

*Algonkian formation.*—The Algonkian formation (Agnotozoic of Irving) is made by its describers to include the Huronian of Logan, north and south of the lakes, and some of the so-called Huronian in other regions. Its rocks (1) comprise the thinner schists, semi-crystalline slates, quartzites, and uncrystalline fragmental and shaly rocks; and (2) they are of pre-Cambrian age. The supplanting of the older name, Huronian, by the newer is not sustained by any rules of nomenclature. It has been given a wider range by including under it the Keweenaw copper-bearing sandstone formation, which lies unconformably on the Huronian, and this change of limit was one reason for the change of name.

T. B. Brooks first recognized the "Keweenawian" as a distinct system of rocks (1876); Irving called it Keweenawan. If Archæan instead of Paleozoic, it marks a Keweenawian period in the long Huronian era. The Keweenaw formation is without fossils, and hence is of uncertain age; but its relations appear to be probably Paleozoic, as explained beyond.

Some of the localities of Algonkian observed by Walcott are the following: (1) the tilted beds of quartzites and siliceous slates at the base of the Wasatch series, lying conformably beneath the Lower Cambrian; and (2) strata beneath the Cambrian in the Eureka District and elsewhere in Nevada, where there is the same conformability. The beds are described as very thick and as affording no fossils; but the conformability to the Cambrian suggests the query whether the beds are not lowest Cambrian. (3) At the base of the walls in Grand Cañon of the Colorado, lying unconformably beneath Upper Cambrian beds, upturned beds of sandstone, shale, and limestone, named by G. K. Gilbert, the Tonto group. The presence of fossils in some of the Tonto beds (including remains of a Stromatopod, a Trilobite, and a Hyolithes, and a Discina-like shell) shows that part, at least, of the Tonto group is not Algonkian, and renders it probable that all is Paleozoic. (4) In central Texas, Llano County, beneath Upper Cambrian strata and over the Archæan, a formation which is called the Llano group. (5) Part of the Huronian of southeastern Newfoundland, described by Murray, which Walcott states is unconformable to the overlying Olenellus beds. (6) Below the Potsdam series in the Adirondacks. These are some of the localities of the so-called Algonkian formation.

The facts respecting the Algonkian are reviewed in Van Hise's Report of 1892, mentioned above; also briefly, on some localities, in Walcott's Correlation of the Cambrian, *U. S. Geol. Survey*, Bulletin No. 81, 1891.

*Kinds of rocks.*—The more characteristic kinds of Archæan rocks are coarse granites; thick-bedded gneisses, especially hornblendic varieties, syenites, diorites, and pyroxenic varieties of these rocks; the granite-like rock of the basalt type, called gabbro; and each of these rocks under gneissic and thin-schistose varieties. Zircon-syenite is rather common. There are also chrysolite rocks and chrysolitic varieties of some of the above kinds; and with them, serpentine rocks, the serpentine being a result of the alteration of chrysolite or pyroxene and possibly of some other mineral containing magnesia.

Crystalline limestone (usually dolomite or magnesian limestone) is common in some regions; and it often contains large crystals of apatite (calcium phosphate) and the pale yellow mineral, chondrodite (a fluorine-bearing magnesium silicate), supposed to be peculiar to the Archæan, besides many other minerals.

There are also in the Laurentian series, but less abundantly, hornblende schist, mica schist, hydromica (or sericite) schist, chlorite schist, and quartzite.