to the university by Mr. C. H. McCharles, of the University of California. It was obtained from a belt of shale six miles northeast of Santa Ana, Orange County, California, and

[1] *Am. Jour. Sci.*, 1888, p. 94.

[2] *Jour. of the Coll. of Science*, Imperial Univ. of Tokyo, Vol. 16, Art. 6, 1902.

[3] SCIENCE, N. S., Vol. XVI., p. 713.