

been intruded through coal-seams and carbonaceous shales. Limestones have often a *fetid* odor; rocks full of decomposing sulphides are apt to give a *sulphurous* odor; those which are highly siliceous yield, on being struck, an *empyreumatic* odor. It is characteristic of argillaceous rocks to emit a strong earthy smell when breathed upon.

6. **Specific Gravity.**—This is an important character among rocks as well as among minerals. It varies from 0·6 among the hydrocarbon compounds to 3·1 among the basalts. As already stated, the average specific gravity of the rocks of the earth's crust may be taken to be about 2·5, or from that to 3·0. Instruments for taking the specific gravity of rocks have been already (p. 154) referred to.

7. **Magnetism** is so strongly exhibited by some crystalline rocks as powerfully to affect the magnetic needle, and to vitiate observations with this instrument. It is due to the presence of magnetic iron, the existence of which may be shown by pulverizing the rock in an agate mortar, washing carefully the triturated powder, and drying the heavy residue, from which grains of magnetite or of titaniferous magnetic iron may be extracted with a magnet. This may be done with any basalt (p. 155). A freely swinging magnetic needle is of service, as by its attraction or repulsion it affords a delicate test for the presence of even a small quantity of magnetic iron.

#### § v. Microscopic Characters of Rocks

No department of Geology has been more advanced in recent years than Lithology, and this has been mainly due to the introduction of the microscope as an instrument for investigating minute internal structure. As far back as the year 1827, a method of making thin transparent sections of