Astronomischer Jahresbericht. Vol. ix. Pp. xxxv+653. (Berlin: Georg Reimer, 1908.) Price 21 marks.

WE are glad to direct attention to the ninth issue of this very valuable compilation, which is of great utility to all those who study astronomy, and by this time should have found its place in every observatory. The high standard has been thoroughly maintained, and the fact that the present volume is made up of 653 pages gives some idea of the quantity of material which has been dealt with. It may be mentioned, for the information of those who are not familiar with the previous annual volumes, that, in addition to the references to all the more important astronomical publications during the past year, a concise and accurate abstract of each research in question is given in nearly every case.

The importance of having such an abstract is obvious, for it enables the reader to become acquainted at once with the pith of the work described, and saves him probably much time and trouble, if he had had to procure the original work from a library and found that it did not contain the kind of information he was desirous of obtaining. There is no doubt that the compilation of such a volume as this involves strenuous labour on the part of those who bring this information together, and the least astronomers can do is to see that such an undertaking is not brought to an end by inadequate support on their side. W. J. S. L.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

The Crystallisation of Over-cooled Water.

IN order to show the over-cooling of water and to allow the free development of its crystals, I endeavoured to introduce in the over-cooled water a piece of ice put in a finely drawn-out glass tube. The experiment, carried out the first time by Mr. Michael Iwanow, gave an unexpected result; when the crystallisation reached the end of the tube, an ice-crystal having the shape of a hexagonal star, and

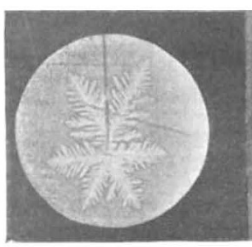

FIG. 1.

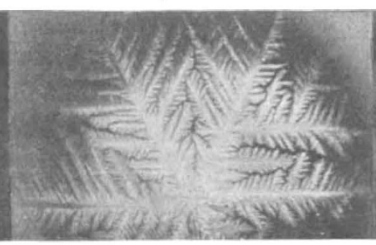

FIG. 2.

FIG. 3.

very similar to the characteristic snow-crystals at this point, began to grow.

The greater the over-cooling of water the greater were the abundance of ramifications and the velocity of crystallisation. With water over-cooled to a temperature between $-0°.3$ and $-1°$ I obtained small stars (Fig. 1) with few narrow ramifications. The over-cooling to a temperature between $-1°$ and $-3°$ gave rise to stars with so densely developed ramifications that they resembled hexagonal plates (Fig. 2). The plane of stars contains the direction of the end of the tube, and therefore when this end is vertical a sufficiently large plate can divide the vessel in two parts. An over-cooling greater than to $-3°$—especially when the end of the tube is not narrow enough—produces several plates set in different azimuths, and the whole mass becomes at last a mixture of differently sized crystals and water, resembling the so-called "anchor-ice."

The crystals are often a conglomeration of several stars which have their planes, their principal rays, and even the ramifications of higher order parallel (Fig. 3).

When a star is broken the pieces of it rise horizontally in the water with slight oscillations and attain in such position the surface. This circumstance can explain the verticality of optic axis of river- and lake-ice.

The evolution of these artificial snow-crystals can be easily projected on a screen if the vessel with over-cooled water (a tumbler or an evaporating dish) be put into another vessel with plane-parallel sides containing water of a temperature somewhat higher than the thaw-temperature of the surrounding air. Any water will serve for over-cooling, but the refrigerating mixture (finely chopped ice upon which is poured a strong solution of NaCl) must not be too cold (from $-4°$ to $-6°$), and its level must be lower than the level of the water which is to be over-cooled.

The projection is especially beautiful when the vessel is placed between two crossed Nicols (the photographs of Figs. 1–3 are taken in this way); on a dark ground grows a star, which gradually becomes more and more white, and at last—when thick enough (the thickness is generally of the order of a tenth of a millimetre)—obtains the colours of chromatic polarisation. It is easy to prove that these crystals are optically uniaxial, the tube being turned so long that the plane of a star is at right angles to the rays of polarised light, the image of the star disappears.

Precise measurements of these crystals are to be made in winter, when it will be possible to prolong their fugitive existence. The size of the stars depends—at a sufficient over-cooling, *e.g.* of $-2°$—principally on the dimensions of the vessel with over-cooled water; I often obtained single stars 8 cm. to 12 cm. broad. BORIS WEINBERG.

St. Petersburg, July.

Bright Meteors on August 19.

ON August 19 there was an unusual display of three bright meteors within about five minutes. The details were recorded here as under:—

h. m.				sec.		Radiant
9 40>1	... 220+66	... 202+62	...	1·8	...	288+59
9 44 1	... 355+79½	... 283+70	...	1·0	...	56+60
9 45	... 269+ 9½	... 256+15½	...	2·0	...	320−15

The first was one of the *o* Draconids, the second a belated Perseid, the third a δ Capricornid. The Perseid was well observed, and it would be interesting to obtain a duplicate record of it.

W. F. DENNING.

Bristol, August 20.

Barisal Guns in Western Australia.

I HAVE just received the following note from Mr. H. L. Richardson, Hillsprings Station, 100 miles north-east of Carnarvon, on our west coast:—

"A peculiar incident happened here last evening (June 26) about an hour after sunset. In a south-easterly direction from here three reports took place high up in the air, and then a rushing noise like steam escaping, lasting for a few seconds, and gradually dying away. Mr. Loeffler, one of the owners of this station, was standing outside with me at the time. It was a beautifully clear evening, and there was nothing visible at all in that direction. The reports sounded like explosions of some combustible to which there was no resistance."

W. E. COOKE.

Perth Observatory, Western Australia, July 20.