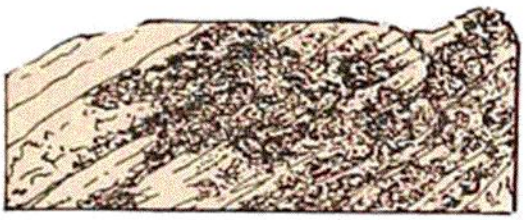
destructible mineral is a chief constituent become covered with a rusty crust which is ever encroaching inward; and this crust is slowly reduced to a rusty earth, having parted with all soluble ingredients; or, losing the rusting mineral, it finally falls to earth or sand. A porous granite or gneiss containing black mica may become deeply rusted, and finally reduced to a weak mass of quartz and unaltered feldspar, — good material for a granitic sandstone.

If marcasite or pyrite is present in any rock, there is not only oxidation, but corrosion from the sulphuric acid that may be formed, which attacks any lime present in the minerals of the rock, or any magnesia, or potash, or soda, or alumina, and makes sulphates with each. The aluminum sulphates are alums, but strictly so only when potash, soda, or some other base is also present. Some beds of shale containing iron sulphide are impregnated or interlaminated with alum which has been thereby made, the shale affording the alumina of the alum.

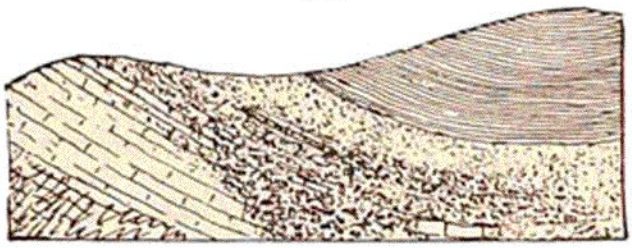
Limestones, even the whitest of marbles, often contain a trace of iron or of manganese in combination, and occasionally masses of the iron carbonate, siderite. The iron carbonate, unless in a massive state, readily oxidizes; and so also does the iron of the limestone on exposure for a few months; and this is a commencement of the change in the whole mass to limonite. The work in progress is illustrated by Fig. 132, representing an

132.



Impure limestone decaying to limonite.

133.



Same, with calciferous schist. D.

impure ferriferous limestone as it appears where the alteration is going on at the Amenia Ore-pit, N.Y., southwest of Salisbury, Conn.; and Fig. 133, the same, with the calciferous schist adjoining also changing. If one per cent of iron is present, a limestone will rust and decay; if as much manganese is present, it will become covered with black stains. The massive siderite changes slowly over the surface and in rifts.

Limonite — the yellow-brown oxide of iron, or yellow ocher — is the most common result of the oxidation; but hematite, of red-ocher color, is often produced in warm and rather dry climates. Nearly all red, yellow, and brown rocks, sand-beds, or earth-beds, owe their color to iron in one of these two forms.

Oxidation of the iron in pyroxene gives the yellow-brown fronts to trap bluffs — not their gray and black tints, which are due to lichens; and has spread delicate surface shades of red and yellow over sandstones in the Yellowstone Park, and other dry parts of the Rocky Mountains, through the oxidation of the little iron inside.