by simple pressure; and later Daubrée, who experimented with clay and scales of mica, obtained a perfect schistose structure. The rolling and hammering of metals result in a laminated texture, which fracturing or acids may reveal, when not otherwise visible; and several fine examples are figured by Daubrée in his excellent work on Experimental Geology.

Mountain-making was going forward, and the work done was therefore on a large scale, producing at one effort slaty structure over areas of hundreds of square miles, with great uniformity of direction and high angle of pitch. Sedgwick recognized the approximate coincidence of the strike of the slates with the strike of the beds, or rather, as Professor Phillips stated it, with the direction of the main axis of elevation. The uniformity of product and evenness of surface are a consequence of the fineness and evenness of grains of the original argillaceous formation, and the regularity of the long-continued pressure; but partly also of the moderate degree of heat during the action of the pressure.

Further: pressure has been proved to have produced a foliated, and even a schistose, structure in the granite-like rock, of igneous origin, called granulyte, and also in augitic and other igneous rocks.

A slaty formation often contains fossils, and these indicate, to some extent, the degree of compression and distortion which the beds containing them underwent under the pressure. The fossils in Fig. 344 are from a paper on slaty cleavage. This subject has been treated mathematically by Professor Haughton (1846, 1857); and more recently by A. Harker (British Association, 1885).

Slaty cleavage, or that characterizing roofing slates, passes gradually into the foliation of hydromica schist and mica schist, and thence into that of gneiss and gneissoid granite, suggesting that the latter *may* be due in these rocks to *pressure*. This has been confirmed by experiment and observation. But geological observation is required to settle any doubts that arise, rather than the microscope. In general, the foliation of mica schist and gneiss is not a result of pressure, but, on the contrary, of the original bedding of the formation. The evidence of this often appears in the occurrence of large variations in strike and dip in the planes of foliation, instead of the high angle and evenness characterizing slates; in flexures of the sheets of rock, anticlinal or synclinal; and in alternations of the sheets with those of limestone or other kinds of rock, such alternations in connection with low dips or flexures being good evidence that the sheets are true beds. Only the finer kinds of metamorphic rocks — argillyte and hydromica schist — often lose their bedding by the substitution of the cleavage structure through pressure.

4. *Joints.* — *Joints* in rocks (see page 111) have various methods of origin. They are in part due to slow-acting pressure on the outskirts of a region of disturbance. The pressure may act with little or no warping of the beds. That this is often the case is indicated by the general parallelism in the joints. But in other cases warping or torsion is strongly marked, as Daubrée has shown. Daubrée has illustrated the effects of torsion on the courses of joints by subjecting plates of ice to the action. He obtained, as one of his results, with a plate nearly a yard long, the fractures shown on a much reduced scale in Fig. 345. Fig. 346 shows a portion of one of the plates one fourth of the natural size. (It is from a photograph, and hence