

weather for an enormously longer time than even the oldest of human erections.

This kind of decay is briefly described as "weathering." It is a complex process, however, or rather a series of processes, depending on the one hand upon the relative efficiency of changes of temperature, wind, rain, and frost; on the other hand, upon the composition and texture of the stone itself. Apart from the problem of the nature of the change lies the question of its rate. Actual time-measures are as yet so few in geological inquiry that any attempt may be welcomed which promises to supply one. The rate of weathering of rocks appears to be a question in which precise measurement should not be by any means unattainable. Comparatively little, however, has yet been done to determine with precision or even approximately, the rate at which the exposed surfaces of different kinds of rock decay. A few years ago, some experiments were instituted by Professor Pfaff of Erlangen to obtain more definite information on this subject.¹ He exposed to ordinary atmospheric influences carefully measured and weighed pieces of Solenhofen limestone, syenite, granite (both rough and polished), and bone. At the end of three years he found that the loss from the limestone was equivalent to the removal of a uniform layer 0.04 mm. in thickness from its general surface. The stone had become quite dull and earthy, while on parts of its surface fine cracks and incipient exfoliation had appeared. The time during which the observations were continued was, however, too brief to allow any general deductions to be drawn from them as to the real average rate of disintegration. Professor Pfaff relates that during the period a severe hailstorm broke one of the plates of stone. An exceptionally powerful cause of this

¹ *Allgemeine Geologie als exacte Wissenschaft*, p. 317.