

WATER SUPPLIES AND WATER ANALYSES.

THE source of our water supplies is the rain. In coming down through the dust and gas-laden air, over the dusty roofs of our houses and barns into cisterns, in running over the surface of the soil, over the products of the decay of animals and plants into our streams and lakes, in sinking down into the earth through the humus layer and through the mineral-laden under-strata to the water-arresting ones, and thus to our wells and springs, solution of and suspension with the various substances encountered takes place. Some of these materials are chemical, some consist of living organisms. Of the chemical material some is organic, some inorganic; of the living organisms some are vegetable, some animal.

The inorganic substances that may be met with are variously soluble. Coming through arsenical, iron or lead ores enough might be taken up to render the water harmful; running through the sulphates and carbonates of lime, soda and magnesium a quantity of these sufficient to encrust boilers or fill them with mud, to use up our soap and in excessive cases give those who drink it various alimentary disorders, may be taken up. Of insoluble materials such as fine clay and disintegrated substances giving rise to turbidity, enough to be disagreeable, sometimes harmful, may be taken up.

Of the organic materials met with, some are merely the infusion of plants, either living or dead and now disintegrating, and are mostly harmless. Such material gives rise to color, odor and taste in water, but most of all to food for many kinds of lower forms of both vegetable and animal life. Again the organic matter may be from the bodies of dead animals, human or otherwise, or from their excreta. This also gives odor and color and tastes, often very disagreeable, and certainly very disgusting; and worst of all, such substances may be in themselves poisonous or be food material for pathogenic organisms of various kinds.

Now of the living organisms we have both kingdoms represented, the vegetable and the animal. Of these many are visible and many invisible; many are quite harmless, others just disagreeable and, unfortunately, many are quite dangerous.

Many of the ordinarily harmless ones, when in very large numbers, may become very annoying; for instance, conferva, asterio-