of managers in engineering and industrial works—are found in the United States. On leaving the secondary school, the American student may go at once into business: or he may proceed to a college, with a four years' course of general instruc­tion ; or he may enter a professional or technical school. Some students prolong their education by taking the general course before proceeding to the technical institu­tion. As in the lower, so in the higher grades of instruction, the distinction between general and technical education is not very clearly defined. There are some institutions devoted almost ex­clusively to professional training; whilst in others the engineering faculty exists side by side with other faculties of university rank. The general interest in higher education which is shown by the desire of students of all classes to obtain it, in many cases at considerable individual sacrifice, and by the value which masters and employers attach to a college-trained youth, is partly due to the large proportion of pupils from the ordinary schools who proceed to the secondary or high schools. It is estimated that the pupils between the ages of fourteen and eighteen in attendance at these schools constitute at least one per cent. of the entire population of the United States. In several of the American institutions known as colleges, but not easily distinguishable from the universities, courses of general or technical instruction are provided of all intermediate grades, but above that given in the high schools. In addition to these there are some well-known institutions which provide courses of pro­fessional and general instruction of the highest grade under pro­fessors of eminence and distinction, and facilities for research which are not surpassed in any German university or technical high school. To the foundation and maintenance of these schools wealthy citizens have given or bequeathed enormous sums of money, and they further enjoy the proceeds of the sale of lands which were set apart under the Morrill Act of 1862 to give assistance to institutions providing instruction in agriculture and the mechanical arts. Several colleges whose work was mainly literary took advantage of this act to establish scientific and technical courses in order to secure the income to be obtained by compliance with its provisions.

Without entering into great detail, it may be said that the schools providing advanced technical instruction may be grouped under three headings: (1) those which are free from state or government control and are maintained from funds arising out of endowments and students’ fees, such as the Massachusetts Institute of Technology and the Stevens Institute of Technology, Hoboken; (2) schools which form part of, or are affiliated to, the universities, which are equally independent of public control, such as Columbia University, New York, and the Sibley College of Mechanical Arts, Cornell Uni­versity; (3) schools and colleges attached to state universities, receiving grants from the state, such as the universities of Illinois and Michigan.

Contributions from private sources towards the establishment and equipment of these institutions are far in excess of those in any other part of the world. Between the years 1890 and 1901 these contributions amounted to about £23,000,000.

The American universities, with which the technical institutions are in many cases closely associated, differ from those in the United Kingdom in their examinations for degrees. In this respect they have adopted the practice of the German and other continental universities. The examinations are almost uniformly conducted by the teachers. The external examiner is practically unknown. This system allows considerable freedom to the teacher, and is said by competent judges to be attended with excellent results. In many of the states, particularly in the east, even the matriculation, or entrance examination, is being superseded by a system known as the “ accrediting ” system of the secondary or high schools, where the students receive their general education. According to this system, the schools are inspected by the professors of the university, and those in which the equipment, the courses of instruction, and the method of teaching are found to be satisfactory, are included in a list of “ accredited ” or approved schools, and the pupils of such schools, who produce a certificate of having satisfactorily attended the prescribed course of study, are admitted to the university with­out passing any entrance examination. An advantage of this system is that it brings the professors of the university into direct relationship with the schools in which the students receive their preliminary training, and closely connects the instruction provided in the school with the higher and more specialized teaching of the university.

The widespread appreciation of the advantages of the higher education among all classes of the American people, and the general recognition among manufacturers, engineers and employers of labour, of the value to them, in their own work, of the services of college-trained men, has largely helped to increase the number of students in attendance at the universities and technical institutions, and to encourage in every state the foundation of schools for advanced professional training.

The institutions in which the highest technical instruction is provided are those devoted to the teaching of engineering in all its branches, including mining engineering, and of chemistry' in its application to manufacturing industry; besides schools of agri­culture and forestry and schools of design.

Of these the Massachusetts Institute of Technology at Boston is the most typical. It was founded in 1859 with a view to supplying a complete system of industrial education, supplementary to the general training of other institutions. In 1861 an act was passed incorporating a body of persons for the purpose, *inter alia,* of aiding in the advancement of science in its application to the arts, agri­culture, manufactures and commerce. The institute offers thirteen distinct courses. Of these, eight are devoted to engineering, in­cluding naval architecture ; four to chemistry, physics, biology and geology, and one to preparation for professional teaching. In 1904 there were 183 instructors on the permanent staff of this institution. As indicating the practical character of the teaching in this and in other similar schools, it should be noted that the railway companies co-operate in making provision for tests on a large scale, and in permitting the use of locomotives on their line for the purpose of giving practical training to the students.

At Columbia University, New York, the school of applied science was established in 1864, and consists of a fairly complete school of technology with a four years’ course of instruction. An interesting department at Columbia is the professorial school for the study of education and the training of teachers. The importance of manual training is recognized by the fact that the professor of this subject has a seat in the faculty of applied science. Two schools of observa­tion and practice are maintained—the Horace Mann School and the Experimental School. The former comprises three departments, a kindergarten, an elementary and a high school. The experimental school is under the immediate direction of the professor of the theory and practice of teaching. The facilities provided for the professorial and technical training of teachers are one of the most valuable features in the educational system of the United States.

In England there is a growing tendency to associate technical with secondary education. The central technical college of the City and Guilds of London Institute, was an institution established exclusively for the purpose of providing the highest grade of engineering education. In this respect it compared more nearly than any other institution with the technical high schools of Germany. The Royal School of Mines, connected with the Royal College of Science, was a similar institution, providing the highest teaching for mining engineers. In Birmingham, Leeds and Sheffield, schools of applied science were established under the names respectively of the Mason College, the Yorkshire College of Science, and Firth College, which gradually developed into technical colleges to which a literary side was attached with provision for advanced humanistic studies. The oldest of these colleges was the Owens College, Manchester, which combined the curriculum of a university with that of a technical high school. Its school of applied chemistry was, for many years, one of the most flourishing in the country. In 1882 a somewhat similar school was founded in Liverpool as a university college, and the Yorkshire College of Science similarly widened its curriculum. To this college, a textile school, including a department for dyeing and design for textiles, was added by the munificence of the Cloth­workers' Company of London. This department soon developed into one of the best-equipped institutions in the country for the study of the technology of textile manufacture. The three colleges at Manchester, Liverpool and Leeds were incorporated in the year 1885 into the federal Victoria University. Other textile schools for day students, providing a full course of advanced instruction, were founded at Bradford, Huddersfield, Halifax, Bolton, and in other parts of Yorkshire and Lancashire. In 1903 University College, Manchester, received a royal charter as the Victoria University of Manchester, and the University College of Liverpool became a separate university. In the following year the Yorkshire College received a charter of incorporation as the University of Leeds. These three universities provide full courses of instruction in en­gineering and in the industrial applications of science. Charters of incorporation as universities were also granted to the colleges at Birmingham and Sheffield. The Birmingham University, covering an area of over twenty-five acres, contains blocks of buildings devoted to the teaching of mining and engineering, and at Sheffield there is a special school dealing with the metallurgy of iron and steel.

The University of Manchester soon after its incorporation entered into arrangements with the municipal school of technology in that city, by which the faculty of technology was in part carried on in the well-equipped buildings of the municipal school, the largest institu­tion of the kind in Great Britain. It was publicly opened in the year 1902. In these new universities ample provision is made for the teaching of electrical engineering and electro-technics generally, and the laboratories provided for this purpose are well equipped with machinery and apparatus, and compare not unfavourably with some of the most recently erected in Germany. Schools for mining engineers have been established at Wigan and Camborne and Red­ruth. In Wales, at different times, local colleges of university rank were opened in Cardiff, Bangor and Aberystwith, and those three colleges were subsequently united in the University of Wales. In all these local universities the technical instruction forms part of the ordinary university courses in which degrees are granted.

Other colleges outside London, besides those named, which par­ticipate in the government grant allocated to universities and colleges, giving higher grade instruction of a technical character.