contain more than 75% of quartz being uncommon. Locally re-
crystallization has produced very coarse grained varieties of these 
rocks, the quartz appearing in large sheets and bunches. But 
such are usually interbanded with layers in which much pyroxene 
is associated with the quartz.

Garnet is often a very abundant mineral in these rocks, though 
more abundant in the more feldspathic varieties than in those 
purely quartzose. Graphite is more apt to appear in the rusty-
weathering gneisses. In certain beds garnet becomes the predomi-
nant mineral, but these make small bulk in the series as a whole. 
Sillimanite is also found mainly in the quartzose gneisses, per-
haps specially in those rich in garnet. At times it is only spar-
ingly present as microscopic inclusions in the quartz, at other 
times it becomes quite abundant and is in larger needles.

In the more basic gneisses pyroxene is usually the most abund-
ant dark mineral, though biotite and phlogopite micas are also 
frequent, some very micaceous bands occurring. Aside from fre-
quent narrow bands of amphibolite, hornblende is a relatively rare 
mineral in the Grenville rocks. These amphibolites may be sedi-
mentary, but seem to the writer more likely to represent original 
igneous dikes or sheets intruded into the series. Since, however, 
there is considerable variation in their appearance and make-up, 
they may be partly of one origin and partly of the other.

These Grenville rocks have the composition of sandstone, shales 
and limestones and their intergradations, and have a wholly dif-
fferent mineralogy from any known igneous rocks, whether met-
morphosed or not. Under metamorphism they seem to have 
wholly recrystallized and to have been greatly stretched in one 
direction, giving rise to the foliation, and drawing out such igne-
ous rocks as had been intruded into them into parallel bands with 
a foliation in common with them. The limestones were the most 
plastic of the beds under metamorphism, and, where the rocks 
have been most compressed, have often been so squeezed as to com-
port themselves much like igneous rocks, pressing into fractures 
in, and inclosing a number of fragments of, the more brittle inclos-
ing rocks, producing combinations which have a strong external