

separate, as for instance we have seen them to be at Zurich, and in Ontario. Hence our High School teachers should be university men, and the University or Universities, if we are to have more than one, in which teachers of high rank are trained, ought to have the means of giving thorough training in the subjects we have mentioned.

Among the employments which I have enumerated above, there are several which demand for those who are to follow them with the greatest success, in some cases to follow them at all, a higher education than the High School can afford. These are farming and lumbering, mining, civil and mechanical engineering, manufactures, and some forms of mechanic arts, as house and ship building. For the education of the men who are to be engaged in the higher departments of these industries or professions we ought to have a technical college with schools of agriculture and forestry, mining and metallurgy, civil and mechanical engineering, architecture, naval architecture, and manufactures.

The educational equipment such schools would require depends upon the number of subjects which should be taught in them. Let us take first the school of agriculture and forestry. Farmers should understand the nature of soils and manures, the structure and food of certain plants and animals, the breeding and the treatment of the ordinary diseases of those animals, the laying out, draining, and irrigating of farms, the construction of gates, fences, frame buildings, ploughs, wagons, even nowadays steam engines and machinery, and, as our farmers are fruit growers and lumberers as well, the growing of forest and fruit trees. We therefore require instruction in chemistry, agriculture and forestry, biology, veterinary science, portions of civil and mechanical engineering, and drawing; and to understand these subjects a student must have had a sufficient training in mathematics and physics. Hence our first school requires instruction in eight subjects. Science, however, cannot be learned from books or teachers alone, but by actual experience as well. Hence our agricultural school must be provided with a farm on which the students can work; and this farm should be worked actually by the students, a given amount of manual labour being required as part of the curriculum of the school.

A miner should know how to distinguish minerals, how to determine where they are, how to get at them, how to plan, survey, ventilate and work his mine, how to separate and reduce ores and perhaps how to refine metals. Hence our school of mining and metallurgy should provide instruction in mineralogy, geology, mining, engineering, drawing, assaying and metallurgy.

The courses of study, through which civil and mechanical engineers, architects, and ship-builders should be led, have many subjects in common. They should include the pure sciences of mathematics, physics, chemistry and geology, all the branches of