through the Royal Society Range is to a large degree answered by what I call the "palimpsest theory" (v., p. 175). In effect the outlet glaciers flow down notches cut by earlier headward (or cwm) erosion. I hope to publish shortly a mass of evidence and illustration in support of this sequence in glacial erosion.

GRIFFITH TAYLOR.

Meteorological Bureau, Melbourne, July 26.

Muret Sanders's "Encyclopädisches Wörterbuch" gives "riegel," in addition to the various ordinary meanings of the word "bar," including a bar of soap, eleven other meanings. What advantage is there in the use of a German term over an English term when both have equally varied meanings? The term "riegel" is especially overloaded, as in geography, according to Grimm's "Deutsches Wörterbuch," it is used in South Germany for a "kleine Anhöhe, steiler Absatz eines Berges," and he also quotes its use for a watershed.

Ordinary water erosion would certainly produce a slope with catenary curves if it is operating on suitable rock and under suitable conditions.

The conclusion that the *Discovery* Hut was not erected as designed was not based only on Dr. Taylor's photograph, and there could have been no difficulty in managing the supports on any surface of ice which had not so steep a slope as to be otherwise unsuitable.

The more detailed information regarding the origin of the glacier valleys which Dr. Taylor obviously collected may, as was remarked in the review, explain their origin. Dr. Taylor's further publication will be awaited with interest. THE REVIEWER.

ANNEALING GLASS.

EVERYONE who makes chemical apparatus by blowing glass practises annealing in a rude way by allowing the glass to cool slowly by gradual removal from the flame, or by the use of a smoky flame. In glass works more systematic annealing is effected by slow passage through a long chamber wherein the temperature falls from the incoming to the outgoing end. In the manufacture of optical glass of many different qualities the question of annealing is one of the first importance, as they differ so much in fusibility. Messrs. Hilger have after a careful investigation found the means of arriving at the maximum temperature necessary, and also the necessary rate of cooling, which may progressively become more rapid. Optical glasses may differ as much as 200° C. in the maximum necessary temperature, which temperature may be a long way below any visible softening point. It is desirable not to exceed the necessary temperature, as the very slow cooling at the higher temperature leads to great loss of time.

The method adopted by Messrs. Hilger for testing different specimens of glass is interesting as an example of a physical investigation made with a view to practically useful results. The principle of the method can be described very shortly. Fig. 1 shows a bar of glass supported as a cantilever, and carrying a load. Its edges are ground and polished in the form of two parallel planes. This is set up in an electrically heated muffle, with means for observing the temperature electrically. Polarised light broken up into interference bands by passage through a Babinet's compensator is passed through the glass, and when this is loaded the bands become inclined as shown in the figure, illustrating how perfectly the stress, whether of compression or extension, is proportional to the distance from the neutral axis. If the load is allowed to rest on a support in consequence of the slight yielding of the glass, the rate at which the bands change from the inclined to the straight position can be observed for any known tempera-

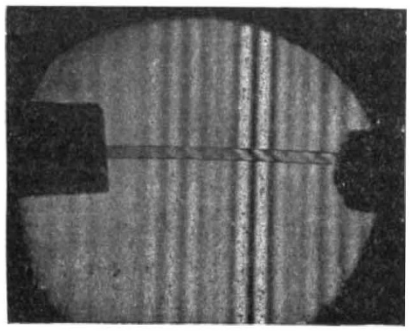

FIG. 1.

ture. Fig. 2 shows two specimens undergoing a change of temperature which sets up strains from the difference in temperature between the interior and the exterior. That the two specimens are very different is only too apparent.

By watching the bands in specimens of glass Messrs. Hilger are able to ascertain when the glass is hot enough to allow the internal strains to be relieved in a convenient time, and whether as the glass cools internal strains are avoided by

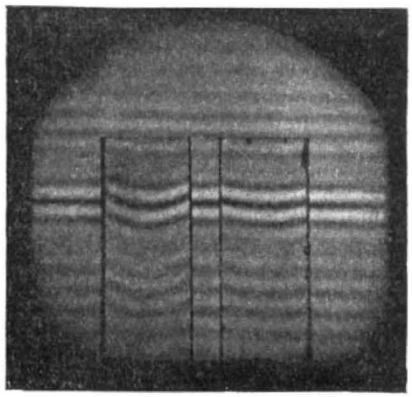

FIG. 2.

sufficiently slow cooling. After a point is reached at which the glass has lost all viscosity the cooling may be accelerated, and though the bands then become curved they straighten out again when ultimately the temperature is equalised. There is no hard-and-fast point at which the glass ceases to be viscous, and so there is a progressive permissible increase in the rate of cooling. Messrs. Hilger have thus shown how annealing may be effected perfectly in the minimum of time. Though