the surface. The spectacle was so awe inspiring that the dog team was stopped and I sat upon the sled for more than an hour absorbing the marvelous beauty of this most unusual display. As we sat upon the sled and the great beams passed directly over our heads they emitted a distinctly audible sound which resembled the crackling of steam escaping from a small jet. Possibly the sound would bear a closer resemblance to the cracking sound produced by spraying fine jets of water on a very hot surface of metal. Each streamer or beam of light passed overhead with a rather accurate uniformity of duration. By count it was estimated to require six to eight seconds for a projected beam to pass, while the continuous beam would often emit the sound for a minute or more. This particular display was so brilliant that traces could easily be seen long after daylight.

CLARK M. GARBER

PROFESSOR EINSTEIN AND THE INSTITUTE FOR ADVANCED STUDY

THE statement in your issue of August 18 that Professor Albert Einstein will "spend the *winter half-year* conducting his scientific work at the Institute for Advanced Study" will not be understood in this country, inasmuch as the terminology, "winter half-year," is, as far as I know, not employed in America. The academic year of the Institute for Advanced Study starts at the beginning of October and ends at the beginning of May with an intermission at Christmas. It covers therefore autumn, winter and a part of the spring. On account of a previous commitment to the University of Oxford, Professor Einstein's arrangement with the institute permits him to terminate his work annually at Princeton a fortnight earlier than his associates.

ABRAHAM FLEXNER

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A METHOD FOR PERMANENTLY RECORDING THE LOCATIONS OF OBJECTS ON MICROSCOPE SLIDES[1]

MICROSCOPISTS have often felt the need for a method of locating objects on a slide so that they might be found quickly at any time on any microscope. The Maltwood finder, used many years ago, was a step in this direction, but was somewhat awkward to use, particularly if many objects were to be located, and was unsatisfactory when they were very small. Since nearly all modern research microscopes are fitted with graduated mechanical stages, the method of locating objects on a slide by recording their coordinates has become increasingly popular. As ordinarily applied it is open to the following objections:

(1) Objects located with one objective are difficult to find if another objective is used on a revolving nosepiece.

(2) Any shifting of the position of the optic axis with reference to the coordinate system of the mechanical stage likewise shifts the position of all objects recorded in terms of this coordinate system with respect to the optic axis. This shifting may be caused by a faulty revolving nosepiece, by unscrewing and replacing an objective, by an accidental decentering of a centerable revolving stage, or by an accidental decentering of a centerable objective changer.

(3) Objects located on one microscope can not be found easily and definitely when a different microscope is used.

The first two objections can be overcome by employing centerable objective changers, keeping them accurately centered by frequent checking and by frequently checking the centering of the revolving stage. The method here described offers a means of overcoming the third objection.

After a slide has been labeled and numbered, a small cross is made on it with a writing diamond about 2 mm outside the lower left-hand corner of the cover glass. A filing card is provided (4 by 6 inches is a convenient size) for each slide which bears the same serial number and other data pertaining to the slide. On this card the coordinates of objects of interest are recorded as well as the coordinates of the cross. The objects and the cross are thus permanently recorded in terms of the same rectangular coordinate system. By subtracting the coordinates of the cross from those of the objects, the cross becomes the origin of a system of rectangular coordinates, and the differences become the (x', y') of each object. If the slide is placed upon the mechanical stage of another microscope, the coordinates of the cross become a new origin of a second rectangular coordinate system. Adding the above differences (x', y') to the coordinates of this new origin gives the coordinates of the point (x'', y'') on the second microscope. By setting the mechanical stage to these coordinates (x'', y'') the object is found easily.

Difficulty may be experienced when one or both of the scales on one microscope run in opposite directions from those on the other microscope. In this event the differences (x', y') are treated in an opposite manner to the way they would be if the respective scales increased in the same direction; that is, the differences (x', y') are subtracted from the coordinates of the

[1] Published by permission of the director of the U. S. Geological Survey.