It will be best to begin with two common minerals which differ widely. The contrasts brought out in the comparison will help to fix the properties of both in the mind.

We will select white (milky) quartz, and grey, reddish, or black limestone.

Each pupil should be provided with a small paper or wooden box to hold the minerals, the glass rod or tube for the acid, a piece of rather fine, flexible wire, a piece of litmus paper, a bit of window glass, and other requisites. On each desk should be placed a cup of water, a small bottle of hydrochloric acid, and, if it can be afforded, each couple of the older scholars should have the use of a spirit lamp. Each pupil, also, should have a knife, or some pointed steel instrument (a large needle, for instance), for testing hardness. Ask the pupils first to find which of the minerals will scratch the other, using a sharp corner of each. When they have noticed that there is a very white mark left on each when rubbed by the other, but that only one of them makes a scratch in the other, ask them to account for these facts. They will conclude that the one which scratches the other is the *harder*, and the one which is scratched the *softer*. They will also find that the white streak in both cases is the color of the powder of the softer mineral. By reducing some of the latter to powder with a knife, it will be found to be white, although the mineral may be black. If a bit of the hard specimen be beaten or ground into powder, it will also be seen to be white. Tell them that the *color* of the powder of a mineral is called its *streak*. Let them now try to scratch a piece of glass with each mineral. They will succeed with the harder one only, and will infer that this one is harder than the glass, the other softer. They should next try to scratch each mineral with steel, and will conclude that one of them is harder than steel, while the other is much softer. The teacher might now inform them that the hardness of minerals is expressed in degrees, from 0 to 10, and that the hardness of the harder mineral is seven degrees; also that any substance as hard or harder than that is regarded as very hard. The hardness of the softer mineral will not be more than three or four degrees.

Direct the pupils to make a little loop at one end of a fine wire and fit into it a thin sliver of the softer mineral. Let them hold the wire so that the sliver is in the hottest part of the flame of an alcohol lamp. They will soon find that the wire becomes too hot to hold. Let them suggest a remedy. They will probably think of twisting the other end of the wire round a lead pencil by which they will hold the sliver in the flame for about five minutes. Direct them to drop it on a piece of litmus paper which has been reddened by hydrochloric acid, much diluted with water. The heated mineral will be found to be lustreless and friable. When dampened with water and pressed against the reddened paper it will turn the paper blue. Let them try the harder mineral in the same way. They will find that it does not become powdery, nor will it, when dampened, turn red litmus blue. It will also be found that if the softer mineral be dampened without being heated, it will not affect the color of the reddened paper. The pupils will now apply a drop of hydrochloric acid to each mineral. Bubbles will form on the softer one, but not on the other. Teach them the use of the term "effervescence." Have the minerals put into the cup of water to wash off the acid, and leave them there for a while. It will be seen that they are not soluble in water, at least not perceptibly so.

The teacher should now, but not before, give the names of the minerals. Marble, chalk, and other varieties of limestone (carbonate of lime, calcite), should now be examined in the manner described, and compared closely with one another and with the quartz. The pupils will see that they resemble each other in their properties much more than they do quartz. Marble shows little glistening surfaces when broken. Chalk is much softer than the others—hardness about one degree. But they are all soft; they all have a white streak; they all effervesce when treated with the acid; they all become white and crumbly when heated; the heated product, when dampened, always turns red litmus blue.

The pupils are now prepared to believe that they are all varieties of the same mineral, limestone (or calcite). They may be told that the lustreless, powdery substance obtained by heating them is lime, whence comes the name limestone. They will be able to tell, or to find out by enquiry, how lime is made on the large scale, and will be led to see that the method is really the same as that which they employed.

Some lumps of unslaked lime should be procured, and a piece as large as a small apple placed in a dish on each desk. When as much water as it will absord has been slowly poured upon it, it will become so hot that a match may be lighted in it as it crumbles up. It is now water-slaked lime. Set a lump of the unslaked lime away, and leave it till it is reduced to powder. This is air-slaked lime.

The principal varieties of quartz should now be taken up and examined as the first piece was. They will all be found to be very hard, unaffected by heat or acid, and insoluble in water. They differ much in color, as do the varieties of limestone. The pupils