ia accommodated in a building especially adapted to the purpose. In this school instruction is directed towards the staple industries of the district, namely, weaving, dyeing, and engineering. There are many other similar schools in France, the object of which is to give the children of artisans and small shopkeepers a higher practi­cal education in order to fit them to occupy the posts of foremen, overseers, and superior clerks in manufacturing and commercial firms. A large number of poor children showing talent are selected from the primary schools and receive scholarships ; and the objection sometimes urged against the establishment of higher elementary schools,—that the better classes only are able to benefit by them—is thus obviated. In Germany the real-schools in which Latin is not taught, known as *Ohnelatein Realschulen,* have very nearly the same objects as the higher elementary schools of France. The instruction in these German schools is not yet so practical as in the schools of France. Drawing is always well taught, and the schools generally contain good chemical labora­tories, as well as collections of physical apparatus and museums. From the children of these schools the ranks of foremen are largely recruited. They receive no special trade instruction, but the general training is so arranged as to qualify them for higher posts in industrial works. The cost of this higher education seldom exceeds £3 per annum. In Bavaria it is two shillings a month. In most of these schools, as well as in the chief intermediate com­mercial schools, the exit certificate exempts a lad from two of the three years’ compulsory military service, and this regulation, to which nothing corresponds in England, is an incentive to parents to allow their children to receive higher instruction, which operates very forcibly in largely increasing the number of well-educated youths in Germany. In these opportunities for higher education England is still very deficient, and the complaint is generally heard of the difficulties of obtaining competent foremen.

3. *Masters. —*The best special schools for the training of future masters, managers, engineers, manufacturers, and industrial chem­ists are in Germany, and are known as technical high schools or polytechnic schools. Schools of a similar character are found in other countries, and in England the facilities for higher technical education have within the last few years greatly improved.

In Germany the polytechnic or *technische Hochschule* is an institution of university type in which the education has special reference to industrial purposes. In many respects the teaching coincides w’ith that given in the universities. The chief distinction consists in the arrangement of courses of instruction in the several departments, in the admission of students having a non-classical preliminary training, and in the absence of certain faculties found in the university and the addition of others. It is not correct to say that the polytechnic is a professional school as distin­guished from the university ; for the faculties of law, medicine, and theology give to the university as distinctly a professional character as the faculty of engineering gives to the polytechnic. Nor can it be said that the scientific studies at the universities are less practical than at the polytechnic. For, whilst workshops for instruction in the use of tools are found in very few of the polytechnic schools, the laboratories, for the practical study of chemistry and physics, are perhaps better fitted and under more eminent professors at some of the German universities than at the polytechnic schools. At the same time, engineers of every descrip­tion, architects, and builders, besides a great number of manufac­turing chemists, find in the polytechnic the scientific and technical training which the lawyer or physician, and in many cases the industrial chemist, seeks in the university.

In some of the large cities—in Berlin, Vienna, and Munich, for instance—the university aud polytechnic coexist ; and in certain cases, in which a very special training is required to fit a youth for his career, the German student, after spending three or four years at a polytechnic school, passes on to another institution, such as a dyeing school, in which his studies are further special­ized with a view to his future work.

Taking the technical high school of Munich as a type of other similar institutions, we find the cost of the building and of the various collections it contains to have amounted to nearly £200,000, and the annual cost of maintenance to be about £20,000. The institution consists of six schools:—(1) the general; (2) the civil engineering; (3) the building ; (4) the mechanical engineering; (5) the industrial chemical ; and (6) the agricultural. A department for electrical technology is now being built. In other institutions there are architectural, pharmaceutical, and mining schools. The programme of the Munich school gives a list of about 180 different courses of instruction distributed over the several departments. A separate professor is engaged to lecture on that particular subject with which he is specially conversant, and the number of such pro­fessors attached to a polytechnic school is very large. In the engineering department there are six or seven distinct courses of lectures under the direction of thirteen professors. The largest and most recently constructed of all these institutions is the polytechnic school of Berlin, which was completed in 1884 at a cost of about £450,000. In France the institutions in which the highest techni­cal instruction is given are concentrated in the capital. There are a large number of provincial colleges where the education is some­what more practical, but where the mathematical and scientific teaching is not carried to so high a point (the Ecole Centrale at Lyons, the École des Mineurs at St Étienne, and the Institut du Nord at Lille, &c.). The École Centrale of Paris, in which the majority of French engineers who are not employed in the Govern­ment service are trained, is a rare instance of an institution for higher technical instruction which is self-supporting and inde­pendent of Government aid.

In Switzerland the federal polytechnic of Zurich is similar to the polytechnic schools of Germany and Austria. Italy has three superior technical institutes,—one at Milan, one at Turin, and one at Naples, in which technical education is given on the same lines as in German polytechnic schools. Holland has an excellent institution at Delft, which was opened in 1864 ; and in Russia the imperial technical school at Moscow is a high-class engineering school, in which the theoretical studies are supplemented, to a greater extent than in the German schools, by workshop practice.

In some of the German schools the fees charged vary according to the number of lectures and to the number of hours of practical work which the student takes per week. Thus at Munich the entrance fee for each student is 10s., and the lecture fee is 2s. 6d. for each hour’s lecture per week, including the use of materials. At Zurich the cost of a student in a chemical department, including laboratory practice, does not exceed £12 per annum, and in other departments it does not exceed £4 per annum. At Delft the student pays about £16 per annum for a complete course.

In England there is a growing tendency to associate technical with university education. This is mainly owing to the fact that the colleges which have recently been established to give univer­sity education are poorly endowed, and have found it necessary to attract students by meeting the increasing demand for technical instruction. Most of the provincial colleges may indeed be regarded as technical schools with a literary side. In order that they may provide university education in addition to sound technical in­struction, it is necessary that they should be placed on a sound and satisfactory footing by means of state endowment. Of the more recently erected English colleges, the Owens College at Man­chester is the most important, combining the faculties of a German university with those of a polytechnic school. The Yorkshire College, Leeds, possesses a special school for the teaching of weav­ing and dyeing. Other somewhat similar institutions are found in Birmingham, Newcastle, Sheffield, Nottingham, Dundee, Cardiff, and elsewhere. The university of Edinburgh has a good school of chemistry, physics, and engineering, and the university of Glasgow has been long distinguished for the excellence of its physical laboratories. In University College and King’s College, London, the metropolis possesses two institutions each of which may be likened to a university and a polytechnic combined. In the uni­versity of Cambridge there are mechanical workshops in connexion with the chair of engineering. The Royal School of Mines and the normal schools of science and art in South Kensington are the only technical institutions in England supported by state aid. The central institution in London has more in common with the German polytechnic school than any other institution in Britain. This school is designed for the technical teaching of engineers, architects, master builders, and industrial chemists. It was built at a cost of £100,000, and is maintained by an annual grant from the City and Guilds of London Institute of £10,000, in addition to the students’ fees.

Such is a brief outline of the means provided for the technical education of masters in different parts of Europe. It will be seen from the foregoing statement that efforts are now being made to bring Britain more nearly on a level with other countries in the provision of those kinds of instruction which are best adapted to the different classes of producers. But as yet only a beginning has been made, and in England technical students can be counted by hundreds, whilst those of Germany are numbered by thousands.

For further information the reader is referred to the *Report* of the royal commissioners on technical instruction, published in 1884. (P. M\*.)

TEETH. See Mammalia, vol. xv. p. 349 ; Digestive Organs, vol. vii. p. 232 ; Ivory ; and Dentistry.

TEGEA, one of the chief cities of Arcadia, of which its territory occupied the south-eastern corner, being bounded on the S. by Laconia, on the E. by Cynuria and Argolis, on the N. by the territory of Mantinea, and on the W. by Mænalia. Its legendary founder was Tegeates, son of Lycaon. Like many other cities of ancient Greece, Tegea was formed by the union of a population which had previously lived dispersed in villages. The people were divided into four tribes,—the Clareotis, Hippothœtis, Apolloniatis, and Athaneatis. Tegea offered a stubborn