Germany, Switzerland, the United States, and England, he would briefly summarise the views of some of our leading educationists concerning the best methods of teaching.

Creasey, a noted writer on technical education, discusses the merits of the three courses of instruction given in England, namely, (a) unbroken apprenticeship, with optional attendance at evening classes; (b) a Technical College course followed by a shortened period of apprenticeship; and (c) the combination of the two systems, the college alternating with the workshop. With respect to the first method, this expert maintains that all teaching must keep in view the mind-content (the mastered-knowledge-accumulation) of the pupil, as new ideas can be assimilated only in so far as they can be associated with ideas already existing in the student's mind. The problem, the solution of which may be left to the advocates of the second method, is the possibility of a lecturer, say on engineering, making himself intelligible to pupils whose knowledge of actual workshop conditions is largely visionary. Dealing with the second method, Creasey emphasizes the importance of deferring instruction until the pupil is enabled, by that maturity of mind which comes with years, to take the fullest advantage of it. Everyone, says this writer, knows that mental grasp, breadth of view, earnestness of purpose, and all those intellectual attributes which make for success in life are associated with a development of the brain not often found during the adolescent period.

Professor J. A. Fleming, of University College, London, favours a mixed course, and states that his experience has been that a considerable proportion of those who enter a college directly after leaving school for the purpose of passing through a course of engineering, not only come very inadequately prepared to benefit by professional teaching, but they were handicapped also by

a schoolboy habit of mind. Indeed, it is not until the young student has developed sufficient character and power to study, apart from the control to which he has been accustomed at school, does he make the best use of his time and take the full advantage of his opportunities. The Professor found that young men who, on leaving school, had been placed in engineering works as pupils, and who, after the elapse of a couple of years, had returned to college to take up the theoretical side of their studies, worked much better than any other class of students, and were more eager to make the best use of their time at college than the schoolboy of sixteen or seventeen who came straight from school to college. In the light of this experience Professor Fleming advocated one year's college course for pure science, followed by two years in engineering works, then two years more at college, and finally back to the works.

On behalf of the system of straight-ahead apprenticeship, with optional attendance at evening classes, it has been urged that the lad is more pliable, more amenable to the stringent discipline of the workshop, at sixteen or seventeen than he would be at nineteen or twenty. Among employers there was a growing tendency to insist upon their apprentice lads observing the regular working hours, and the method of straight-ahead apprenticeship made it imperative upon parents and guardians to decide early in the lad's life whether or not he could stand the stress and strain of an industrial career. "If," says one authority, "you wish to make a boy an engineer, enquire into his physique and stamina. If these are lacking, put him in a place where he will be out of the draught." The lad who is introduced to industrial life as a straight-ahead apprentice will not only be accumulating practical knowledge that will make his subsequent theoretical instruction intelligible, but he will be concurrently deferring that instruction until his mind

is able to grasp the broader scientific and economic principles involved. It is further pointed out that the objections raised against one or the other of the first and second methods of imparting technical training to the apprentice appears to be persuading engineers to adopt the Sandwich system, as embodying most of the advantages and fewer of the disadvantages of either. A noteworthy characteristic of the Sandwich system is the intervention of periods of months between works and college attendance. At the Engineering Conference, held in London in June, 1903, many speakers expressed their approval of this method, which has many advantages to offer to those lads who are fortunate in being born in such happy circumstances that they can plan their training irrespective of its cost. The Sandwich system of technical training does not imperatively demand attendance at classes as soon as a lad has left school, and a period in engineering works may precede it. At the conference above referred to, Professor Barr read several letters from Scotch engineers, who, while generally conceding all the merits of the Sandwich system, considered, nevertheless, that a year, or a couple of years, in the workshops was preferable to going straight to college.

In this connection it was interesting to note the very intelligent view taken by the London County Council of this question—a view to which he had already referred, and which had for its primal objective the lengthening of the period of school life in order to secure time for special instruction in manual training and drawing. Another authority, Professor Ripper, dealing with the comparative merits of workshop and college training, regards each method with favour. Early contact with skilled workmen, and the knowledge gained of the workman's habit of thought and point of view would, in the Professor's opinion, teach the student to appreciate the

former's qualities and acquirements. Concerning the question of the advisability of entering college direct from school, the Professor remarks that the course followed is often the result of competitive examinations for scholarships, and is direct evidence of the value of this form of training, especially in regard to Mathematics and the habit of study. On the third system, i.e., works and college attended concurrently, Professor Ripper insists upon its approval by many of the Glasgow firms, and he himself was quite certain that the method was a very good one. The same authority, by the way, in an article in "Page's Weekly," observes that the unsympathetic attitude toward technical education, which used to be so common among foremen and employers in England, was undergoing a rapid change, but it was certainly not yet an universal experience. Moreover, while admitting the encouragement offered by employers to apprentices, he suggested that there was no form of encouragement comparable in effect with that which made admission of youths to engineering works, and promotions of apprentices therein dependent, at least to some extent, upon the educational attainment of the aspirants. This would be an effectual means of stimulating the apprentice himself to higher stages of advancement. The apathy and indifference towards educational improvement so general among apprentices and young workers generally would be largely removed when they are made to realize that there is, as a rule, no promotion for them unless they are able to show that they possess educational, as well as practical, fitness, for such desired promotion. This standard of mental efficiency and instrumental alertness is, of course, altogether incompatible with the existing system of our New South Wales compulsory education law, by the operation of which the Government loses all control of its young citizens when they arrive at the age of four-

teen years, a point in their life at which the mind is best fitted to receive the initial teachings of a course of secondary education. Promotion of apprentices, based on educational qualifications, is, by the way, exclusively adopted in the Government Dockyards of Great Britain, and the results of the method have, without a shadow of doubt, been satisfactory in the highest degree. If employers made admission to their engineering workshops, and promotions in them, dependent upon educational merit, a great impulse would be given to study on the part of the apprentices. Indeed, a very strong point can be made of the argument that, in the race for commercial supremacy, Great Britain, America, and Germany are each, probably, well-equipped in up-to-date appliances and machinery; but these are merely tools awaiting the application to their use of that real element of success, the intelligence and virility behind the tools, for which we can depend only upon the quality of the individual men (from top to bottom) of the industrial army, and particularly upon the quality of the men at the top—the Leaders—whose character, ability, foresight, judgment, power of organization, and force of inspiration must ultimately determine the degree of success of the efforts of the whole. In short, one might boldly declare that the future commercial supremacy of any one of the great nations cited is now being created by the best methods adopted for the technical education of its youth. Advanced educationists, both in America and in England, but particularly in the latter country, appeal for facilities to enable promising students of the apprentice class to enter, by means of scholarships, to advanced courses of instruction in day-conducted institutions. They ask for a closer relationship between the employers of apprentices and the teachers in Technical Institutions, in the interests of public efficiency and of private well-being. They refer to the want of recognition on the part of some employers of the Technical College

Certificate, although at the same time they know of men of education and training who appreciate the value of the technically trained student. These comments are as applicable to Australia as to England, but prejudice and indifference are obstacles in the path of progress which can be removed only by persistent and unremitting courage and effort.

The system followed at the Sydney Technical College can be summarized briefly in an account of a synopsis of classes, and an enumeration of what the State is doing to promote technical education in New South Wales.

Our Government has introduced a very munificent scheme of scholarships and bursaries for the Technical Institutions of the State which should raise the status of the apprentice.

Scholarships.—Twenty junior technical scholarships are available for students under fifteen years of age. These are tenable for two years at a Technical College or School or Continuation School. Holders are exempt from fees, receive text books and travelling allowance up to £5 per annum. Age limit, under 15.

Twelve intermediate technical scholarships—to Technical College courses—Agriculture, Sheep and Wool, Chemistry, Assaying and Metallurgy, Mechanical Engineering, Sanitary Engineering, Mining, Architecture, Art. Tenable for three years: open to all boys still attending school over 17 years of age. Holders are exempt from fees—text books paid for (£1 10s.); travelling allowance, £5 per annum.

Four senior technical scholarships—to organised day courses of Technical Colleges.

Candidates must be under 18 years of age. Tenable for three years. Holders are exempt from fees, text books granted up to £2, monetary allowance, £20 per annum.

Three scholarships from classes in small Technical Schools to advanced classes in the same subjects at central Technical Colleges. Exempt fees, text books granted to £4 per annum, monetary allowance from home (£30 per annum), £5 for travelling, if at home, when necessary.

Scholarships in connection with the evening classes at the various central Technical Schools and Colleges. They will be awarded on the results of examination held at the end of each year. They will entitle the successful candidates to exemption from payment of college fees for the courses they are attending for the ensuing year. Two of these scholarships will be allotted amongst the students of each year in each subject.

Research scholarships, tenable for one or more years, shall be awarded to students who have completed their full course at the Sydney Technical College. These scholarships will entitle the holders to the use of laboratories and apparatus necessary for the research undertaken by the student.

Scholarships to cookery classes at the Sydney Technical College and to dressmaking and millinery classes are available for the female sex.

Bursaries.—Seventy-two district and high school bursaries, including Hurlstone Agricultural School or other Continuation Schools, are tenable for three years, and entitle a boy to free education, to a grant of text books to the value of £1 10s. per annum, to an allowance when

boarding away from home of £30 per annum, and, where not boarding away from home, to £10 per annum. Age limit, under 15.

Twenty junior technical bursaries are tenable for two years at a Technical College or School or Trade School, and entitle a boy to free education, a grant of text books up to £1 10s. per annum, of a travelling allowance up to £5 per annum. Also, when boarding away from home, an allowance of £20 per annum, but, when not necessary to board away from home, £10 per annum. Age limit, under 15.

Eight intermediate technical bursaries—to organised day courses at Sydney Technical College.

These will be awarded annually upon competitive examinations to boys who have attended a High School, District School, or Superior Public School and who are under 17 years of age. They are tenable for three years at any of the organised day courses of the Sydney Technical College, and will entitle the holder to exemption from payment of fees, to a grant of text books to the value of £1 10s. per annum, and to an allowance of £10 per annum if a student lives at home, and £30 when he must board away from home.

This magnificent system of scholarships and bursaries is largely in the interest of the apprentices, and especially in the case of the lad who, having the ability, might not otherwise have the opportunity.

BEST TYPE OF SCHOOL.

If he were asked to recommend the best type of school for introduction into our State system of technical education to meet the needs of our young men, he would not hesitate to name the Technical High School of America

or the Technikum of Switzerland. These give that educational status so strongly emphasised by Professor Ripper.

When we come to consider what is best for the technical student and the apprentice in our own State, and to determine the practicable and suitable for our own Technical Colleges, the methods and practice obtaining in the Old World and in America are deserving of the greatest consideration, inasmuch as they are the result of repeated trials and amendments and of long and painful experience and observation.

The English system, under the operation of which the lad goes direct into the workshop, upon leaving the ordinary school, in order to undergo an apprentiecship, is the system which obtains largely in our own city of Sydney. The Bootmaking School at Erskineville has a large percentage of apprentices, who attend in the evening to receive instruction from specialists on the various machines used in this handicraft. A class for instruction in the scientific principles underlying breadmakng was inaugurated this year in the Sydney Technical College; but, as yet, it had not largely been availed of by the apprentices. He knew, however, that the master bakers were giving the movement a good support, and were putting forth a strong effort to popularize it among their young workmen. The engineering workshops and trades classes were full to overflowing, and extra accommodation for the young workers would shortly be completed. The different lecturers and teachers engaged at the central college assured him that a large percentage of the students were employed in various industrial callings, while many were apprentices. He found this to be the case not only in the engineering classes, but also in the architectural, the plumbing, the carpentry, and the printing arts and crafts. These students attended

the college classes in order to obtain the instruction which constituted the complement of that gained in the workshops of their employers; and herein he agreed with the German procedure, which enabled the apprentice to supplement that which he learnt of his trade or craft in the place where it was carried on with knowledge acquired by attendance at a technical school. He was inclined fully to endorse the very sensible recommendation of the London County Council to the effect that youths should be trained in the day schools until they were sufficiently skilled to make it worth the while of employers to take them into the workshops at a reasonable weekly wage, and without the payment of a premium. He firmly believed in the soundness of the Council's contention as to the desirability of making every effort to lengthen the term of school life, and the affording, during the last two years of that school life, of every opportunity for special instruction in manual training and in drawing.

He had not the slightest doubt that the creation of an intelligent, a loyal, and a worthy type of worker was greatly furthered by the encouragement given by many English firms to their apprentices, namely, the holding of classes in their own establishments, the filling of vacancies from the ranks of their own apprentices, the giving concessions in the matter of free day-time to those who attended evening classes, the paying of fees and the providing of books and instruments, and, in a few cases, the granting of a small weekly bonus. In this connection it was worthy of remark that the employers and manufacturers of Sydney treated their apprentices attending the Technical College very generously in the matter of awarding prizes and the payment of fees. This was highly creditable, both to themselves and the land in which they lived. He would emphatically assert, also, that wherever the employer had shown an interest in his appren-

tice the latter had responded to the very best of his ability. With Professor Ripper, and other educationists whose opinions he had quoted, he was in entire agreement with respect to the assertion that there was no form of encouragement comparable in effect to that which made admission of youths to the works, and promotion of apprentices in the works, dependent, at least to some extent, upon educational attainment. His constant aim in directing the policy of the Sydney Technical College, and the technical educational system of the State, would be the enforcement of the principle enunciated by this great educationist, and the sequent endeavour to raise the mental status of the apprentice and the student. In conversation with employers of apprentices, he had heard the statement that the youths admitted had not reached the unexpected standard, and the reason given was invariably that the lads had not advanced to an adequate educational standard before beginning their apprenticeship. They had left school too early, and he considered it a very serious thing that Australian boys should give up the benefits of a free system, and an excellent system, too, of public school education at so early an age as 14 years, and he could quite understand that a majority of these would not turn out good tradesmen, but would be found rather in the ranks of unskilled labour. To cure this very serious and regrettable defect and neglect, he considered that the best means to be employed are the Continuation School and Technical Classes. From the establishment on a recent date of the Technical Day School in connection with the central College, a better type of apprentice may in the future be expected. This Technical Day School includes in its subjects of instruction courses in English, Mathematics, Physics, Chemistry, Drawing, Manual Training, and Working in Wood and Iron.

In conclusion, he must say that he was keenly alive to the necessity that existed for affording the greatest facili-

ties to our young men in the attainment of proficiency in their various trades. He had been an eye-witness of the methods and means by the aid of which the young American reached fortune. Opportunities come forth to meet him, and he was aware of the fact that the same advantages were not yet our happy possession. The Technical College and the workshop of the apprentice must be allies, they must go hand in hand, one must be the complement of the other, and in this regard he could most sincerely say that the College was doing admirable work.

In opening his address he had occasion to refer to the legislation of an intimate and exceptional character which affected the apprentice in this State, and constituted the Technical College a portion of the machine for dealing with this very important individual. In a recent award of the Arbitration Court the President delivered the following judgment in the matter of the dispute between the Amalgamated Society of Engineers, industrial union of employees, and the Iron Trade Employers' Association, industrial union of employers:—"Apprentices and Improvers.—All boys shall be apprenticed for five years, either by verbal or written agreement, to learn one of the following trades: Fitter, turner, fitter and turner, smith, coppersmith, brass-finisher, or pattern-maker. Any such written agreement may provide for the transfer of the boy if the master should be unable to provide him with continuous instruction to some other employer or employers. A boy may be taken on probation for not more than four months, and if he is apprenticed such time of probation shall count as part of his five years. If facilities are provided at the Technical College any boy apprenticed to a Sydney master engineer shall, during at least two years of his apprenticeship, attend on at least two nights in each week the classes of the said college in engineering or in the engineering trade to which he is apprenticed, the fees

thereof to be paid by the employer; that such boy shall not be admitted as journeyman unless he obtains certificates from the Technical College of having so attended. When a boy is out of his time he may, if he is not yet a competent tradesman, able to earn the minimum wage, work as an improver for not more than two years. During such two years he shall, if paid at time rates, be paid at a rate not less than 1s. per hour during the first year and at a rate not exceeding 1s. 2d. per hour during the second year. Every apprentice shall, at the end of his time, be given a certificate of service and competency by the employer in whose shop he has finished his time.

"Duration of Award.—This award shall come into operation on June 19, 1908, or on any subsequent date to which it may hereafter from time to time be postponed, by order of the Court, and shall continue in force for a period of three years thereafter."

INDUSTRIAL DISPUTES ACT.

Clause 7 (1)—Awards, &c.

All awards, orders, and directions of the Court of Arbitration, and all industrial agreements, current and in force at the commencement of this Act, shall, until rescinded under this Act, be binding on the parties and on the employers and employees concerned—

(a) For the period fixed by the said Court, or by any such award, or order, or agreement; or

(b) Where no period is fixed, for one year from the first day of July, one thousand nine hundred and eight;

and the same may be enforced under the provisions of this Act.

If this award is to have its due effect, and Clause 7 of the Industrial Disputes Act makes clear what has to be done, then the Technical Colleges will have to stand in very close relation to the apprentice.