glass shade is also employed for steadying the light, by keeping off convection currents. There seems to be an objection to this form of lamp for accurate scientific work, where it may be necessary to use an *image* of the source of illumination. For instance, in certain spectroscopic comparisons of different lights only a small portion of the image of the incandescent platinum would fall upon the slit. Now the first difficulty that would be met with would be as to the part of the platinum that would emit a standard light. Near the contacts the heat would be conducted away so rapidly that the colour of the light would be of a different tint.

Again, presumably near the middle of the limbs of the U-shaped foil the temperature would be slightly higher than at the outsides; in fact, no two portions of the foil would be exactly at the same temperature.

For work, then, of this class, the standard seems to fail in an important particular.

The writer of this notice made many experiments on this point some years ago, and it was this objection that led him to abandon the idea of a platinum standard light of a form somewhat similar to that of Mr. Schwendler.

For a standard perfectly suited to scientific work, perhaps the following definition will be found tolerably exact:—It should be a body (solid or liquid), some known area of the surface of which can be kept at a high constant temperature. It seems probable that a combination of a body of good with one of a bad conductivity will eventually be found to offer suitable materials for a really trustworthy standard.

It would be unjust to conclude this notice without paying a testimony to the great value of the experiments which have been carried out by Mr. Schwendler in this research. It is quite possible that a modification of his platinum standard may be constructed which will eliminate the defects which are to be found in it. It is certainly a step in advance of the gas or candle standard for everything beyond merely technical work, but it is not of the same accuracy as other scientific units. W. A.

FLOW OF VISCOUS MATERIALS—A MODEL GLACIER

THREE or four years ago an experiment was arranged by Mr. D. Macfarlane and myself for the purpose of showing the flow of a viscous mass and for illustrating glacier motion. The experiment then commenced gave rise to others of a similar nature. These experiments have proved so interesting that I venture to describe some of them to the readers of NATURE.

Shortly after his discovery of the true nature of glacier motion, the late Principal Forbes was much pleased when one of his students, now the Rev. C. Watson, of Largs, showed him a quantity of shoemakers' wax which had been gradually flowing down on the bottom of a vessel accidentally left on an incline. Forbes was delighted with the wax, and considered it an admirable illustration of viscous flow. This was told to me in conversation some four years ago, and it occurred to me that a pretty illustrative glacier might be made with shoemakers' wax, and we proceeded to construct it. The model glacier has been shown year after year to the natural philosophy class in Glasgow, and has proved interesting and instructive beyond expectation.

A little wooden ravine was constructed, with a number of steep declivities and precipices and some more gentle slopes. There is one place, also, where the ravine is narrowed by projections inwards, which nearly meet each other. At the upper end of the ravine there is a flat part, on which ordinary shoemakers' wax is piled—as where snow collects at the upper end of the natural ravine; and from this collecting-ground the material flows down steadily through the ravine, giving on a small scale a most perfect display of the flow of a semi-solid material. At the beginning of each winter session a supply of shoemakers' wax is given at the top, and during the session the flow goes on slowly and steadily; hardly perceptible from day to day, but progressing from week to week, and from month to month. Every one knows what a brittle substance shoemakers' wax is at ordinary temperatures. A lump of it allowed to fall on the ground flies into a thousand pieces. Watching this brittle apparent solid flowing down an inclined plane, brings very vividly before the mind the real nature of the glacier's flow. To imitate on the small scale Forbes's celebrated experiment of planting a row of stakes in the glacier, in order to compare the flow in the middle with the flow at the edges—the experiment which really established the fact of *viscous* flow—I have sometimes put a row of dots of white paint across our pitchy glacier. In a few days the more rapid motion of the middle portion, and the less rapid motion of the parts near the edges, is made apparent. There are others of the glacier phenomena which are also beautifully imitated by the shoemakers' wax. Little crevasses are sometimes formed, though not very often owing to the great effect of temperature on the plasticity of the material; and the cross-markings that are noticeable at the foot of a glacier are brought out extremely well.

Last year Sir William Thomson commenced a new and curious experiment on shoemakers' wax as a viscous material. A large circular cake of it about eighteen inches across and three inches thick was made. This was put into a shallow cylindrical glass vessel, which was filled with water to keep the temperature from varying with any great degree of rapidity. Below the cake a number of corks were put, and on the top there were put some lead bullets. The result has been that in a year the corks have floated up through the wax, and are coming out at the top; the bullets have sunk down through the wax, and have come out at the bottom; and this, it is to be observed, has gone on while the wax was at all times in such a condition as to be excessively brittle to any force suddenly applied, such as a blow from a hammer, or such as would be occasioned were the cake of wax to be allowed to fall on a stone floor. J. T. BOTTOMLEY

THE SCOTTISH ZOOLOGICAL STATION

SOME months ago the opening of a zoological station on the Scottish coast was mentioned in these pages. This station—the first enterprise of the sort in Britain—has been established in connection with the University of Aberdeen, and under the directorship of the Professor of Natural History, Dr. Ewart, who was, this year, assisted in the conduct of the station by Mr. Patrick Geddes.

The site chosen was the little fishing station of Cowie, about half a mile north of Stonehaven, and fifteen miles south of Aberdeen. But one of the chief advantages of the station is that it is not a fixed building of brick or stone, but a movable one of wood, which can be taken, if necessary, to a new place every year, and, after the season's work, taken down and packed up for the winter.

The annexed cuts give an excellent notion of the appearance and internal arrangements of the place. It is a wooden structure (Fig. 1) about 32 feet long by 16 wide, supported on low wooden piers and having a thin wooden roof covered over with sailcloth. In each of the longer sides are five windows, in one of the shorter sides the door, in the other two windows. Inside (Fig. 2), a partition divides the building into two parts—a larger, the laboratory proper, with eight out of the ten side windows, and a smaller, the library and director's room, with two of the side and both end windows.

In the library there is a bench or working-table (Fig. 2, *T*) running round three sides, with shelves (*S*) above, for books, apparatus, and bottles. In the laboratory there is a table (*T*) to each window, intended to accommodate two