AN INORGANIC PREPARATION.

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The Niagara limestone, one of the great formations of the geologic past, is accessible in many localities. The composition may vary in different sections of the country, but throughout northeast Iowa, where there are extensive outcrops, the rock is quite a pure dolomite. An analysis shows its composition as follows:

CaCO_3	about 55 per cent.
MgCO_3	about 43 per cent.
SiO_2	about 1 per cent.
Fe_2O_3 and Al_2O_3	about 1 per cent.
	<u>100 per cent.</u>

The experiment consists in separating the magnesium from the other constituents and changing it to magnesium sulphate or Epsom Salts.

The method is as follows:

Five grams of the fine rock powder are dissolved in hydrochloric acid by gently warming. The insoluble residue, mainly silica, is removed by filtering, and the filtrate is treated with a few drops of fuming nitric acid to oxidize the iron to the ferric condition, and the iron and alumina are precipitated from the boiling solution with a slight excess of ammonia. The filtrate from the iron and alumina consisting of calcium and magnesium chlorides is evaporated to dryness on the water bath and then changed to the sulphates by successive additions of pure, dilute sulphuric acid, being careful to avoid an excess. Water is added, and most of the calcium sulphate can be filtered off as it is soluble in the proportion of about four hundred parts to one. The magnesium sulphate can be separated from the remaining portion of the calcium sulphate by crystallization. To avoid an excess of ammonium salts which might interfere with the success of the experiment, not quite a sufficient amount of hydrochloric acid to dissolve the original rock powder may be added. If the ammonium salts seem to interfere, they may be removed by ignition. The equations that express the principal reactions are the following:

The dolomite powder may also be dissolved in pure dilute sulphuric acid, and the silica, iron and alumina removed as before. This will save time by avoiding the necessity of changing chlorides to sulphates.

Again, after dissolving the powder in hydrochloric acid, and removing the silica, iron and alumina, the calcium can be removed with ammonium oxalate, the filtrate evaporated to dryness, and the magnesium changed to sulphate by successive additions of sulphuric acid. The experiment is easily within the reach of high school students, and they become very much interested in thus preparing Epsom Salts. By it they also obtain a glimpse of the method of making a quantitative analysis of this and similar rocks.

COLORADO.

Colorado contains no important copper district, its main output of copper being incidental to the recovery of other metals. It will probably show no great change from the output of 11,485,631 pounds in 1909.

APPROPRIATIONS FOR THE WORK OF THE UNITED STATES GEOLOGICAL SURVEY.

Most of the appropriations for the work of the United States Geological Survey are included in the great Government supply bill known as "An act making appropriations for sundry civil expenses of the Government," popularly called the "sundry civil bill." The bill for the fiscal year closing June 30, 1912, contains appropriations for Survey work amounting to \$1,205,520. The principal items are as follows:

Topographic surveys	\$350,000
Geologic surveys	300,000
Mineral resources of the United States.....	75,000
Chemical and physical researches.....	40,000
Geological maps of the United States.....	110,000
Gaging streams, etc.	150,000
Surveying national forests	75,000

The bill also appropriates \$165,000 for printing and binding Survey reports, to be expended by the Public Printer.

In addition to these amounts the sum of \$100,000 for surveys in Alaska was included in the urgent deficiency act, approved December 23, 1910, and the sum of \$37,400 for rents was appropriated in the "legislative bill," making a grand total of about one and a half million dollars.