

tinguishable by the unaided eye are denoted either by ordinary descriptive adjectives, or by terms derived from rocks in which the special structures are characteristically developed, such as granitoid, brecciated, shaly. It must be borne in mind, however, that the external character of a rock does not always supply us with its true internal structure, which may be gained only by microscopic examination. This is of course more especially true of the close-grained kinds, where to the naked eye no definite structure is discernible. Some of the definitions originally founded on external appearance have been considerably modified by microscopic investigation. Many compact rocks, for instance, have been proved to be wholly crystalline.

The same rock-mass may show very different structures and textures in different parts of its extent. This is true alike of sedimentary and igneous materials. It may be observed even in the several portions of one continuous mass of erupted rock—variations in the rate of cooling, in temperature, and other circumstances have combined to produce sometimes the most extraordinary textural and even structural, as well as chemical and mineralogical contrasts in a boss or sheet of igneous rock.<sup>60</sup> Hence the student must be on his guard against concluding that two portions of rock strikingly unlike each other in outward appearance cannot be portions of one original continuous mass.

---

such as can be judged of in hand specimens. M. De Lapparent makes a similar distinction (*Traité*, p. 602, note). But the practice of using the word structure as it is employed above in the text, has received such a support from the petrographers of Germany that though I still think it would be preferable to distinguish between *texture* and *structure*, I have adopted what has now the sanction of common usage.

<sup>60</sup> See Book IV. Part VII.; G. F. Becker, *Amer. Journ. Sci.* xxxiii. (1887), p. 50. J. H. L. Vogt, *Geol. Fören. Förhand.* Stockholm, xiii. (1891).