

some iron-oxide (magnetite chiefly), or some silicate rich in iron (as hornblende and augite). Many rocks (basalts and melaphyres particularly) which look quite black on a fresh surface, become red, brown or yellow on exposure, black being comparatively seldom a weathered color. *Yellow* (or *Orange*), as a dull earthy coloring matter, almost always indicates the presence of hydrated peroxide of iron. In modern volcanic districts it may be due to iron-chloride, sulphur, etc. Bright, metallic, gold-like yellow is usually that of iron-disulphide. *Brown* is the normal color of some carbonaceous rocks (lignite), and ferruginous deposits (bog-iron-ore, clay-ironstone, etc.). It very generally, on weathered surfaces, points to the oxidation and hydration of minerals containing iron. *Red*, in the vast majority of cases, is due to the presence of anhydrous peroxide of iron. This mineral gives dark blood-red to pale flesh-red tints. As it is liable, however, to hydration, these hues are often mixed with the brown, orange and yellow colors of limonite.⁷⁵ *Green*, as the prevailing tint of rocks, occurs among schists, when its presence is usually due to some of the hydrous magnesian silicates (chlorite, talc, serpentine). It appears also among massive rocks, especially those of older geological formations, where hornblende, olivine, or other silicates have been altered. Among the sedimentary rocks, it is principally due to ferrous silicate (as in glauconite). Carbonate of copper colors some rocks emerald- or verdigris-green. The mottled character so common among many stratified rocks is frequently traceable to unequal weathering, some portions of the iron being more oxidized than others; while some, on the other hand, become deoxidized

⁷⁵ See I. C. Russell, Bull. U. S. Geol. Surv. No. 52 (1889).