

mirably adapted to the work. It is less accurate than the mercurial, but much less liable to injury. It is generally of little value above an elevation of 5,000 feet. As is seen in the representation, (Fig. 41), the inches and subdivisions of the common mercurial barometer are marked upon it, and the index points to the different marks, according to its change of elevation. Every new Aneroid should be tested before much reliance can be placed upon it. To ascertain the height of a mountain above a valley by this instrument, multiply the space passed over by the index, (expressed in thousandths of an inch), by the number of feet of elevation requisite to move the index one-tenth of an inch, and cut off four right hand figures for decimals.

A Pedometer and an apparatus for sketching are also desirable.

SECTION II.

THE CHEMISTRY AND MINERALOGY OF GEOLOGY.

OF the sixty-two simple substances hitherto discovered, sixteen constitute, by their various combinations, nearly the whole of the matter yet known to enter into the composition of the globe. They are as follows, arranged in three classes, according to their amount; the first in each class being the most abundant.

1. *Non-Metallic Substances*.—Oxygen, Hydrogen, Nitrogen, Carbon, Sulphur, Chlorine, Fluorine, and Phosphorus.

2. *Metalloids, or the bases of the earths and alkalis*.—Silicium, Aluminium, Potassium, Sodium, Magnesium, and Calcium.

3. *Metals Proper*.—Iron, Manganese.

The metalloidal substances mentioned above, united with oxygen, constitute the great mass of the rocks, consolidated and unconsolidated, accessible to man. Oxygen also forms twenty per cent. of the atmosphere, and one-third part by measure of water. Hydrogen forms the other two-thirds of this latter substance; and it is evolved also from volcanos, and is known to exist in coal. Nitrogen forms four-fifths of the atmosphere, and enters into the composition of animals, living and fossil. It is found also in coal. Carbon, however, forms the principal part of coal; and it exists likewise in the form of carbonic acid in the atmosphere, though constituting only one thousandth part, and it forms an important part of all the carbonates, and is produced wherever vegetable and animal matters are undergoing decomposition. Sulphur is found chiefly in the sulphurets and sulphates that are