

reviews bearing on the two industries. There are classes for theoretical instruction, and classes for practice, covering together about forty hours a week.

*Section 7. Architecture and Building Construction.*—The classes prepare for the examinations of the Royal Institute of British Architects, and assemble twice a week for three hours (two to five) each time.

There are day-classes for teachers in wood-carving, manual instruction, and sloyd; and day-classes for women in French, German, Italian, dressmaking and cutting-out, needlework, and embroidery.

#### C.—*Trades School, or Evening-classes.*

The evening-classes are for persons who are engaged in trades or business, and who wish to complete or extend the knowledge they obtained at school, or the experience they have acquired in the workshop or store. The teaching bears especially on local industries, and the programme includes technical drawing, principles of science, laboratory work, and the use of tools and machinery. There are four sections.

*Section 1. Commercial.*—The subjects are commercial correspondence, commercial arithmetic, commercial geography, hand-writing, shorthand, book-keeping, French, German, Italian, Spanish, and Portuguese.

*Section 2. Sciences and Technology.*—A student cannot derive the full benefit of the classes in this section unless he has a good primary education, and attends regularly. There is a three years' course of study which students in chemistry, in construction, in the iron industry, or in electricity are recommended to pursue before they proceed to the advanced study of a single occupation. The technological classes are for the most part adapted to the examination programme of the City and Guilds Institute, and in these classes there is no free tuition. There is barely room for the 2,500 paying students.

For the iron industry there are classes as follows: 1. A class of instruction as to tools and machinery. The pupils learn the use of all the tools used in the construction of machinery; polishing-machines and hammering-machines—their history, development, and construction, and the limits of their application are explained in detail. (2.) Machine construction. The class is attended by those who intend to engage in this industry, by those who work in the offices of machine-builders, by those who are at work in one branch of the industry and wish to acquire a knowledge of some related branch, and by persons who for any reason wish to learn the use of tools. (3.) The forge class. (4.) Modelling. This class is for artisans and designers in the machine industry, who learn here the use of carpenters' and joiners' tools so that they may be able to make models of machinery.

For the building industry there are classes as follows: (1) Plumbing; (2) sheet-metal work; (3) masonry and bricklaying; (4) house-painting and decorating, letter-painting, gilding, plastering, and moulding; (5) woodwork, including joinery, sloyd, turning, cabinet-making, carving, carriage-building, railway carriage- and truck-building; (6) sanitation—construction, inspection, disinfection, sanitary law; (7) building quantities; (8) trigonometry.

In physics and electricity there are two classes for telegraphists—a class in electricity, to give a clear and exact idea of the instruments and methods, and a class in the theory and practice of telegraphy and telephony, illustrated with the aid of the latest and best instruments. There is a three years' course in electric light, and a practical course in fitting-up. For electro-metallurgy there is a two years' course. There is also a class for work in the electro-chemical laboratory.

Under the head of chemical industries there are courses as follows: (1) Metallurgical laboratory, three years; (2) manufacture of iron and steel; (3) chemistry of brewing, two years; (4) photography, two years; (5) dyeing, bleaching, and printing cotton, linen, and silk; (6) carbon product; (7) paper-making and staining, &c.; (8) analysis of gas.

For the textile industries there is a separate building, the cost of which was defrayed from a legacy of Sir Joseph Whitworth. The machines have been presented by different manufacturers, with the exception of one which was bought and presented by students. The machinery and apparatus alone are valued at £6,000. The subjects of instruction are the same here as in the day-classes, but the treatment is more elementary. The fee is £2 for a course extending over thirty weeks with three lessons a week, while the fee for the day-classes is £15 15s. a year. There are classes for printers, lithographers, farriers, and tailors, and in sewing and embroidery.

The School of Art has a two years' course. There are about fifty pupils, of whom only a few are artisans. In 1893–1894 the number of pupils in all the departments of the Manchester Technical School was 3,223. The expenditure of the Technical School was £13,387 (of which sum £5,922 was for salaries of teachers), and its income £6,890 (of which £4,416 was derived from fees, and £1,427 from Government and municipal subsidy earned by the school). The expenditure of the School of Art was £3,882, and its income £1,978. The deficiency was made up by endowment revenue of about £417, and a contribution of about £8,000 from the special fund of the municipality for technical education.

[The remaining articles of Part V. relate to the Manchester Museum of Manufactures; Birmingham Technical School and Art School; University College, Nottingham; Liverpool Trade School, University College, and Navigation School; Bradford Technical School; Leeds Mechanics' Institute; Yorkshire College, Leeds; Sheffield Technical School; and operations in towns of the second rank—Halifax, Bolton, Oldham, Preston, Blackburn, Warrington, Coventry, Huddersfield, Oxford.]

#### PART VI.—SPECIAL SUBJECTS.

[The special subjects are: Commercial instruction, manual instruction in primary schools, evening-classes organised by the School Boards, technical education in the country districts, and