States and other universities should be framed by joint representatives of all our universities.

It would be a misfortune if anything in the nature of competitive schemes for attracting students were to be evolved independently by different university authorities. J. B. COHEN.

Leeds, December 23.

The Deterioration of the Atmosphere in the Swiss Alps.

DR. MAURER, Director of the Swiss Federal Meteorological Service, sends a further communication about the deterioration of the atmosphere of the Swiss Alps, referring to Prof. Riccò's letter in NATURE of November 9 on the occurrence of an eruption at Stromboli. I am forwarding a translation for your information.

NAPIER SHAW.

Meteorological Office, South Kensington, London, S.W., December 11.

This remarkable optical deterioration of the atmosphere was visible here (Zurich) until about the middle of November. The thin, cirrus-like layer could be seen on clear mornings just before sunrise at a height of about 14-15 km. above the earth's surface, according to our reckoning—that is to say, it was situated considerably above the usual cirrus region. It consisted of thin horizontal bands, extremely delicate and soft, which soon disappeared after sunrise. A curious fact was that no appreciable effect, either actinometric or photometric, was produced by this thin, mist-like layer. The impression made was that of a most delicate, comet-like veil of mist, yet not dimming the starlight. After sunrise absolutely nothing was to be seen of the phenomenon, in spite of the keenest observation through field-glasses of a weak magnifying power. Synchronising with this remarkable phenomenon, the sun had a large aureole with a diameter of 100°. Here and there the extreme outer edge of this ring was of a pale brown colour. So far we have not been able to offer any explanation as to the cause.

During the period of maximum visibility of the thin veil (twilight cirrus), such a conspicuous layer was to be seen in the eastern sky, shortly before sunrise and at a height of 40°, that even an unskilled observer would have noticed it at once. The structure of the layer was often so regular and definite in its remarkable horizontal stratification that it looked as though an artist with a coarse brush had coloured the whole eastern sky with long horizontal strokes not too neatly laid on.

Each time this peculiar veil of "twilight cirrus" reached a maximum of intensity we had a colourless morning twilight with interrupted "purple light." What can be the cause of all these remarkable phenomena?

Winter Thunderstorms.

A YEAR ago (December 16, 1915) I asked readers of NATURE if they would let me know when they observed thunder or lightning during the first three months of the year. I made a similar request to the observers of the British Rainfall Organisation. The number of replies I received amounted to nearly one thousand, and the rather remarkable fact came to light that during the period in question thunder or lightning occurred somewhere in the British Isles on sixty-four out of the ninety-one days. So numerous were the replies received that I was unable to answer each one personally, but I wish to thank those correspondents who kindly sent information, and to assure them that every report was of value.

The information obtained last winter was so remarkable, and the number of days on which thunder or lightning occurred so unexpected, that I am anxious to collect information again. Readers of NATURE could assist if they would send me a note by postcard or letter if they observe thunder or lightning between January 1 and March 31, 1917. The following points are of interest:—(1) Time when storm was nearest or overhead; (2) direction of storm when first observed, and time; (3) direction when last observed, and time; (4) note if there was a change of wind during the storm and if there was a drop in temperature; (5) any other information as to heavy rain, hail, snow, or any remarkable feature; (6) if an observer has accurate time, a list of the times of occurrence of flashes would be useful.

Many observers may not have the time or opportunity to record all these points, but I should be grateful for information on even one of them; No. 1 is the most important. The information is of real value, and every record, however short, is of use.

C. J. P. CAVE.

Meteorological Office, South Farnborough, December 20.

GRAVITATION AND THE PRINCIPLE OF RELATIVITY.

ACCORDING to the principle of relativity in its most extended sense, the space and time of physics are merely a mental scaffolding in which for our own convenience we locate the observable phenomena of Nature. Phenomena are conditioned by other phenomena according to certain laws, but not by the space-time scaffolding, which does not exist outside our brains. As usually expressed, the laws of motion and of electrodynamics presuppose some particular measurement of space and time; but, if the principle is true, the real laws connecting phenomena must be independent of our framework of reference—the same for all systems of co-ordinates. Of course, it may be that phenomena are conditioned by something outside observation—a substantial æther which plays the part of an absolute frame of reference. But the following considerations may show that the ideal of relativity is not unreasonable. Every observation consists of a determination of coincidence in space or time. This is sufficently obvious in laboratory experiments; and even the crudest visual observation resolves itself into the coincidence of a light-wave with an element of the human retina. If, then, we trace the path of adventure of a material particle, it intersects in succession the paths of other particles or light-waves, and these intersections or coincidences constitute the observable phenomena. We can represent the course of Nature by drawing the paths of the different particles—on a sheet of paper in a two-dimensional case. The essential part of the diagram is the order of the intersections; the paths between the intersections are outside observation altogether, and are merely interpolated. The sequence of phenomena will not be altered if the paper is made elastic and deformed in any way, because the serial order of the intersections is preserved. This deformation of the paper corresponds to a mathematical transformation of the space in which for convenience we have located the phenomena.