F. H. SPENCER

TECHNICAL EDUCATION IN AUSTRALIA AND NEW ZEALAND

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A REPORT ON

TECHNICAL EDUCATION IN AUSTRALIA AND NEW ZEALAND

By

F. H. SPENCER, D.Sc., LL.D.

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AUTHOR'S PREFACE

THIS report on Technical Education in Australia and in New Zealand is the outcome of a visit in 1938 to those Dominions which followed a similar tour of South Africa in 1937. (See "A Report on The Technical Colleges of South Africa.") This visit, which involved a seven months' tour, was made possible by the generosity of the Carnegie Corporation of New York, and was undertaken at the request of its President. Three months were spent in Australia, and somewhat less than two months in New Zealand. In these periods it was impossible to examine in detail all sides of technical education in the six Australian States and in New Zealand. However, I believe that I saw examples which were both representative and illuminating.

In so far as I have written adverse criticism, I am sure I shall be understood as well as forgiven. No peoples are more candid than Australians and New Zealanders. What they claim themselves they will, in accordance with their tradition, allow to others. It will be clear from the report that in the technical education of both Dominions there is much more to admire than to criticise; and nowhere have I been more impressed than in these Dominions with the energy and the devotion with which this work is carried on, often under difficult conditions.

The universal kindness and consideration, the willing help, the magnificent hospitality which I enjoyed I most heartily and gratefully acknowledge, and shall never forget. The important result of a somewhat strenuous journey of investigation is the permanent friendships I formed and hope to maintain. I record my grateful thanks to state officials, principals,

teachers, and to many others interested in the aspect of education with which this report is concerned.

Perhaps it is worth adding that I had hoped to provide fairly comprehensive statistics of technical education. I found, however, that to give educational statistics of the Dominion of New Zealand and of the various States which make up the Commonwealth of Australia would be most misleading. Even the categories of schools vary from State to State, and I found that to compile statistics on any basis common to the various States, and if possible to Great Britain also, was quite impracticable.

The best tribute I can pay to friends in Australia and New Zealand is to say, as I can and do, with emphasis and sincerity, that I should like to visit them again free from responsibility and with larger leisure.

F. H. SPENCER

30th September, 1938

CONTENTS

I

GENERAL INTRODUCTION

I

GENERAL INTRODUCTION

THE educational system of a nation is a part of its social organisation, and is determined, therefore, by all the material, spiritual and intellectual circumstances of its growth. Australia and New Zealand are British Dominions, peopled almost exclusively by men and women of British origin. Emigration to them was not a product of political revolt or religious dissension. In Australia the penal settlements doubtless included many whose offences were, judged by today's standards, trifling as crimes, whether political or social, but doubtless also many convicts of a forbidding type. Even before the supersession of transportation as a criminal punishment, the convict, mild or desperate, was absorbed into the overwhelming numbers of emigrants who had left their country for their own good. New Zealand, of course, was settled only in the early nineteenth century, and from the first by voluntary settlers.

The only real significance of these historical facts today is that Australia started by being governed authoritatively from Whitehall; it attained self-government first through the particular states centred on original ports of entry; and finally and recently attained the status of an entirely self-governing Federal State, bound to the British Commonwealth of Nations only by a common allegiance to the Crown, and by affinities of spirit and of blood which, consciously, or, as often as not, subconsciously, can be seen in daily operation. Australia and New Zealand are nations, rightly aware and

rightly proud of the fact. An Englishman, on landing, finds himself automatically and instantaneously adjusted to the life around him, though conscious of the differences which are immediately visible. The typical Australian or New Zealander is of the second, third, or fourth generation in his country. Sunshine, food, soil, space, employment have done their work. The Australian is as Australian in physical appearance, in speech and in other ways, as the Briton is British. The same is true (though the external differences are less) of the New Zealanders. One is soon convinced that in most important matters these differences are external. In mind and morals, outlook and tradition, the resemblances outweigh the differences. The intelligent will appreciate the significant fact that the coinages of all three countries are identical, though Australia has abandoned the half-crown whilst New Zealand has retained even that historical relic.

The British origins of the United States, still plainly to be seen, go back to the earlier half of the seventeenth century, but in Australia (and then in the earliest settled parts) only to the late eighteenth century and sometimes to the nineteenth. And some political consequences of this are interesting. The decentralisation of American and Canadian education which is ubiquitous, and quite possibly excessive, probably arises because the early Jacobean settlers took the English parish with them, and subsequently passed it on to Canada as the unit of self-government. The centralisation of Australian education arises out of the early authoritarian governments centred in Sydney, Adelaide, or Melbourne and at a period when the increasingly numerous emigrants from home associated the parish only with the relief of the poor and hated it: the later settlement of New Zealand and, perhaps, the rather later and more tentative provision of education in New Zealand, first led to the institution of school

boards more or less on the English model, and then to a gradual recentralisation. In England, for the first half of its deplorably short history of popular education, the detailed administration of particular schools by a centralised government was both impracticable and against the spirit of the times. But as the process of Australian settlement grew outwards from the state capitals such detailed administration was easily possible. And the state governments continued the centralising traditions of the 'Colonial' period. The English system of paying grants from the centre and remitting the administration of a particular school or group of schools to the circumference, grew naturally into a system of local education authorities. In Australia there could be no such growth because central administration adopted a system of provision not of aid to voluntary bodies, and the population and its distribution remained such that central administration was quite feasible. Thus the need for any alternative to the central provision by each State never arose. In each State the limited task could be performed by the State Government.

Such, I think, is an approximately correct explanation of the centralised system of educational provision and administration which is characteristic of Australia and, to a rather less degree, of New Zealand. Education, except for a few older foundations and private schools, is a matter for the respective State Governments in Australia and, in New Zealand, for the Dominion Government. On the one hand it is outside the function of the Commonwealth Government, on the other hand the local governing bodies within the states have no formal concern with it. This is completely true of Australia, and substantially true, at this moment, of New Zealand, though a project for creating areas in New Zealand to which real responsibility for educational administration

may be devolved is at the moment of writing before the New Zealand Parliament.

The first impulse of the visitor is to criticise adversely the centralised system of the Australian States. This, apparently, has sometimes been done without discrimination, and with little appreciation either of its historical causes or of its present advantages. Enough (possibly too much) has already been said of these causes, but as technical education in Australia, and to a rather less degree in New Zealand, is as centralised as any other form of education, a brief consideration of facts and effects, good and bad, seems to be worth while.

Centralised administration is impossible for many services in thickly populated countries. It is possible for a department to provide and to control in detail, say, a thousand schools. This is done not only in an Australian State, but in America, in England, and in Scotland. But it is not possible for a central department to administer directly thirty thousand schools. The total population of Australia is somewhat less than seven millions. This is less than that of Greater London or Greater New York. To stick to the British examples well known to me, the London Local Education Authority (i.e. the London County Council) maintains and controls in detail all public educational service for a population of four and a half millions. Had the project for a Greater London come to fruition, it would have controlled education for a population of over eight millions. As it is, the London Authority administers directly more than two thousand primary schools, together with hundreds of other schools and educational organisations (excluding the University) for higher and special education of all types. This is a far larger task than that of any single Australian State. The largest State (New South Wales) has a population of about two-and-a-half millions. Thus we have in London an authority with

an administrative task, performed centrally, twice as big as that of any Australian State. This is also true of New York. In fact cities of the order of Liverpool, Glasgow, Birmingham run a centralised educational administration for a population of a million people, i.e. much larger than four out of the six Australian States, and approximately half the size of the two largest. Similar facts are true of at least half-a-dozen of the populous English counties. The British cities mentioned (and the half-dozen others of the same order of size) are, of course, local authorities under the control in some matters of the national Board of Education and recovering half of their approved expenditure from the central Government. But in all administrative matters (as distinguished, for instance, from detailed control of curriculum) their system is as completely centralised as that of an Australian State. The difference is that they are local not national communities, and that every local community above a certain size exercises similar powers.

The difficulties of local devolution in Australia are, in fact, very great. West Australia has a vast area many times the size of Great Britain. Its population is under half-a-million, more than fifty per cent. of whom live in or about Perth. There is no provincial town in Western Australia, South Australia, Queensland, or Victoria which, if it were in England, would be constituted a local authority for all educational purposes. In the whole of Australia outside the capital cities I can think of only one city, Newcastle, N.S.W., which in England or Scotland would have the educational powers of a county borough, that is to say, would administer both primary and higher education. In the State of Victoria, the area of which is approximately the same as that of Great Britain but which has a population of just under two millions (just about the same as the County of London South of the Thames),

there are only three towns of as much as thirty thousand to forty thousand population. In England these would be autonomous for elementary education only. It may fairly be concluded that, were it desirable, the task of administrative devolution of education, and especially of higher education, in the Australian States is not an easy one. And it is, of course, quite contrary to a now well-established Australian tradition.

In New Zealand the case is somewhat different. There, in the one State, are the four principal cities, none of them so large relatively to the total population as the Australian capitals. The number of smaller cities in New Zealand is relatively more considerable than in Australia, and the whole area of the country relatively to the population much smaller. Moreover, there *has been* devolution in the past in New Zealand and traces of it remain. It may again be reestablished in a less parochial and more practically feasible way.

It will be seen therefore that the centralisation of education in Australia is the product of historical and practical causes. It has advantages. The teaching service of an Australian State is one service. The back blocks may get as good a school and as good a teacher as the capital city. The problem of the backward authority does not exist unless the state itself is backward. The problem of staffing remote schools is simple. And the good teacher 'banished' thither has always the prospect (often in fact realised) of coming back to the capital city after his service in more remote regions. The questions of salary and equipment and the provision of school materials can be settled on 'State' principle and not on local practice. The teacher is free from the possible tyranny of a local and very parochial master. For the small authority has been known, elsewhere, to exercise its powers in far from commendable ways. The picture of a

small community vigorously, wisely and generously pursuing educational progress has not been (and is not) universally true in England, and I believe there are exceptions to it in America. Broadly speaking, the Australian (and probably also the New Zealand) teacher wishes to remain the servant of the state, and to retain the possibility of transfer. In general, what he (or she) desires is transfer from the circumference to the centre, though in fact he may be transferred on short notice and against his will from the centre to the circumference.

The disadvantages of the Australian type of centralisation are not exclusively to be found in the absence of local responsibility for schools, with an accompanying lack of local interest. Local interest is naturally less than in countries where schools are locally managed and, in part, locally paid for, but it is not by any means entirely absent in Australia, and still less is it so in New Zealand. There are a good many cases where to my knowledge a locality has raised a fund towards the building of a local technical school, demanded officially by a local governing body, though such a contribution is as a rule a small fraction of the total initial cost. Whilst I was in Melbourne a citizen offered a personal gift of £20,000 for a new type of trade school, and there are cases of technical institutions (e.g. a large domestic college) being founded by individual donors. Furthermore, parents' associations are quite common, and they frequently make gifts, usually of minor supplementary equipment, to the schools. Nevertheless, except for the Governors of some older foundations, which are aided but not maintained by the state, there is no local body which possesses real responsibility for any part of the educational provision in its area. This, so far as it could be avoided, is a disadvantage. But as local responsibility for management would inevitably be accompa-

nied by local responsibility for cost, I think there is little doubt that the typical Australian (and to a less degree the New Zealander) acquiesces in the present position. There is in Australia, perhaps especially in New South Wales, a disposition to devolve some real powers upon local advisory committees, at any rate in connection with the technical colleges. But at present this does not even extend to the appointment of part-time and occasional staff. The likelihood of their obtaining extensive powers of control is small.

The gravest aspect of centralisation is the tendency, only slowly diminishing, to uniformity of curriculum and its treatment. This finds its worst features in the primary school and probably also in the high schools. Though annual examination has gone, at a much later date than at home, the tendency to uniformity of curriculum is still there. No system is without its compensations, and various advantages of a set programme, with set books and so forth, are put forward by apologists for the existing degree of uniformity. Nevertheless, it remains true that the best work will never be got out of the teachers as a whole, and especially out of the best of them, so long as they have to follow a curriculum imposed from above. It is true to say that the English 'elementary' schools offer almost complete liberty to the teachers and this liberty has during the last forty years been a principal condition of the enormous progress there made. The same is theoretically true of our secondary schools, though to a considerable extent (less however than in the Dominions) their theoretical liberty is much modified by examinations and the practical necessity to enter most pupils for external examinations, in the control of which the teachers play only a minor part. We are remedying this, I think, more rapidly than the southern Dominions.

The absence of local control is less disadvantageous in the

technical college than elsewhere. The technical college, if it is to live at all, must adapt itself to local industrial needs, and even under the auspices of a central department it does this. The main outline of technical education for an industry, such as engineering or one of the principal branches of the building trade, or some branch of agriculture, must be determined by the needs of the industry. The essential requirements of the engineer or builder are the same everywhere. It is in the methods of teaching rather than in its subject matter that originality can be displayed; and there is nothing to prevent this. Moreover on the technical side in most Australian States, e.g. in Victoria, where technical education, on the whole, reaches its highest Australian development, schemes of work issued by the department are framed after real consultation with representative teachers. So that in the internal economy of the technical college centralised administration cannot truthfully be said to have grave disadvantages.

Perhaps the gravest disadvantage under which the colleges labour, at least in some Australian States, and especially in Victoria, where it came most prominently to my notice, arises from the application to the teaching service of ideas relating to employment in general. This is the idea of the right of a qualified individual, at least in the Government service, to a regular progression irrespective of particular or outstanding individual merits or fitness. Of how this works out in the field of primary and secondary education I have little firsthand knowledge, though in some states it means that there can be no such thing as a young headmaster or headmistress. The fact is that, at least in some states, any teacher, not being of notable inefficiency, attains the post of a head of a primary school by mere effluxion of time. Such conditions do not apply to heads of technical colleges or junior technical schools, who to the best of my knowledge

are specially appointed, at least in principle, on grounds of fitness. But they may and sometimes do apply to assistant staff in technical and junior technical schools. Every teacher is placed on a classified list; his position on that list depends upon initial qualification, period of service, and on his efficiency as a teacher, as assessed by an inspector. In this connection efficiency appears commonly to have a negative meaning: the absence of inefficiency. Any teacher of normal efficiency progresses slowly up the list, which is published. Thus every teacher knows where every other teacher stands. When a vacancy for a post occurs and applications for it are invited, any teacher on this classified list standing above the person recommended for appointment may appeal. And there are many instances of such appeals. Now, at least in Victoria, there is a common list for secondary and technical schools. And any one on this list is 'qualified' to fill a vacancy in either type of school. The appeal lies, not to the Education Department nor to any one connected with it, but to the Public Services Commissioner, who, I understand, must prefer any qualified applicant 'higher' on the list to any 'lower' applicant, and this quite irrespective of any special qualification for the post. Thus in a junior technical school where a vacancy for a science teacher is advertised and a man with science qualifications is recommended for appointment, on appeal this appointment may be quashed, and the vacancy filled by a teacher having no specific qualifications for the post. If this principle of classification cannot be abolished, at least the technical service should have its own list. In present circumstances there is no guarantee that a post will be filled by the person best qualified to fill it. The system may be a protection against injustice or against jobbery, but it certainly causes much internal trouble, makes for inefficiency, and is without any educational justification.

The compilation of the list has the grave disadvantage of occupying a large fraction of the inspectors' time, and of successfully diminishing their opportunities to disseminate ideas and good teaching practice, and to act as the advisers of the schools. Much of their time seems to be given to the miserable business of compiling a noxious list.

In New Zealand there is a separate list for technical teachers and apparently it is the least complicated of the classification lists there in operation. In the primary and possibly in the secondary schools, however, the system results in the usual promotion by effluxion of time. Few persons become heads of primary schools until the time when, from their new Pisgah, they turn their eyes to the promised land of retirement. Furthermore, it results in the advertisement of vacancies being a shallow mockery. Persons in a given class on the list may be already in a school where the vacancy occurs but be employed in a lower class. In this case the post in the higher class is advertised, with the addendum 'teacher of the required class already in the school.' In other words, the post is to be filled internally and the advertisement is a mockery or, at best, a broad hint.

In view of the opinions of the teachers and administrators, this system of classification, which applies to rates of payment as well as to promotion, is hardly likely to be abolished. But in cases where the technical and secondary lists are one and the same, it seems that the case for their separation is very strong, and that this could be done without destroying the possibility of transfer from one branch of the service to the other. Educational considerations would, I think, point to the complete abolition of the lists at the earliest possible moment.

One matter in which Australia, like South Africa, is in advance of Great Britain is in the scheme for the supervision

of apprenticeship and for the compulsory attendance of apprentices at technical colleges or schools within their ordinary working hours. No such scheme operates in Tasmania, nor, with trifling exceptions, in New South Wales. New Zealand has no such provision, and there the argument is used that in view of the forty hour working week, it is unnecessary. In New Zealand voluntary classes are held on Saturday mornings.

The scheme is comprehensive and is perhaps especially well and thoroughly administered in Victoria and in Queensland. Queensland indeed claims to be the pioneer in this matter. It operates also in Western Australia and South Australia, and in my experience is well administered. Apprenticeship is controlled in detail. Each apprenticeship must be registered, and it is a condition of apprenticeship not only that the apprentice shall attend classes for from six to eight hours a week after beginning work, and that one half of this shall be in 'daylight,' that is, during ordinary working hours, but that the quality of the work done by the apprentice in working hours be regulated. He must be employed on skilled work and he must not be employed continuously on repetition work, or, as it is called in Australia, process work.

The system works well. It was initiated by 'proclaiming' one trade after another, the plumbing trade usually being the first. Today almost all skilled trades and engineering and the various building trades are included. It does not, of course, apply to office employment, nor to the large class of casual, miscellaneous, and unskilled occupations still entered by numerous young people, nor, to the best of my knowledge, does it apply to girls. Trade education for girls, however, is less fully developed in Australia than in England. In principle this scheme, which applies to apprentices only, and has not been made operative yet in all the small towns, is less com-

prehensive than the day continuation clauses of the Fisher Act of 1918 which is on the English Statute book. But the Australian scheme has become (outside New South Wales and Tasmania) almost universally operative, whilst with one noble exception, Rugby, the English scheme has, after a first large scale experiment, remained a dead letter.

It was pleasing to learn that wherever the Australian scheme has been applied the initial opposition both of lads and of employers was soon overcome. The apprentices now take it as a matter of course, and the vast majority of employers, converted by the results, have become strong supporters of the scheme. In Adelaide (South Australia) a special Technical College, a pleasing and well-equipped building, has been provided principally for apprentices. In Melbourne and elsewhere the Technical College and the branch technical colleges are used. And these apprentices, and especially those of them who have been students in the Victorian technical schools, are rapidly becoming the backbone of the technical colleges. The day course they take is predominantly a trade, or, as it would be called in England, a minor course. But there are plenty of examples of the trade student persevering and becoming a 'major' or diploma course student. There is little doubt that this wise and enlightened treatment of the apprenticeship question will do much to solve the difficulty of a sufficiently large skilled personnel for the secondary industries which Australia is developing and intends to reinforce.

Another feature of technical education in these two southern Dominions is the establishment and successful conduct of correspondence tuition by the state departments. The technical side is the most difficult aspect of this form of education. But in a majority of the States it has been tackled with success, whether administered by a central technical

college or conducted as a special feature of a correspondence school dealing also with primary and secondary education. In this way knowledge is made available for technical students in remote places, where even classes, let alone technical schools, are impossible. And in New South Wales this system has been reinforced by the organisation of a mobile workshop and technical laboratory, doubtless only the first of its kind.

Otherwise technical education in Australia and New Zealand, beyond the preparatory stages, is conducted by means of evening courses and classes very like those which are so characteristic of the English system. The junior technical school of the British type has been developed chiefly in Victoria, and the energy with which this has been accomplished cannot be too highly praised. Proportionately, the provision of this kind in Victoria is much greater than it is in England, except in the matter of trade schools for girls, which, however, exist in considerable numbers only in London. In the section of this report which deals with Victoria some adverse criticism of the Victorian junior technical school will be found. But, at least, it must be said that in the volume of its provision of this kind Victoria is well ahead of other States. The junior technical school, without some of the Victorian weaknesses, is also to be found in Tasmania. Elsewhere, provision of the full-time preparatory order (preparatory, that is, to skilled industrial employment as well as to real technical education) is provided in schools having various names, such as central schools, central junior technical schools, domestic schools, etc. Descriptions of these will be found in the sections on particular States. Nowhere is this preliminary form of technical education neglected. And with one interesting exception, that of the New Zealand technical high school, the Mother

Country has little to learn from the Dominions, except perhaps from Victoria in zeal. English readers, as well as Australian, will be interested in the account of the technical high schools given in the New Zealand section of this report.

With regard to the real technical education which is feasible under existing conditions only when working life is begun, Australia seems, on the material side, to have made less progress than has been made at home in the last few years. We have got rid of a large part of our old buildings, and have provided, especially in the newly developed industrial centres, some which are really well adapted to their purpose. But the principal technical colleges in Perth and Hobart sadly need replacement. And neither Sydney nor Melbourne can be proud of its Central Technical College building. They have been developed from an original nucleus in what appears to have been a hand-to-mouth fashion. They contain far too many over-large and inconvenient class rooms, and, whilst they cannot truly be said to be entirely unsuited to their purpose, they do not promote efficiency, they cause teachers and pupils, in too many instances, to have to work 'against gravity,' and they are unworthy of the vigorous and progressive life of the cities they distinctly do not adorn. The Adelaide School of Mines and Technical College, though old fashioned, is not unsuited to its purposes. The Technical College premises at Brisbane are good, and with the final transference of the University elsewhere will be better.

The best and most suitable buildings I saw were the newer branch technical colleges in Melbourne, some of which are architecturally excellent and practically well planned. So are some of the newer premises in New Zealand, whether at the larger centres, such as Wellington, or in the smaller towns. The best and latest buildings in Victoria and in New

Zealand will bear comparison very easily with any colleges of a similar type at home or abroad.

Equipment I found to be excellent. This is especially true perhaps in Victoria and in New Zealand, but speaking generally, none of the technical colleges in Australia lacks good equipment. What they sometimes lack is adequate and suitable space in which to use it.

Similarly, I think, there is no reason to believe that the level of teaching ability in the Australian and New Zealand colleges is inadequate. The general level, so far as I was able to form opinions, was distinctly good.

Two deficiencies are, however, notable. In Australia (but not in New Zealand) the provision of libraries is distinctly below standard, and in some instances, absent or farcical. This is as true of the full-time junior schools as of the technical colleges proper. In these schools too, especially perhaps in the two largest States, Victoria and New South Wales, classes of forty-eight were the rule, and I saw classes of over fifty in several instances. In one case I saw a class of a hundred drilled, of necessity, rather than taught. These numbers are far too high, and account to some extent for the fact that age for age the progress of the pupils in Australia seemed to me to be behind that at home. The standard class in an English junior technical school is thirty, and I have hardly known it to be exceeded. Junior technical school work cannot be done, whatever the convenience of the building or the adequacy of the equipment, with standard classes of forty-eight.

Finally, among administrators and teachers, and in an increasing degree among a large section of the parents, the need for a rational system of technical education is now fully recognised. If it ever was, technical education in Australia and New Zealand is no longer the Cinderella of the educa-

tional service. For instance, the prestige of the junior technical school in Victoria and elsewhere has risen and the demand for such schools has risen with it. The time has not yet arrived, either in Australia or in New Zealand, when the pick of the primary school students apply for entrance to a junior technical school or a technical high school, but the standard of the entrants as well as their numbers is rising; and if service by teachers in a post-primary school of this kind is not yet on the same level of prestige as service in an academic high school, at least that prestige is rising.

In the advanced part-time work carried on in the technical colleges, the volume of work is increasing continuously and both in Australia and in New Zealand there are many instances where the numbers of the students are much above the accommodation provided. For this reason among others the rebuilding of the Sydney Technical College is projected, one section of a new college at Newcastle has been erected, and whilst I was in Melbourne an additional block at the Central Technical was in progress, whilst more than one branch technical college had very recently been completed. The new Technical College at Yallourn in Victoria is already too small for the number of students enlisted. These instances are but evidence of a healthy public demand, and also of the realisation by the several Education Departments of the importance of the problem.

Perhaps some further publicity is needed in many parts of Australia to arouse the general public and some sections of the employers; but both employers and employed are rendering good service, of which I was personal witness, by serving on advisory committees for particular schools and colleges, and on those relating to apprenticeship for, or instruction relating to, particular trades.

In New Zealand there is some demand, not yet very vocal,

for an increase in the number of technical high schools. As to whether there should be more than one of these in each of the four principal centres I have not enough knowledge to form an opinion, though I think each of the large schools there has reached, if it has not passed, its optimum size.

There is indeed the danger in New Zealand, where today higher education is practically free for those who care to follow it beyond compulsory school age, that in finding schools suitable to the unselected mass of entrants the interests of those qualified for the highest kind of non-vocational education may be neglected. Unless special pains are taken, secondary education for all, in a non-selective system, may become, in the stricter meaning of the term, dangerously near secondary education for none. As one convinced that a vocational training for the right people (and these are numerous enough) at the right time is a matter as important as it is valuable, I think it proper to call attention to the fact that 'man does not live by bread alone,' and those whose capabilities and probable destiny involve and require a cultural education of the stricter kind should be eagerly sought and carefully nurtured.

Another matter seems worthy of attention. The technical college, at least outside the great cities and sometimes within them, is the only permanent centre for any educational work, in the broadest meaning of the term, available for a local population outside working hours. There are many people inclined to some definite course of study of the non-technical order. Indeed, these often include former technical students, who have gone as far as they can go or wish to go in technical instruction. At home the technical colleges have done something to offer non-technical studies in the field of history, literature, art, political science and the like. In London a whole series of literary institutes, the activities of which are

by no means confined to literature, have been organised; and of men's institutes, where classes of all kinds, including the intelligent study of hobbies, are offered.

Some of this work both in Australia and in New Zealand is doubtless done in the evening classes offered by the universities. But they by no means exhaust the field, and there is work to be done of an order for which the university teacher may not be the most suitable exponent. Moreover, the universities exist only in the largest centres. It seems, therefore, to be a matter for consideration, whether the Department should not, in the technical colleges, or in connection with them, do something to satisfy the existing demand for 'education' of this type, and even do something to stimulate it where that demand is, as yet, only potential.

I am aware that there is an adult education movement both in Australia and in New Zealand. But nowhere in the Dominions or at home do either the universities or bodies like the W.E.A. satisfy the whole demand, especially in its less permanent and continuous but nevertheless important manifestations.

II

AUSTRALIA

II

VICTORIA

Full-time Instruction

TECHNICAL education in Victoria consists of both part-time and full-time instruction. The full-time day instruction in its earliest stages is carried out in junior technical schools. Of these there are about thirty in Victoria and twelve are in Melbourne itself or in the immediate neighbourhood. Each of the principal towns, such as Geelong, Ballarat, and Bendigo, has a school of this type, as have smaller places like Yallourn, whilst there is at least one village school of the same type.

The qualification for admission to the junior technical school is that a boy shall have passed the sixth grade. There are a few similar schools for girls which, in fact, are called "girls' schools," and have a strong domestic bias, but the problem of day trade schools for girls has not yet effectively been attacked.

The junior technical school proper is, at present, a boys' school and it offers a three years' course. The normal age of admission is about 12, but as the compulsory school leaving age is 14 and opportunities for employment are many, a majority of the pupils leave at or soon after the age of 14. In most of the junior technical schools visited not more than from 30 to 40 per cent. of the candidates completed or even entered the third year and the lower figure is the more usual one. For a majority of the pupils, therefore, the range of age

does not go beyond the English elementary school leaving age. In this respect the Victorian junior technical school differs entirely from the English school of the same name, where the usual age of admission is 13½ to 14 and the age of leaving from 15½ to 16. The schools in Victoria are free up to the age of 14 but beyond that a fee is charged, and this may have some influence in determining the normal age of leaving.

The obvious criticism of the junior technical school in Victoria is the early admission age of the pupils. Actually, if the curriculum is examined, there is less substance in this than might be supposed. The school week consists of forty periods, making up about thirty hours altogether. Of this time five periods are given to English—three to history and two to geography. In fact the curriculum differs from that of the secondary pupils of the same age range chiefly because in the junior technical schools eleven periods are given to practical work whilst in the secondary school about nine periods are as a rule given to foreign languages. The true comparison between the Victorian junior technical school and any English institution is with the new senior schools of England, where an attempt is being made to introduce practical work for a relatively large period of the school week, with proper accommodation and appliances for that work. The Victorian junior technical school does for certain pupils what the senior school in England is intended to do for all. The great advantage of the Victorian junior technical school is that it is always held in a technical school building and has ample, and often more than ample, equipment and space for the manual side of the instruction. Viewed even as a preparatory technical course, the drawback of the junior technical school, as it exists, is that the boys leave at a not much higher age than would be appropriate to entry. At

present, perhaps, the most outstanding merit of the junior technical school is that most of the pupils on leaving attend the part-time classes, chiefly as apprentices under the scheme described below, and enter apprenticeship not ill prepared.

In some of the technical schools or colleges there is a senior course of two years ending on to the junior technical school, but this is by no means universal. It is naturally almost purely technical in character. In the Central Technical College, Melbourne, and in one or two of the other technical colleges, there is also a diploma course which is full-time instruction extending over three years. In actual fact the senior course serves the purpose of filling a gap between the junior technical school course and the diploma course. The diploma students are doing work of an advanced character on the theoretical side with a good deal of practical illustration; and, at the termination of their course, I am assured, there is no difficulty at all in placing the students, who have as a rule followed a full-time course up to the age of eighteen or more. The course I saw at work seemed to be excellent.

Part-time Instruction

In Victoria apprentices in practically all skilled trades are by law under an obligation to attend technical colleges for eight hours a week. Of these, four hours are during the working day, or, as it is commonly put, in 'daylight,' and therefore in the 'employer's time,' and the other four are taken in the evening after working hours. This system was started some five or six years ago and one trade after another was 'proclaimed.' Thus the system has been built up year by year. In these 'proclaimed' trades young employees must be engaged upon skilled work and receive a proper training. The employer is responsible for the attendance of the

apprentice at school. A fee is charged, usually about thirty shillings a session of three terms. This fee is payable in the first instance by the apprentice, but is always repaid to him by the employer if satisfactory attendance has taken place. The method of inaugurating this system by proclaiming one trade at a time seems to have worked very well, and the scheme now has the solid backing both of the employers and their organisations and of the workmen, whilst the apprentices themselves have got over any original objections to the system and attend willingly. I saw a good many examples of apprentice classes and in none did I see any signs of disorder or unwillingness on the part of the students to observe their obligations. On the contrary, the visitor is struck by the interest and attention of the apprentices. Similarly the evening attendance of these apprentices seems to be very good, and it is highly probable that, in the future, the backbone of the technical colleges, or at least of their part-time work, will be formed by the attendance of these apprentices.

In addition to the classes for apprentices there are the usual part-time courses for all the skilled trades in the various technical colleges, including the Central Technical College. The evening courses as set out in engineering, building, the chemical trades, printing and so forth, closely resemble those which we have in Great Britain and the standard of work is comparable. There is, of course, a larger attendance in the earlier than in the later years of these part-time courses but quite a number of students were seen who were completing what in England would be called an advanced course, implying some five years of continuous attendance.

The Central Technical College

The centre of the system of technical education in Melbourne itself is the Central Technical College, a large insti-

tution numbering some ten thousand pupils all told. It is excellently managed and its major defects are on the material side. Starting originally as a working men's college, it has been built up over a series of years in 'units' or sections. Broadly speaking, each group of trades has its separate building—engineering in one block, building in another and so on. The buildings themselves are not too convenient, many of the class rooms are very large and by their existence encourage very large classes. There is little attempt to make the buildings even seemly, still less beautiful; they are rather grim and forbidding. Some new buildings are in course of erection. It is evident, however, that whenever financial conditions permit the older buildings, which are inconvenient and unsuitable, should be replaced by a technical college, convenient for its purpose, and worthy of a great city.

A reorganisation is in process whereby the first three years of the part-time technical courses will be carried out in the suburban technical colleges, of which there are about a dozen, whilst the Central Technical College will confine itself to the advanced work. This, if properly administered, is certainly a step in the right direction, for large numbers of the students now in attendance are in the early stages of their technical education. It also renders it all the more important that a suitable and dignified building should be provided. The existing premises are neither the one nor the other. The ten thousand students, largely in voluntary attendance, spending their evenings in study against the temptations of the beautiful Australian climate, require at least as seemly premises as those of some of the admirable high schools.

Administration of Education

Before proceeding to detail, some remarks on the administration of education in Victoria are perhaps desirable. It is commonly held, and indeed it is true, that in Victoria as in Australia generally the control of education is highly centralised. The system is a state system, administered, under the control of a minister, by a department of the government of Victoria. There are no local authorities in the British meaning of the word, or, in fact, in any other meaning. Except for some schools founded at an early date by pious donors and retaining some independence, all schools are provided by the Department of Education, staffed by it, inspected by it and controlled by it. The semi-independent or aided schools have a council which appoints the staff, but are also in most respects under government control. The allocation of time, for instance, in the junior technical school is fixed by the department. The syllabuses to be followed are uniform and universal. These syllabuses, however, are not constructed by the officials of the department alone, but have been framed by committees including officials, inspectors and representative teachers. The schemes of work purport to be for guidance only, and occasional departures from them by enterprising teachers do occur; but in practice they are almost universally regarded as fixed. Similarly the teachers are civil servants, appointed by the State, though in some cases, as has been noted, e. g., that of the Central Technical College, the older schools have a council and can appoint teachers subject to the veto of the department. Such a system certainly has its drawbacks, and one gets the impression that education in Victoria is much more regimented than anything we have in Great Britain.

On the other hand, it must be remembered that the popu-

lation of Victoria is just under two millions. When we say therefore that the system is a state system, it must be remembered that the State consists of two million people. A local authority like London has to provide education of all types for a population of nearly four and a half millions. A large city like Birmingham or Liverpool controls centrally the education for a population of about a million, and a large administrative county like Lancashire or Kent will carry on work of similar dimensions. It is clear, therefore, that, after all, the centralised system of Victoria is centralised only for a population less than half of that of London and not twice as large as those of Birmingham, Liverpool or Glasgow. There are three considerable towns, Ballarat, Bendigo, and Geelong, none of which has a population greatly exceeding 40,000. Hardly any other town has a population exceeding 10,000 to 12,000, and there are very few of this size. It is difficult therefore to see how local education authorities could be created.

Again, it is not true to say that there is no local interest in education. It has already been remarked that some of the older technical colleges were founded by individuals, groups or municipalities and have only partially and recently been taken over by the government. But some interest and, indeed, initiative, still exists. A local district, for instance, anxious to obtain a junior technical school for itself, will often give a site and sometimes contribute such a sum as £2,000 towards the cost of building. As I have already mentioned, a citizen of Melbourne recently gave £20,000 towards the cost of a new junior technical school for the catering trades. The technical colleges, too, have councils and on these councils the local governing authority is usually represented. Nevertheless, it is true that the local council has no authority in education, does not raise an educational rate,

and is in no way financially or administratively responsible for the conduct of schools.

Even were it my function to do so I should not be disposed to advocate the devolution to local authorities of responsibility at present borne by the Department of Education. Should the population of Victoria, at least half of which is already to be found in Melbourne, increase so as to make the towns or counties considerable centres of population, the necessity for devolution and some measure of local 'freedom' and responsibility will arise. But this is looking far ahead. At present the centralised administration, conditioned by the history of Victoria, is, so far as one had opportunities of judging, efficient and inevitable. It arises directly out of the political history of the State.

I think the most practicable line of advance would be gradually to liberalise the regulations governing the curriculum and the allocation of school time in the full-time schools. The explicit regulation of the junior technical school curriculum, probably justified during the foundation of the system, should be relaxed with the growth of that system, and experiment and responsibility should be encouraged. It is probable that the present time distribution would not be departed from considerably and there is already room for originality of treatment. This could be increased if the teachers were encouraged more and more to construct their own syllabuses, though it must be remembered that through representatives they already influence the construction of the syllabuses common to all schools. Latitude in the construction of time tables is desirable for its own sake. Minimum times for subjects might be prescribed and the rest left to the head teachers. The teachers should be encouraged to realise that independent thought and action is not merely a name but a reality.

The Appointment and Classification of Teachers

There is a further point of great importance which arises out of the Victorian administration. This is the appointment of teachers. In a few cases such as the Central Technical College, Melbourne, where the technical school owes its origin to individual or local effort, preceding the government provision of technical education, the schools or colleges can appoint their own staff after public advertisement, and the teachers so appointed are the servants of the school or college council and are not direct employees of the State. But in all other cases where the Government has itself organised or acquired the institution, and these are the majority, the teachers are direct state employees, appointed by the department, each appointment being initialled by the minister. They are appointed to the service, not to particular schools. And they can be sent from one place or school to another at the will of the department.

Moreover, they are 'classified' by an official classifying board, and the permanent teachers in the technical colleges and in junior technical schools rank in the same list as the secondary or high school teachers. If a post is vacant, the department, according to the best of my information, acting through a small committee consisting of the administrative officer in charge of technical education, an inspector, and the head of an important technical college, selects the best man from among applicants (necessarily confined to the State teaching service), and recommends an appointment to the minister. But any candidate for the post has the right of appeal to the Public Service Commissioner, an officer outside the education service, to whom the nearest but imperfect British analogy is the British Civil Service Commission. If the appellant is senior (i. e. higher on the classified list than

the recommended appointee), the Public Service Commissioner may over-rule the proposed appointment, and, in fact, apparently must do so. As appeals are not infrequent the result often is that the candidate best suited to the post is not appointed; and I gathered a good many instances of unsuitable appointments resulting. In one case a vacancy for a science teacher, as a result of this procedure, was filled by a teacher whose qualifications were in art. Mechanics or physics not being as a rule the strong suit of a man brought up on painting or modelling, the results may be left to the disciplined imagination of the reader.

If the permanent staffs of the junior technical schools or the technical colleges are to be efficient, it seems to me either that the system of classification, which seems to the friendly stranger unnecessarily elaborate in its constitution and disagreeable in the mode of its computation, should be abolished, or, at least, that the technical service should have its own separate list, based upon a few simple principles.

General Observations

I candidly admit and greatly regret that the conditions of time imposed on me by circumstance did not permit anything like so close a study of the technical colleges, junior technical schools and other institutions forming part of the provision of technical education in Victoria or, indeed, in any Australian State. I can only plead that this is my misfortune rather than my fault. The whole of the three months I was able to spend in Australia would have been suitably devoted to an intensive study of the provision made in a single state, and this more intensive study would have been in accord with my disposition, and indeed with the sound tradition of limiting the task and doing it thoroughly. It must further be remembered that technical education has a most complicated

subject matter, and no one person, however experienced, can evaluate the treatment of, say, mathematics, physics, chemistry, shorthand, building construction, or, on the practical side, fitting, turning, bricklaying, cabinet making, smithing and foundry work. All a single person can do is to look closely into what he understands and bring his best experience and such sagacity as he can command to bear upon the rest. What I write below must be read in the light of these observations.

The Technical Colleges and Branches

I think Victoria may well be proud both of the extent and of the quality of its provision for technical education in these major institutions. There is, so to speak, a greater mass of technical instruction per thousand of the population in Victoria than anywhere else in Australia. Melbourne, besides its large Technical College (still, incorrectly, called by middle class Victorians "The Working Men's College"), is admirably equipped with branch technical colleges, conveniently situated in and about the city. In this respect it compares favourably with any British centre, and with the provision made in any urban area in the Dominions or elsewhere. Those who designed and executed this part of the educational structure of Victoria deserve well of their fellow-citizens.

As already remarked, the Central Technical College requires and deserves ampler, better, and more suitable buildings. It would be an exaggeration to say that the present buildings are disgraceful. But some of the older portions are unsuited to their purpose, many of the buildings are inconvenient, supervision of the work must be most difficult, many rooms are much too large for class teaching, and they invite the over-large classes, which are far too common. To take an extreme case, I saw one hundred girls taking shorthand in one class. This reduces the art of teaching to a process of

drill, and negatives any real touch between the teacher and the pupil. Classes of fifty are not uncommon. The buildings of most of the branch colleges are good, and the newer ones are excellent in design and equipment.

On the whole, the equipment on the practical side for the principal trades, such as the various branches of the engineering trades, is good. To the best of my knowledge there are no major deficiencies. And the part-time apprentices taking 'trade' courses, and the more advanced students engaged in the important diploma courses, seemed to me to have at least reasonable facilities for their work.

Trade and Diploma Courses

The 'trade course' is a course of a predominantly practical order, usually consisting of practical work occupying half the time, with drawing, trade calculations, and trade 'theory.' The theory appears really to be descriptive information (nature of materials, tools, their variety and purpose and the like). Such courses form a bigger fraction of the work than would be the case in a British technical college of the same order. The British tradition is that technical education exists for the purpose of enabling the student to study the science (mathematics, mechanics, physics, chemistry, solid geometry or technical drawing) relevant to the student's daily work, i. e. the forms of knowledge which he cannot acquire whilst at work rather than the practical skill or craftsmanship which he can. But in England, too, owing to the increasing subdivision of factory work, the need for courses the principal aim of which is to increase the skill and widen the practical experience of the 'apprentice,' whether or not indentured, is becoming daily more apparent. And 'minor' courses parallel to the Australian trade course are increasingly in vogue. There is no doubt that the trade course in Australian condi-

tions is highly desirable. And by its organisation of part-time instruction for apprentices, a side of the work in which not only Victoria but all Australian States, save two, are much in advance of the Mother Country, Australia is laying a sound and most desirable foundation for the progress of those 'secondary' industries the establishment and extension of which it so much desires.

In the diploma courses, which closely resemble the 'major' course of the British system, the standard of work in Victoria, wherever I was able to judge of it, seemed to be very satisfactory. At the Central Technical College pains are taken to obtain competent instructors, and though there is sometimes difficulty in this respect, as the area of choice is necessarily limited, I was impressed by the general level of teaching competence, though there were of course cases where a higher level of knowledge or teaching ability was plainly desirable. Broadly speaking, however, the work of the pupils and of the teachers was distinctly good. And my general verdict on the part-time work both in the Central and in the branch colleges would be a very favourable one. At its best the work is of the same order as in the comparable home institutions.

Both in the trade courses and in the higher diploma work I am confident that the State and the citizens, in these inevitable part-time courses, are getting value for the money spent. So far as I can see, the work of the near future must be the building of a convenient and dignified Central Technical College worthy of the city, where students and teachers can work with, not against, gravity, and the replacement and reconditioning of one or two of the older and less suitable branch colleges.

Predominance of Evening Part-time Instruction

Apart from a relatively small number of full-time diploma students in the Central Technical College, all the real technical education of other than a preliminary type is part-time work, and most of the major course work is evening work. Under Australian conditions as to school leaving age and the age of commencing apprenticeship or other employment this is inevitable. Victoria like the rest of Australia has followed the British rather than the Continental or American tradition, as was natural and, perhaps, inevitable. The full-time trade school is a preliminary school. The young employee in general acquires his practical skill at work (though under conditions of part-time apprentice education he has effective means of supplementing this) and acquires his theoretical knowledge in part-time and usually evening classes. But England is already raising the compulsory school age by a year, and it is beginning to wonder whether its existing system of technical training, efficient as it has been under a régime demanding workmen of all-round skill, will remain suited for a manufacturing system based so largely upon the semi-skilled repetition worker and the automatic machine. A young country like Victoria will also have to turn a critical mind upon the same problem, and this, in Victoria, is the more urgent, for it is without the large accumulated reservoir of traditionally skilled men which still exists at home.

The Merits and Defects of the Victorian Junior Technical School

It is necessary to make, in plain terms, one criticism of the Victorian junior technical school. This indeed is the more necessary because of the outstanding excellencies of the system in most respects. The organisation of these schools has

been pushed forward with exemplary energy. Relatively to the population they have been much more generously supplied than in Great Britain. No numerical comparison can be exact, because in London and some large provincial centres the partly vocational selective central school makes a most important addition to the facilities for preliminary trade training. And, in general, the variety of at least partial vocational training is greater in the old country than in the newer ones. But there is no doubt at all that Victoria has a real reason for pride in the extent to which it has called into vigorous existence a very necessary type of school. In general these schools are well housed, well manned, and certainly well equipped. Many of the Melbourne junior technical schools are carried on in large branch technical schools, buildings which, in the more recent examples, are models of school planning not excelled anywhere within my knowledge, whilst in no case can the accommodation be described as really bad. One consequence of this is that the equipment is, in general, excellent and is nowhere inefficient for it has to serve the apprentice as well as the school boy. Generally speaking, it compares very favourably with what is provided in British junior technical schools, and is much better than the normal equipment of a selective central school at home. Again the curriculum is suitable for a preliminary trade school. It provides for some ten periods devoted to 'humane subjects'; it includes reasonable time for mathematics, science, and geometrical drawing, subjects which are by no means treated from a purely vocational standpoint, and the 'bias' to be discerned in the teaching of these subjects, and their relation to practical work, adds in fact to their interest as a necessary element in a general education.

All this would be admirable were it not for two facts: (a)

In general the age of entry is about 12 and (b) the great majority of the students stay for two years only. It follows inevitably that the pre-vocational course in Victoria ends, for the very large majority of the pupils, at or about the age of 14, i. e., at the age at which school attendance ceases to be compulsory. In other words, a rather strictly vocational education terminates not much later than experience elsewhere shows that it can profitably begin. The British junior technical school has an entrance age of approximately 13½ years, and it terminates at 15½ or, in some cases, 16½, and the great mass of the pupils complete a course which is definitely a two-year or a three-year course. It is perfectly true that the curriculum of the Victorian junior technical school differs nominally for pupils of parallel ages in the high schools, chiefly by the substitution of practical workshop training for languages ancient or modern. But I imagine, and so far as I had opportunity observed, that there was a considerable difference in atmosphere, as, indeed, there should be were the pupils a little older. I am not convinced that for pupils aged 12 to 14 the technical atmosphere is the better of the two. It is also true that the practical work in wood or in metal done in the junior technical school workshop is always good and often excellent. I saw examples of metalwork, including for instance screw-cutting, which in correctness and finish were admirable. These results are accomplished by juveniles, at an age when even fifty years ago they were not allowed in civilised countries, including my own, to enter a workshop. The question is not whether the work done is good, but whether highly specialised manual work of a strictly vocational kind is desirable at this age, whether in fact the time so spent could not be better employed otherwise. This kind of work differs in principle and in purpose from manual work, having an edu-

cational rather than a strictly vocational purpose, which is properly included in the curriculum for pupils of these ages in most schools.

Admiring as I do the energy with which the junior technical schools have been created and supported, and believing as I do most firmly that, at the proper age level, they are a beneficial and indeed necessary type of school, I cannot resist the conclusion that the age of entry and the general leaving age are too low. One solution would be that the present entry age should be maintained, and the first year curriculum be made definitely less vocational, that the course should be made a real three-year course and an effective leaving age of fifteen established. If this could be done as part of a general rise in the school age to fifteen, so much the better. The principle of a statutory school age of fifteen is now enacted in Britain. In the easier atmosphere of a strong young dominion this surely could be accomplished, possibly without the loopholes which will, at first, probably be evident in the British system. In this matter the Dominions should lead the motherland. It was a little surprising to find that in this respect, as in other sides of social legislation, Australia is now no longer a leader.

Some careful attention to the humane side of the instruction given in junior technical schools is required. It was not possible for me to probe with any thoroughness into the quality of the instruction, for instance, in English. What I saw was not reassuring. The reading matter provided was meagre in quantity and sometimes sketchy in character. To have *Treasure Island* as a set book is in any case to be deprecated. Obviously it should be read rapidly for enjoyment. But that a truncated edition should be used, as I sometimes found to be true, is deplorable. The schools are not generously supplied even with class literature, and the libraries

with one or two possible exceptions are unworthy of the schools, and form a mournful and devastating contrast to the practical equipment. I left some of the schools wondering, too, whether the best teachers of humane subjects were attracted to the junior technical schools, and whether the inspectors, men of high technical qualification and undoubted efficiency and public spirit, paid sufficient attention to this side of the work. It might be wise if another inspector could be afforded, and there is much work for such an officer, to appoint some one whose duty it would be to care for and encourage this side of the work. The curriculum as far as its subject outline goes recognises that the junior technical pupil will not only be a workman, and probably a good one, but a human being with leisure, with aesthetic needs and, inevitably, with civic duties. In a junior technical school, for the very reason that it *is* technical, the humane side of the instruction should be taken seriously, should be strong, and should be in specially capable hands. The teachers engaged on this side of the work should be above the average of their kind, their importance should be recognised, and their efforts should be encouraged.

Conclusion

One side of the organisation of technical education in Victoria deserves prominent and, if it is not presumptuous, very laudatory notice. The great Central Technical College, with its ten thousand or so students, is supplemented in Melbourne by an efficient array of well-distributed branch or local technical colleges. These are independent institutions, organised and controlled by the State department and, though in proper touch with the Central College, not within its jurisdiction. There are a dozen branch colleges, some at least of them specialising in instruction demanded by the special

economic character of the immediate locality. Thus it is made easy for students in any part of the very extensive Melbourne area to attend evening courses. Similarly they are most useful in providing for the day attendance of apprentices which has been nowhere more effectively organised than in Melbourne. Apprentices may divide their day and evening work, attending in the day the college nearest their work, and in the evening the college nearest their home. And, as has already been said, nearly all of these colleges house a full-time day junior technical school. This provision is at once economical and efficient, for the premises carry a three period load.

Arrangements are now being made so that, in the matter of evening work, the Central College shall confine itself to the more advanced courses, and all the junior and preliminary students attend branch colleges. This, in the conditions of Melbourne, is administratively sound. Its full accomplishment will leave Melbourne on this side of technical education in a position admirable in itself, and able to challenge comparison with any other city of its size and character at home or abroad.

Outside Melbourne too, at centres like Bendigo, Ballarat, and Geelong, there are vigorous technical colleges which I regret that I was able to see only by sample. But the sample, in respect both of the technical college and (subject to criticisms already made) of the junior technical school, was pleasingly efficient. And the same is true of the one or two still smaller places I was able to visit. There can be no doubt that successful care and attention is being given in Victoria to this necessary side of education. It is administered by an efficient technical branch of the department; and, in my opinion, technical education demands, in a State like Victoria, the services of an administrative branch which has

knowledge of the subject and believes in it. Its defects are the defects of zeal.

SOUTH AUSTRALIA

It was unfortunate that during my visit to South Australia nearly all the full-time day schools were closed on account of the continued epidemic of infantile paralysis. I was able, therefore, actually to see only the instruction for adult evening students at the Central Mining and Technical College. But I was able to visit a good proportion of the schools, talk with the teachers, who were usually in attendance, and, of course, with the members of the administration, and thus acquire, at least in outline, a knowledge of the system.

South Australia, though very large in area, has a population of about 600,000. Of these, about 300,000 are resident in Adelaide or its vicinity. It is predominantly an agricultural state, though in Adelaide itself there are miscellaneous manufactures, including railway shops and the largest motor assembly works in Australia.

The Mining and Technical College

The most important centre of technical education is the Mining and Technical College, Adelaide. This is situated next to the University buildings, on a beautiful avenue where the Art Gallery, the Museum, and other public buildings are situated. The foundation of this institution preceded the government control of technical education and its government is still vested in a council and possesses a considerable degree of autonomy. There are full-time mining courses of some importance and diploma courses for engineering and other technical categories, and in the higher branches of this work there is cooperation with the University.

Within the building there also exists a large school which, on the one side, is the equivalent of a junior technical school and provides a three-year course. The point of entry to this school and to the one other junior technical or technical high school in Adelaide is a year later than in Melbourne—students enter from Grade VII as against Grade VI in Victoria. Thus the average age of entry is from twelve and a half to thirteen and a half, and the normal age of entry may be taken to be about thirteen. The curriculum is rather more liberal than that in Victoria, inasmuch as the individual pupils have some choice of subjects and those who wish eventually to matriculate may take a modern language in the school. The workshops and the technical equipment generally seem to be adequate, well arranged and not over-crowded, and the time-table for humane subjects is sufficient. For obvious reasons I am unable to offer any opinion about the efficiency of the instruction.

Within the same building there is also a junior commercial school. The pupils in this department are mostly girls. No modern language is taught, but English, history and geography are taught as well as the technical subjects, such as shorthand, bookkeeping and typewriting. Again a majority of the pupils leave at the end of the second year, and of the twenty-nine third-year students only six were boys. On the other hand, practically all these third-year students secured posts at the end of their third year. There is a higher proportion of boys in the first and second years, but the demand for boys as clerks is such that many of them leave in the second year soon after they attain the age of fourteen.

Some classes for apprentices are also held in the Mining College, and I was fortunate enough to see apprentices who were plumbers or motor mechanics actively and usefully at work. The equipment for metallurgy, mineralogy and

physics is very good, and metalwork of various types and woodwork seem to be satisfactorily provided for. There is also an excellent mineralogical museum.

Other Schools

I also visited the one other full-time technical day school in Adelaide. This is the Thebarton Technical High School. This school is directly under the department, but the headmaster, who seemed to be very capable, had a free hand in the arrangement of the curriculum. The curriculum in fact is a good deal wider than that of the ordinary junior technical school and again includes provision for those who wish to learn a modern language. Here again the three-year course tends to be truncated into two years, as the demand for boys is at present very active.

Other full-time education of the junior technical type is conducted in the central schools. The qualification for entry at these central schools is the same as that to the schools already mentioned, i. e. the seventh grade, and therefore the normal age of about thirteen. These central schools, though under the control of the Primary Education Department, are visited by the able Superintendent of Technical Education, who is a most accomplished scholar, the author of well-known books, and a part-time lecturer at the University. The supervision of the technical side of the work is safe in the hands of an unusually well-qualified and enlightened officer.

No doubt there is room in Adelaide for some expansion of schools of the junior technical type, but under existing conditions it cannot be said that a pretty liberal provision for full-time preliminary technical education does not exist.

I was privileged to visit the works of General Motors, where some six thousand men are employed. The authorities

at this works are very much interested in technical education, are keen supporters of the apprentice classes, and generally well disposed and helpful in all matters of education. Besides employing a large number of semi-skilled men they inform me that they require many men of the really skilled type and a large number of well-educated draughtsmen.

Outside Adelaide and its suburbs there are hardly any urban centres of any size. At Port Pirie, some one hundred and fifty miles north of Adelaide, there is a town of approximately twelve thousand population with a very important smelting works. At Port Pirie, therefore, a technical college has been established which provides day courses for apprentices and a good assortment of evening classes of the usual technical and commercial order. The smelting works supports the apprenticeship scheme and aids it in every way and also takes note of student work in the evening classes. There is no technical day school here. It is possible that such a school should be established and would succeed. Apart from this there seems to be no opening in South Australia for a technical school pure and simple. In a fair number of the smaller towns, none of which exceed about four thousand in population, the local high school or central school provides some technical instruction; and this seems to be the most workmanlike way of dealing with the problem.

The Apprentice Law and Its Administration

The Apprentice Law of South Australia seems to be well administered. Part-time attendance during the day is compulsory now in all the principal trades, including printing, engineering, building, painting and decorating, and so forth. To provide for these apprentices the State has built excellent premises, which are known as the Adelaide Technical School. The use of this school is confined to apprentices, the advanced

work being centred at the School of Mines. This technical or apprentice school is well laid out, in fact is an excellent new building, and properly equipped. The staff rightly consists of well-chosen skilled workmen and it was a pleasure to see the apprentices eagerly at work and acquiring skill of the kind supplementary to their ordinary day's work. There is little doubt that South Australia is doing a good deal to provide a future supply of all-round skilled men which will be very necessary with the inevitable development of secondary industries. The one present defect in this school is that some old stables are still in use for trade classes for boiler makers, welders and the like. A good deal of the work has to be done outside these stables, and the proper solution of this problem is the destruction of the existing old building and its replacement by suitable premises.

Compulsory attendance for apprentices is for three years, but there is a voluntary fourth year which most of the apprentices, with the help of their employers, do in fact follow. The Organiser of Technical Instruction has designed an excellent system of registration and of reporting to the joint bodies of employers and employees who control the system at the work end.

Instruction for the Unemployed

Another very pleasing feature of the work at Adelaide is the classes for unemployed men. A scheme for the education of the unemployed has been financed by the Commonwealth Government, and South Australia is, I think, the first of the States to get actively to work. A building hitherto used by an insurance company and in a central position has been acquired, the unemployed men who wish to better themselves are interviewed and are allocated to the trades for which they seem suitable. The men that I saw, of all

ages between twenty and forty, were busily engaged learning printing, carpentry, auto-engineering, painting and decorating, bricklaying, welding, practical electrical work and shoe repairing. They themselves have adapted the building and actively helped in placing the equipment, and have decorated the interior of the school. In fact their decorations have provided a pleasing interior which contrasts favourably with most of the schools I have seen elsewhere. They have christened their school The Grenfell Technical College, from the name of the street in which the building is situated. They give no trouble and one's general impression is that of eager work. As is so often the case, their attention to their job was quite undisturbed by the presence of visitors like myself. I was able to converse with a good many of them and carried away very cheerful impressions. Here, at any rate, the unemployed man is eagerly seeking to improve his qualifications for employment.

Agricultural Education

Agricultural education is provided by the Department of Agriculture. An agricultural college for the State was established in 1885 and has been successfully conducted until now. I had the pleasure of visiting this college, where there are about sixty residential students. There is a large experimental farm in which arable cultivation and the raising of stock are both successfully practised, and there is a suitable department for viticulture and a plant for making wine. The wine industry is very important in South Australia and immense vineyards are to be seen in the province, whilst at Seppeltfield is one of the largest and most important wineries in Australia. The agricultural college, though the number of its students seems not to be excessive, is evidently doing good work. It is controlled by a governing body consisting

mainly of practical agriculturists who take a keen interest in an institution which they rate highly.

Conclusion

Technical education in South Australia is necessarily of limited dimensions. Much of it I was unable to observe in action. What I did see was good. Certainly there is no departmental lack of appreciation of its importance.

WESTERN AUSTRALIA

The province of Western Australia is, in a sense, an outpost. It comprises an immense area, but a large part of it is entirely unsuitable for human habitation under present conditions. The population of the State is about 450,000, of whom more than half are resident in or about Perth. Such manufacture as exists in the province is carried on chiefly in Perth or in its neighbourhood. At Kalgoorlie, which is about three hundred and fifty miles north-east of Perth, there is the most important gold-mining centre in Australia. Fremantle, some twelve miles to the south of Perth, is an important port—all the liners call there—and it is the principal centre for the import and export of commodities.

Central Technical College

In Perth itself there is a Central Technical College which annually enrols nearly five thousand students of one kind or another. Considering the conditions in Western Australia this is, to my mind, a surprising achievement.

Among the day courses provision is made for full-time commercial instruction (a one-year course). There are practical courses for apprentices of all types—engineering, printing, woodworking, building, painting and decorating, and so

forth. There is also a Junior Certificate Course. This is of a general character for those students who have left day schools but have not yet entered into employment and may possibly wish to matriculate. There is also a definite matriculation class, and there is a small but well-managed course for advanced diploma students, chiefly in engineering. Under a scheme agreed between the school and the city pharmacists there are day classes in chemistry, etc., for the younger men qualifying for the profession of pharmacy.

The evening work, naturally, is the largest department of the technical college's activity. The present buildings will not accommodate all the students, and all first and second year commercial work is carried on in the Perth Street Secondary School premises. In the Technical College itself there are the usual evening classes in engineering, physics, classes for all the building trades, for boilermakers and metal-plate workers, and so forth. The provision is comprehensive, the College cooperates with the University in the advanced engineering work and the standard of work in the College generally on the part-time side is not dissimilar to that to which I have been accustomed in England.

The great need with regard to the Central Technical College and to the two branch technical colleges which I shall presently mention is that the buildings are most inadequate and inconvenient for their purpose. A part of the College proper consists of a converted grammar school in semi-ecclesiastical buildings erected about 1850, premises quite unsuitable for the purposes to which they are put. There is also a modern brick building, and for the rest, that is, for the majority of the work and nearly all the workshop activities, the College has to put up with old corrugated iron buildings on the unit system. These are over-crowded, ill-ventilated, ill-maintained and generally unsuitable. For instance,

on the motor-engineering side there is sufficient equipment for a really first-rate institution, but it now is crowded into one tin shed in which it cannot be properly used and in which the students are obviously working under great disadvantages. The same is true of the printing room; whilst the building used for painting and decorating is disgracefully inadequate for its purpose. This state of things is as well-known as it is indisputable. What is obviously required is the replacement of the present buildings on the same site or some other central site at the earliest possible moment. The attendance is good, the students are eager and industrious and in this department of education, so important if secondary industries are to be encouraged, the students and all concerned with the institution deserve far better accommodation. It is no exaggeration to say that the chief obstacle to the development of a sound and successful institution is this lack of suitable accommodation.

Other Schools

There is a branch technical school at Fremantle enrolling some six hundred students all told. Engineering, plumbing, various metal trades, building, and commercial work are provided, and one received the impression of a vigorous and healthy institution. A good technical school for Fremantle was designed before the War, but only one small wing of the building has been erected. Woodwork and metalwork are carried on in an ancient day school which is quite unsuitable for the purpose. Here again the crying need is for adequate accommodation for the numerous and very willing students.

A successful technical school is also carried on at Midland Junction. This is a railway centre where the State locomotive and rolling stock manufacture is carried on, and it is some fifteen miles north of Perth. The railway authorities

give the institution their vigorous backing. I had the privilege of seeing some of the day apprentice classes. The quality of the students was excellent, well up to and even above the average of what I had seen elsewhere in Australia. They were obviously hard at work and, until interrupted by speech, took not the slightest notice of visitors. All the skilled trades necessary to the work of railway shops are catered for and the day classes are supplemented by very vigorous part-time evening work. The school consists of four or five rooms on the first floor of a building which is also a railway institute of the social kind. I am credibly informed that were the premises adequate, the number, at least of evening students, could be doubled, whilst better arrangements could be made for the apprentice type of student for whom it is difficult to arrange any practical instruction supplementary to workshop experience. I was able to meet the Chairman of the Selection Board for Apprentices, who takes great interest in the school. Apprenticeship in the railway works is eagerly sought and the choice of apprentices is very carefully made. I also saw the chief mechanical engineer of the Western Australian Railways. He was most favourable to the proper technical education of the younger work people, and thoroughly agreed that the present premises were very inadequate.

It seems a pity, therefore, that in all three principal centres the work of technical education should be impeded by lack of accommodation.

Kalgoorlie, the principal gold-mining centre of Australia, is the seat of the State School of Mines. This is conducted not by the Education Department but by the Mining Department of the Western Australian Government. It is under the general charge, however, of the Superintendent of Technical Education, with whom I paid my visit. There are six hun-

dred students and the only subjects catered for are mining and engineering. The laboratory and practical accommodation is very good and there is an efficient outfit for assaying and research. There is also an excellent mineralogical museum. Day instruction is provided for those mining students who work the night shift. The principal is a well-known authority on all metallurgical matters, and the institution seemed to me to be most efficiently conducted. Whilst the practical accommodation is very good, there is a considerable shortage of class-room accommodation; and some of the evening classes that I saw, in mathematics particularly, but also in other subjects, had sixty-four or sixty-five students, thus precluding any kind of individual attention, to the great detriment especially of the slower students. If proper class-room space were provided, these classes could be halved and the institution made all the more useful.

The Boulder Technical School is situated close to the mines, some two miles from Kalgoorlie. Here a technical school is provided for the students in other subjects than in mining or engineering. Commercial work is carried on in the day-time and the usual evening classes during the evening. The building is convenient and sufficient but, like many other schools of the technical kind in Australia, it needs cleaning and re-decorating.

Conclusion

Those engaged directly in the administration of technical education in this State are not lacking in interest or in devotion. The department as a whole, however, seems to have let the material means of conducting this form of education lag much behind the rest of the system. Students are plentiful and eager, and proportionately to the size of the State the need for technical education is as great as it is elsewhere.

There is serious need for a new building programme. This is specially urgent in the instance of the Perth Technical College, and scarcely less urgent at Fremantle and Midland Junction.

TASMANIA

Whether viewed from the standpoint of area or population, Tasmania ranks with the smaller Australian States, though it is far from being the least interesting, and it is one of the oldest. Victoria was 'colonised' from Tasmania. It is, of course, predominantly agricultural; it has wide variations of elevation, climate and soil. It is a beautiful and interesting land of about the same area as Scotland; its population is about 230,000. The only large towns are the capital, Hobart (about 60,000), in the South, and Launceston (just over 30,000), in the North. There is a large production of metal, particularly zinc and copper, which are both mined and smelted. Otherwise, apart from a little ship-repairing at the ports and railway workshops, there are only miscellaneous small-scale manufactures.

Hobart

Technical education is provided in Hobart, in Launceston, and in certain smaller centres, and its conditions resemble most closely those of Victoria. The largest Technical College is that at Hobart, under the able direction of an accomplished man originally head of the art school, which is a department of the Technical College. The principal technical work, all the more advanced work, in fact, is evening work, and the engineering and chemistry instruction is carried on jointly by the University and the Technical College. There are the usual classes and courses in engineering, building and other trades as well as for commercial and office employments.

Neither in organisation nor in make-up do they call for special comment. The art department, having regard to numerical possibilities, is not only flourishing, but is conducted with a freshness and a freedom and a sagacious as well as modern outlook found only occasionally in Australia or New Zealand where, with a few notable exceptions, art instruction tends to be somewhat stiff and formal. There is a junior technical day school at Hobart, another at Launceston, and a good example at Queenstown, an important copper smelting centre, situated in a wild mountainous district nearly 200 miles from Hobart, and only recently made accessible by road. There are also evening technical classes in the smaller places. Mention should be made of the commercial high school in a suburb of Hobart which is housed in a really finely designed new building, and efficiently conducted.

The great desideratum is a new building for the Technical College at Hobart. There are eager pupils and a good staff. They have to work in what was originally a small building, designed no doubt for 'science and art' classes of the old South Kensington tradition, a building which has been added to as occasion seemed to require, until it is now a rambling, maze-like structure in which the students are bound to work in circumstances of great disadvantage. The provision of a really suitable technical college building, as good for its purpose as the new commercial high school, would be a good investment and seems to be called for urgently. The claims of the part-time student for accommodation in which good work is helped, not hindered, tend far too frequently to be overlooked. Part-time students anxious to improve themselves and their prospects, whose success in doing this contributes to economic welfare and has important secondary results on their lives as human beings and citizens, deserve as fitting and helpful surroundings as any other class

of student. It is impossible to believe that such claims will not be generously met at the first reasonable opportunity.

Junior Technical Schools and Part-time Education

The junior technical schools are, on the Victorian model, definitely vocational, but the entrance age is higher. There is a three-year course, but a large majority of the pupils complete only two years. The equipment is satisfactory, and at Queenstown the building is a good one. At Hobart the drawing rooms are good, but the school as a whole is housed in an old and unsuitable building to which attention is drawn above. On the technical and practical side, the instruction is satisfactory. English and the humane subjects receive adequate attention and are taken seriously. In Tasmania it can be affirmed that the junior technical schools are unpretentious and efficient and afford an excellent training of a very necessary type. Each school has its responsible headmaster, so that the principal of the college is free to carry on his proper work. At Hobart there are some 400 students, at Launceston over 200, and at Queenstown (population 4,000) there are about 80.

With regard to the part-time work which, in accordance with the Australian and British tradition, comprises all the more advanced technical education, it would be superfluous to repeat the descriptions already given. In Hobart, Launceston and Queenstown adequate provision for instruction in all the principal constructional trades is made. At Launceston some of the work struck me as less vigorous than it should be and as requiring a more adequate lead from the top. In Hobart and Queenstown, though the courses naturally and properly follow the approved fashion (though less overloaded than at Sydney), and though the quantity of advanced work is necessarily small, there was certainly no lack of enthusiasm

and the staff received enlightened direction and support from their leader.

In Tasmania there is no scheme of part-time day apprentice training.

Conclusion

Apart from the Hobart building and a certain lack of vigour in the conduct of the Launceston part-time work, the technical side of education in Tasmania seems to be creditable to all concerned with its organisation. It certainly does much to assure the future of the growing youth of the country, whether at home or abroad.

Finally, I must record my gratitude to the Education Department of Tasmania and its officers, and especially to the ungrudging help given to me by the Superintendent of Technical Education, who adds to excellent technical and practical attainments and experience a strong administrative sense.

NEW SOUTH WALES

Technical education in New South Wales is provided for both in full-time schools for pupils who have not yet commenced ordinary employment, and in part-time courses for those who are already at work. The first type of education is furnished by schools for boys which are termed junior technical schools, and schools for girls termed domestic schools. The principal organisation for part-time work consists of the Sydney Technical College—a very large institution with some 15,000 students. There are also five suburban colleges. In each large centre of population also there is a technical college, and usually a junior technical school. I had the privilege of visiting a selection of the 'provincial' colleges and schools at Goulburn, Newcastle, and Wollongong. These colleges draw a considerable number of students from their

hinterlands, as does the Sydney Technical College from the widely flung suburbs of the city.

Full-Time Education in Junior Technical or Domestic Schools

The junior technical schools are superimposed upon the primary system and draw their pupils from them at the same stage as do the high (or secondary) schools, that is, at about the age of twelve years. They offer a three-year course, but, as is the case elsewhere in Australia, only a minority of the pupils, varying from about 20 per cent. to 40 per cent. of the original entry, enter the third year, and this proportion diminishes rapidly as that year runs its course. It follows that the great majority of the pupils are under the compulsory school age of fourteen. Thus, substantially, the junior technical school in New South Wales forms no parallel with the English junior technical school, which has a normal commencing age of 13½ and offers either a two- or a three-year course, a course which the student is under an obligation to complete, and, in a majority of instances, does in fact complete. The number of junior technical schools and pupils in New South Wales, as in Victoria, is higher relatively to the population than it is in England. But, to the best of my observation, the schools are less effective; and this, under the age conditions, must inevitably ensue.

The junior technical school of New South Wales differs from the Victorian school of the same name in its location and in the facilities for practical work which it provides. In Victoria the junior technical school is always, or nearly always, in a technical college (in Melbourne itself in a branch or suburban technical college) specially built for the purpose, and equipped for relatively advanced evening students and for the day apprentice classes. Thus the Victorian junior

technical school has at its disposal a most ample equipment, more than equal to any demands likely to be made upon it by the youthful pupils of the junior technical school.

The New South Wales junior technical school is, as a rule, in a building constructed not primarily as a technical college or branch college, but as an ordinary day school, with practical rooms attached. The usual provision of this kind is a woodwork room or rooms, and a metalwork room, equipped with benches, vices and tools, and sometimes but not invariably with a lathe or lathes. It is therefore more nearly a parallel to the English senior school of the more recent type, or, except in its lower age range and therefore in its quality of work, selective central schools such as are to be found in large numbers in London and some other big English cities. The character of the practical work in New South Wales therefore is less elaborate than that met with in Victoria, though it does not follow that it is less suitable to the tender years of the pupils. On the whole, however, viewed as a pre-apprenticeship training, the New South Wales junior technical school is probably less effective than its Victorian prototype.

On the other hand, though I was unable to examine the work in any detail, I was left with less apprehension in New South Wales as to the quality of the 'humane' instruction than was the case in Victoria. The whole administration seemed rather less mechanical, and the quality of the teachers employed in teaching the humanities seemed to me to be less doubtful. Probably the teachers, from the point of view of their careers, are less disinclined to take up posts in the New South Wales junior technical school than is the case in Victoria.

The junior technical school type of instruction in New South Wales is losing some of its former unpopularity with

parents and teachers, and the junior technical school is no longer regarded as a dumping ground for mediocrity or something below that. But it seems still to be true that, as in England, and doubtless elsewhere, the best intellectual material from the primary school seeks or is diverted into other avenues of education. Interesting side-evidence on this point was furnished accidentally at a meeting of an education society in Sydney. A professor had been investigating two competing methods of testing children for mathematical ability, and both kinds of test had been given to children of the same age and standard in two or three types of high school and in a junior technical school. The results of both tests in every instance save one showed the ability of the junior technical school pupils to be lower than that of the children in the high schools, and this, in the elementary stages of a subject of great importance in technical schools. The better brains in Australia, as elsewhere, at least among pupils originally educated in state primary schools, are probably diverted very largely to the secondary system.

My opportunities for investigating in detail the efficiency of the junior technical school, here as in the rest of Australia, were insufficient to permit of well-authenticated judgements. I was never able to spend a long time in any school: and I was inevitably (and very hospitably and courteously) accompanied by others. The only way in which the work of a school can, even approximately, be evaluated is to visit the school frequently, unaccompanied, to make friends with the teachers and pupils, and to observe the work with care as well as friendliness for a considerable period. This I was unable to do in any Australian State, a position arising partly from lack of time and partly from the inexhaustible benevolence of the Australian officials and teachers.

There are several respects in which these junior technical schools fall short of a reasonable best:

(1) The schools are too large. No school of the type visited in New South Wales had fewer than seven hundred pupils and one or two reached the one thousand level. Where the junior technical school itself fell short of this in numbers the head was also in charge of a primary school, in one case at least (and perhaps in others not seen) reaching down to the infants. A junior technical school education cannot effectively be superintended by the head master, who tends to become little more than an administrator, rather than one who knows and to some extent guides individual pupils.

(2) The classes are too large. The normal number of pupils in a class is forty-eight. The class rooms (other than practical rooms) are designed for forty-eight and a few additional pupils are not uncommonly crowded in. This is in striking contrast to the maximum of thirty which is the English practice in junior technical schools.

(3) The responsibility of providing books, paper, and working materials (other than wood and metal) is thrown too much on the pupil. Materials are, therefore, scanty, and the poorer pupils are the less well provided.

The minister, officials, and teachers are well seised of the importance of this type of education for the right children at the right time; and it is a great advantage that this idea is now firmly recognised. A good deal of excellent work goes on, and the recognition of the educational value for many boys of this form of education is all to the good, but the education is given under conditions which make its reasonable success very difficult.

The domestic schools are in a similar case. There is a three-year course. Only a minority of the girls complete it. Most leave at the end of their second year, when they are

about fourteen. The schools are 'domestic' because during the first year all girls take cookery, dressmaking, laundry and housecraft. The school visited had admirable and ample accommodation for the teaching of these subjects. In the second year, however, the girls may elect to replace all of these subjects, except needlework, by the 'commercial' subjects of bookkeeping, shorthand and typewriting. And at least two thirds of the girls do so elect. Thus the schools are domestic only in a limited sense; and they are technical only in the meaning that a few girls in their second year take a relatively advanced course in domestic science, whilst in that same (second) year a majority prepare themselves for office life by taking office subjects.

In fact, therefore, the full-time technical, commercial, and domestic schools are, by reason of age of pupils, curriculum and facilities, best regarded as 'senior' elementary schools taking certain 'practical' subjects as a general education rather than as pre-vocational schools. They gave a post primary education with a practical bias. Subject to the limitations already pointed out, they do this efficiently. So far as I was able to observe, the work of the teachers, head teachers and others was efficient and whole hearted.

I suggest that the Department of Education in New South Wales should consider whether it is not advisable to organise a series of full-time junior technical, or in some cases vocational, schools for children aged from fourteen to sixteen. The number of such schools would necessarily, at least in the first instance, be small. It would be possible, therefore, to limit the entry to pupils prepared to stay the full course. Such schools would become the source of supply of really well educated and, in a preliminary way, technically trained entrants to those trades, which at the moment are eagerly seeking for the best type of craftsman or craftswoman. And

the pupils, who would lay a really solid foundation for their future part-time studies, on entry to industry would find their prospects limited only by their ability and their character. The schools for boys would perhaps be first directed towards the engineering industries, mechanical and electrical, and in the case of the girls towards high class dressmaking and ladies' tailoring, millinery and the like. Such schools with small classes of thirty and with specially selected teachers would undoubtedly be expensive. But a wise initial capital expenditure is often the necessary foundation of success. The schools might, indeed, form the senior section of organisations having an initial entry age of about twelve years.

Part-Time Education at Sydney Technical College and Suburban Colleges

Even more closely than Victoria and other Australian States, New South Wales follows the British tradition of part-time education for other than university students, sharing both the merits and the drawbacks of that tradition. Nevertheless, in this department there are some most interesting and laudable features.

In respect of numbers the Sydney Technical College, with its 15,000 students, is certainly the largest institution of its kind in Australia and there can be few larger anywhere. Its work is carried on in two buildings: (1) The Technical College proper, in which most of the science and trade work is concentrated, and (2) in the East Sydney Technical College, as it is called, which occupies the adapted buildings of the old gaol, an adaptation which is pleasing in more senses than one. Both places are under the control of the Principal of the College, who is assisted by the devoted and able Vice-Principal. In the East Sydney portion of the College the

domestic work and the large and important art school are concentrated.

As is the case in every Australian capital, with the possible exception of Adelaide, the premises of the Technical College leave a good deal to be desired. The East Sydney building, as we have seen, consists of adapted gaol premises. Though this is a pleasing and significant index of social progress, and though, in fact, the adaptation is skilful and the result certainly not inefficient, it remains true that a really worthy technical college building cannot be constructed out of a building solidly built and designed for other purposes. It will do, and it will serve probably for a long time. But it cannot be regarded as more than an efficient makeshift. The other building, the Sydney Technical College proper, was, as regards its older portions, built as a technical college when requirements differed a good deal from those of the present day. Much of the considerable space available is occupied by added buildings which, whilst internally suitable, and commonly very well equipped, and as units well designed, tend to destroy the amenities of the site, and present to the visitor a rather confusing and somewhat muddled mass of buildings. It is not true to say that the existing buildings are plainly inefficient or radically unsuited for their purpose. In fact they are better than some similar groups of buildings elsewhere, and far from the level of disgraceful inefficiency, which is the only adequate description, on the material side, of the buildings at Perth and Hobart. Nevertheless few citizens of Sydney or New South Wales could take any pride in their Technical College. I was asked (though not often) what I thought of the harbour and the bridge, but no unofficial citizen asked me what I thought of the Technical College, nor directed me to it with a proud gesture. A new building is necessary for any approach to complete efficiency;

and the indirect effects of a simple, dignified, and adequate technical college as a feature of a great city like Sydney would not be negligible, especially in a city taking a more than ordinary pride in its material environment.

The College provides for all varieties of part-time work demanded by the economic activities of the city and its hinterland.

The courses are of two kinds: (a) Diploma courses of the 'professional' type, in which the sciences relative to various occupations, particularly engineering, mechanical, electrical and civil, architecture and building, the chemical and metallurgical trades, and so forth, are taught. (b) Trade courses in which the practical side of the work is emphasised, and facilities are afforded for apprentices and others to extend their experience of workmanship in a manner difficult or impossible for most young men in modern factories where process or repetition work is prominent. Calculations and theory of the respective trades, and the relevant mechanical drawing, are also included in the trade courses.

The trade courses form a higher proportion of the activities of the institution than would be the case in a typical English college of the same rank. This, in a relatively new country, without the tradition of craftsmanship common to the industrial countries of Western Europe, is inevitable and proper. These trade courses in Sydney and elsewhere are indeed the source to which the State must look for an increase in the supply of skilled workers so necessary to the further development of secondary industries as, in Australia, manufacturing industry is universally termed.

The Central College is reinforced by five suburban technical colleges. A year ago full-time heads were appointed to these branch colleges, and the appointments have been amply justified. This is a considerable and commendable advance.

In the example visited, a school held in reasonably suitable buildings, with ample workshop space and equipment, the new principal had increased the attendance threefold in little more than a year. Similar results were obtained in the other suburban schools. The branch college I visited in detail was, on the material side, the best of its kind. I am told that several of the buildings of the suburban colleges are out of date and unsuitable.

These branch colleges provide trade courses for most of the larger industries, and furnish courses preparatory to the diploma course of the Central Technical College.

It is to be remarked that the Central College and the suburban colleges seen are well equipped on the practical side. In this respect New South Wales, like most of Australia, can stand comparison with any educational areas known to me in Great Britain or elsewhere.

It was very difficult for me in the circumstances of my visits and under the limits of time available to estimate the qualities of the staff. In the Central Technical College most of the heads of departments are men (or women) of high attainments and induced the belief that they are keen and competent organisers and teachers. Nor is there reason to doubt the general quality of the very large part-time staff, though the surface impression carried away was that they were somewhat below the general British level. The judgement is so difficult, however, that I may well be wrong: and real inefficiency was nowhere strikingly evident.

When we note that distributed between the two buildings of the Sydney Technical College there are some 15,000 students, it must be remembered that this includes the School of Art, the important day School of Domestic Science, and that it also includes a mass of elementary work, chiefly part-time evening work, which, in a city of the importance of Sydney,

is unsuitable for the Central Technical College. Sydney is considerably larger than Melbourne; roughly, its population is 25 per cent. greater, and it is nearly as industrialised. Whilst Melbourne has twelve branch technical colleges, Sydney has only five, and it is but recently that they have been given full-time principals. It is, I believe, the outcome of personal accident that technical education has in most respects gone ahead in Melbourne. Sydney is for the moment the land of promise rather than of performance. There is little doubt, however, that if conditions remain favourable, vigorous progress may be made in Sydney. Land for a new technical college has been 'resumed,' that is, acquired by the State, and new branch colleges are projected. When these are in being it will be possible to relieve the Central College of a good deal of elementary and preparatory part-time work, and to institute day technical work, such as is found (though none too extensively) in the major British technical colleges and at Melbourne.

On the side of curriculum I think that the evening diploma courses require reconsideration and, probably, revision. They are too severe for part-time evening students. They demand four evenings a week for classes alone, and too little time remains for study and 'homework' by the students. This is not merely my personal judgement, but the opinion of responsible people on the spot. There is too little time for intellectual digestion and too much to digest. At present, students (or some of them) pass examinations and get diplomas, but it is doubtful, indeed, whether all of them have the kind of knowledge which becomes a permanent possession.

It should be mentioned that training classes for part-time teachers are held at the College. This is an excellent idea, for many of such teachers are necessarily without teaching experience or training, and have to pick up the craftsmanship

of teaching as best they may. One class of this kind which I was able to attend dealt with English for the untrained teacher, and the effort to give some guidance in this important matter, among others, is a step in the right direction.

In the regulation of apprenticeship, and, therefore, in the provision of compulsory day-time instruction for apprentices, New South Wales, like Great Britain, is far behind the other Australian States and South Africa.[1] And, at the time of my visit, there seemed to be no immediate prospect of bringing New South Wales into line with Victoria, Queensland, and the smaller States. It is probable, however, that in time New South Wales, which ought, surely, to be the leader, will attack this problem. In this matter it is behind even the Mother Country. For in England, at least many of the larger employers (including the Government itself) give time off in the day to the younger employees. This voluntary movement is, of course, confined to the enlightened few, but inside or outside works it exists in a not inconsiderable though too small a degree. To the best of my knowledge no such voluntary movement exists in New South Wales outside the railway service. In conditions which, after all, are much simpler than in our old and complicated economic organisation, it would seem right for New South Wales to do what has already been successfully done in other Australian States where initial difficulties were at least as great as they are likely to be in New South Wales.

Technical Education Outside the Metropolis

Technical education in New South Wales is by no means confined to Sydney. Some of the things which, owing to the generous help of the Department and its officials, and espe-

[1] A small beginning was made in 1937, but substantially there is no compulsory day-time instruction for apprentices in New South Wales at the date of writing.

cially of the Deputy Director, who among other things is in administrative charge of technical education, I saw in extra-metropolitan places were of outstanding interest. The larger provincial towns, like Newcastle and Wollongong, are provided with technical colleges in which, and especially at Newcastle, the largest industrial centre in New South Wales outside Sydney, a good deal of advanced work is done; and a typical smaller centre, Goulburn, was visited, not to mention the Federal capital Canberra, where education is administered for the Federal Government by the Education Department of New South Wales.

In such centres as Newcastle and Wollongong an incipient movement towards decentralisation of educational control is visible. In each of these centres an advisory committee for the technical college has been set up. In both instances, but especially, perhaps, at Newcastle (which is the largest city outside Sydney), this body has real functions. It makes representations as to the organisation of courses, staffing and other internal matters, and it has had considerable influence in the framing of plans for the new college (badly needed), of which one section is now built. The personal constitution of the advisory committees is excellent, and in each case some of the most important men in industry serve with real interest upon the committee. But the functions of these committees are advisory only. In both cases their influence seemed to be noteworthy. There seems little doubt, however, that they are well suited to some degree of responsible administrative power.

It is under consideration whether the appointment of the part-time staff should not be delegated to these advisory committees. My impression was that this was an entirely safe, indeed an overdue, project. Subject to some definition of qualification and to departmental approval the appoint-

ment of the assistant full-time staff could, I think, wisely be deputed to these advisory committees. And though the appointment of the principal might remain with the Department, the advisory committee should be brought into consultation in this matter also. These larger provincial colleges seemed to me to form a suitable and suitably limited field for an experiment in educational devolution. For some kind of devolution is inevitable if the population of New South Wales increases very much beyond its present limits.

At Newcastle the Technical College, though at present conducted in poor and unsuitable buildings, is a vigorous institution. There is a junior technical day school of the same kind as the Sydney school already described. It has about 1,000 pupils, and a somewhat higher proportion than elsewhere (though still a relatively small proportion of those who enter) is to be found in the third year. The metalwork room seemed to be very inadequate.

The evening part-time work is of the usual order: commercial, engineering, building and other technical classes, together with cookery, dressmaking and the like, and is spread over two buildings (one a converted brewery) which should be replaced. There was some good advanced diploma work in process, but the preparatory work was, I think, poor. The converted brewery, with its adjacent added building, is not an unworkmanlike building, and is more convenient than the original technical school some distance away on the main street. But it is overcrowded. It is only fair again to record that a new technical college is planned; one section is erected and, at the time of my visit, was almost ready for opening. If the whole college is completed with the same efficiency, Newcastle and New South Wales will have a technical college which will bear comparison with the best anywhere. A vigorous head and a competent staff will then be able to do

justice to students who struck me as eager and of at least average competence.

It was a pleasure to meet the governing body and to see a group of busy men of high standing in industry devoting themselves to the development of a branch of education which they are well qualified to understand.

It is an unenviable necessity which prevents my writing at length about the visit to Wollongong, where the vigorous Technical College, day and evening, with excellent workshops and equipment, is ably conducted under the supervision of an enlightened and capable head. Here too there is an advisory committee of precisely the right composition. The only valid complaint I can make against Wollongong—the municipality as well as the College—is that its hospitality takes too many forms, begins too early and lasts too long for the working investigator. This is characteristic of Australia and New Zealand.

In New South Wales, too, the smaller towns have not been neglected. I was able to see the technical school at Goulburn, one of the smaller centres. There is no full-time junior technical school, but the evening work, on a smaller scale but of the same type at the colleges already described, is vigorous. There are courses for engineering, mechanical and electric, classes on Diesel engines, which are now an important feature of many of the sheep stations and farms, motor repairing, and building. There are good workshops. And the work is carried out in adequate buildings, which are clean and even tastefully decorated, a point on which too little stress is placed in Australian technical colleges inside and outside of New South Wales.

In the day-time the equipment is available for the unemployed who work under guidance, and for such apprentices as are available. The guidance given was very competent. A

feature of the work which requires notice at Goulburn is the excellent instruction given in wool-classing, and the facilities given by a large sheep station close by for observation of practice, and for such exercises as sheep judging by the students. I spent a most profitable afternoon at the neighbouring Bullamalito station observing this.

In New South Wales not only are the interests of the smaller towns and their hinterlands kept in mind, but a most interesting beginning has been made in bringing the possibility of practical work and instruction to these thousands of scattered students who, in what I suppose I must call the back blocks, can and do work perseveringly and often in solitude, through correspondence courses. The Department has caused two large railway coaches to be fitted up, one as a lecture and drawing room and one as an engineering workshop and laboratory. A peripatetic teacher accompanies the train, which is drawn up on sidings at convenient centres for periods of about a fortnight at a time. Here the rural student, whose work on the farms and stations becomes daily more concerned with the operation of machinery, obtains theoretical instruction as well as practice in the use of simple machinery. The equipment has been chosen with sagacity and so has the teacher who lives in the train. I saw quite a number of eager students drawing, experimenting, acquiring some knowledge of the principles upon which the farm machinery is built and so being enabled both better to diagnose troubles, and to enlarge a trade knowledge likely to be useful to them wherever their future may lie. One student recruits another and the movement grows. My visit was unannounced, but I found the mobile workshop the centre of eager interest, and I was both amused and refreshed to hear a rough old farmer (who turned out, however, to be cultivating 2,300 acres of wheat alone, not to mention responsibility for a sheep station where

his animals were reckoned by the thousand) holding forth on the value of a knowledge of *principles*, and the relative uselessness of empirical tinkering.

The provision of such mobile workshops is an idea most creditable to its originators and deserves imitation in predominantly rural communities where distances are great. It must be remembered that in many Australian areas the distance to a competent repair shop may be reckoned not in tens of miles but in much greater units. Even in England, where probably very few farms are more than ten miles from a repair shop, but more urgently in Wales and Scotland, the idea of a mobile workshop might profitably be considered. Besides its direct usefulness, such an organisation has a recruiting value, and is an excellent means of popularising technical education.

Finally, mention must be made of the Agricultural High School at Yanco. This is a high school of some 200 boys, all resident and chiefly the sons of farmers. The boys get the usual high school curriculum, except for foreign languages, and spend an average of about one day a week on the large school farm, which, besides an adequate area for tillage, runs sheep, cattle, pigs and horses. There are excellent workshops for metal and for woodwork, not omitting the important matter of forges. I formed a most pleasing impression of this school, the only one of its type I was able to visit. The cattle and the pigs were first rate, and their quality and care were guaranteed by the whole-hearted and red-headed Scot from Perth who was in charge of this part of the work.

Conclusion

New South Wales remains, in the matter of technical education, a land of considerable achievement, but of even more considerable promise. The authorities are well aware of this,

and plans for development exist. The present Minister and his officers have designed many improvements and are exploring the possibility of others.

The paucity of day instruction for apprentices and others requires remedy. The present range and character of pre-apprenticeship courses for boys and girls require careful consideration. The provision of a worthy technical college in Sydney, and the reorganisation of the evening work so as to relieve the Central Technical College of much elementary activity and give scope for its appropriate advanced work, is very desirable. But there is no lack of will to take the necessary action and to investigate precisely what that action should be. If there is much to admire and much to criticise in the present, there is, I think, great hope for the future.

QUEENSLAND

Queensland is a State some seven times as large in area as Great Britain, with a population of a million, of whom about a third live in or about Brisbane. Education is administered, as elsewhere in Australia, by the State Government, and there are no local authorities.

There is a large technical college in Brisbane itself, and there is a technical college in each of the important centres of population. Of these I was able to see only one, at Ipswich, a centre for the manufacture of railway rolling stock. The number of considerable towns, such as Rockhampton, is greater in proportion to that in the other States, and according to the best of my information they are adequately provided for.

There are here no junior technical schools of the type to be found in Victoria. But there are both commercial and technical high schools which may be regarded as providing pre-

vocational or pre-apprenticeship training. In Brisbane, and in one or two other large centres, these are independent schools. In smaller places, of which I was privileged to visit one, at Nambour, some sixty-five miles north of Brisbane, there is what is called a 'rural school.' This provides education from the infant stage up to the high school, and, in the instance seen there was excellent provision for practical work.

The importance of technical education is, thus, well recognised in Queensland, and the Superintendent of Technical Education ably organises the work under the general control of the Director of Education for the State.

Instruction of Apprentices

A pleasing feature of the scheme for technical instruction is to be found in the educational provision for apprentices. In this work Queensland appears to have been first in the field among the Australian States, its apprentice scheme dating back to 1924. Here, as in Victoria, control of apprenticeship, with a compulsory provision for their technical education, is now applied to practically every skilled trade. There are joint advisory committees of employers and workmen, under the leadership of the appropriate official chairman. The proportion of apprentices to journeymen is regulated and, in some trades, e. g., the electrical trades, the proportion of apprentices is unusually (but legitimately) high; and this seems to be generally true in the expanding industries. All apprentices are properly indentured. Compulsory attendance in the day time is the rule in all except the smallest trades where day time classes, owing to small numbers, are impracticable.

Fees of the apprentices, who comprise 80 per cent. or more of the possible attendances, are paid by the employers. Very

careful records are kept, and attendance and progress are reported to the apprentice commission and to the employers. The schemes seem to be watertight, and are well and intelligently administered. Any preliminary friction has passed away; and the schemes are accepted by employers and apprentices as a normal part of the training process. Provision is made for apprenticing, as late as the age of eighteen and sometimes later, lads of good education, or those who, leaving school early, have passed into other occupations. In a few cases the normal length of apprenticeship, which is five years, may be reduced in the interest of these older apprentices. I saw a number of these apprentice classes, in the engineering, building, printing, and plumbing trades. The zeal and involuntary and cheerful interest of the apprentices were both certain and remarkable and there was no evidence, to the unexpected visitor, of friction or waste of time. The schemes of work, which give about half time to theory and half to practice, are well designed.

Through the agency of this scheme Queensland is doing at least its share in providing for the production of well-trained craftsmen so necessary for the further development of 'secondary' industries.

Brisbane Technical College

The Brisbane Technical College is well situated, within easy walking distance of the centre of the city, and adjacent to the beautiful Botanic Gardens. Most of the buildings were originally designed for the University. Indeed, the engineering laboratory is used in common by the University and the Technical College. New University buildings are to be provided, and, when this is accomplished, the Technical College will have further, and probably adequate, space at its disposal. Unlike most of the other Australian cities, there-

fore, Brisbane has a Technical College reasonably well suited to its purpose. No rebuilding seems to be required.

As usual, the great bulk of the work is evening work, with the exception of the numerous day classes for apprentices. Nearly every variety of technical course is offered—engineering, mechanical and electrical, chemistry, the building trades, wool-classing, sugar chemistry (a good deal of which is done in the day by fairly advanced students who attend during the long season, or rather out-season, when the sugar mills are not working), printing and decorating.

The courses are of the two kinds usual in Australia: diploma courses of the professional kind, which are parallel to the 'major' courses in British technical colleges, and the trade courses, in which half time is given to workshop activities and half to theory and calculations, and drawing of a simpler kind than that provided for in the diploma courses. Here, as elsewhere, the proportion of diploma students to trade students is smaller than it would be in Great Britain. And here, as in New South Wales and elsewhere in Australia, the diploma courses seemed to me to be somewhat too ambitious and overloaded at the top. The last years of the diploma course require four evenings, sometimes of three hours, in attendance at the College. This is asking far too much, though I am told that the students are keen. Not only is the strain on students who have already done a day's work too much, but it leaves them little time for reading and other forms of private study, for self effort, in fact, without which the process of education is radically deficient. No student can effectively be educated by being lectured to or 'taught.' If he is to be really well trained, and if the knowledge gained is to be really his, he must work by himself and for himself.

As elsewhere, I saw the teaching with too little thorough-

ness to be able to pronounce any confident judgement. But in some of the diploma classes the standard was undoubtedly high, and there is no reason to suppose that the teaching in general is otherwise than competent.

The commercial department is under the separate jurisdiction of the head of the Commercial High School.

There is an art department for which the accommodation is none too good. There is day and evening work. I saw nothing in it novel or striking. On the whole, it seemed the most jejune and least interesting department of the Technical College.

Mention should also be made of the excellent organisation at the Technical College for the instruction by correspondence of technical students too remote to attend classes in Brisbane or the other Queensland towns. In this tuition the apprentices existing in small numbers in these remote places take part at the same fee (10/–, returnable by employers) as those able to attend the technical colleges. I was able to go over some examples of the papers set and the work done. No one could have anything but praise for the care and efficiency with which this scheme is carried out.

Full-Time Day Education

The day provision in Brisbane for technical education, other than the training of apprentices, consists of a Commercial High School and a Technical High School.

The Commercial High School, which was formerly a part of the Technical College, but is now a separate organisation under its own able headmaster, is held in two blocks of the group of buildings which form the Technical College. There are two sections, for girls and boys respectively, each held in a separate block, and the same head controls both. There are altogether about 1,400 students, of whom 600 are boys and

800 girls. This is an unusual proportion of boys for an organisation of this kind, and it may be due to the fact that many Brisbane employers prefer boys to girls even for typing and shorthand. The State Commercial Employment Bureau is within the school curtilage and seems to be most efficiently organised.

The minimum standard of entry is Grade VII of the primary schools, but boys and girls enter from all types of schools, and the normal age of entry is 13 years. The curriculum is liberal; about 40 per cent. of the school time (some twenty-five hours a week) is given to bookkeeping, shorthand, typing and business method, and the rest to the usual subjects of the high school curriculum, including French and some science. Pupils prepare for the University Junior Commercial Certificate, an examination suited to students of about fifteen years of age or over. The course therefore is a two-year course, and it is completed by a large majority of the students. Thus the usual leaving age is from 15+ to 16, a fact which I verified for myself. About 80 per cent. of the students are 'scholarship' students, that is to say, they are admitted on the results of examination and pay no fees. The classes are on the large side, but not as a rule over forty, and, for Australia, this is virtuously small.

The whole institution appeared to me to be well organised, not mechanically inhuman, and well adapted to its purpose.

Mutatis mutandis what is said above of the Commercial High School applies to the Technical High School, which is on a portion of the same site. The terms of admission are the same. There are about 400 students. There are rooms for woodwork and metalwork, there are a few lathes, but no machine shop, and there is a good smithy. The standard of work, practical and theoretical, is good, though the equipment is more suitable for the practical side of a good general

education than for an effective pre-apprenticeship training. But there can be little doubt that the pupils who, again, as a rule stay for the complete two years of the course, have great advantages in the theoretical training for the constructional trades, and a good deal of experience in handling tools and materials.

The full-time day schools are completed by a good domestic school, which includes in its curriculum dressmaking, cookery, laundry and housewifery training, with some rather careful attention to science. The tone of the school is excellent. From this school there proceeds a supply of domestic teachers for the primary schools, as well as young women fit to take posts in institutional cookery and management.

Instruction in Provincial Centres

Of this, time permitted me to see only two examples. At Ipswich, an important manufacturing centre with a population of about 30,000, the site of the State railway works, there is a fully equipped technical college, presenting all the usual features of such a place.

Most of the advanced technical work, which includes diploma courses as already described, is done in the evening, and all the local trades are provided for. There are a day commercial department of the usual type, attended chiefly by girls, an industrial high school, and an excellent domestic department. There are also good woodwork and metalwork shops, and smithy for the high school, and the equipment for the evening work is adequate. Altogether it may be said that the provision made for technical work (in the wider meaning of the term) in this provincial centre is creditable to all concerned.

The rural school at Nambour has already in outline been described. Except that the workshop has only just acquired

one lathe (an insufficient number), no further description seems to be called for. The provision of infant, primary, high school and technical work in one composite organisation seems to me to be a satisfactory attempt to solve the rural problem. Some lads from farms come for workshop instruction (and from a radius of over twenty miles) one day a week. Nor are unemployed lads or those not yet entered into employment excluded. Except that, as usual in Australia, some class rooms are badly overcrowded, and some classes are distinctly too large, one leaves Nambour with a hopeful outlook and with much respect for the work attempted and done.

Conclusion

The general conclusion I formed, therefore, is that in Queensland technical education is well provided for, and this is true of the provincial cities as well as of Brisbane itself. It is ably organised by a most competent officer working under the State Director of Education. Though the administration of the system is centralised, a good deal of local liberty has not been found inconsistent with central control and guidance. I left Queensland with a pleasing impression both of its educational organisation on the side which was my principal concern, and of its people and the land they inhabit.

III

NEW ZEALAND

III

NEW ZEALAND

I SPENT about two months in New Zealand, visited all the principal centres, and a considerable and, I am told, representative section of the smaller urban centres. Free access was given to all the institutions visited, and every facility was most courteously furnished to me by the Department of Education and by the heads and the staffs of the schools and colleges. I wish to put on record my most grateful thanks for the warm and friendly welcome everywhere received. I wish further to record the great advantage to myself furnished by the opportunities I had of conversations, frank I think on both sides, with departmental officials, including the Director of Education and the principal inspectors, and with the principals, heads of departments, and the staffs of the colleges and schools visited. No one could have been treated more generously or more kindly. And the survey would have been impossible without the constant help of Dr. Beeby, Director of the New Zealand Council for Educational Research, his assistant, Mr. McQueen, and the staff of that organisation. For this I wish to offer the heartiest acknowledgments and thanks.

THE GENERAL PROBLEM

The impression made upon me by the arrangements for technical education in New Zealand is almost entirely favourable. Some apparent untidiness of organisation, which is bound initially to strike the visitor, resolves itself, on experi-

ence, into the consequence of efforts to meet the needs of very varied conditions by intelligent empiricism rather than by forcing a logical and symmetrical organisation upon an asymmetrical social growth. This method, not unfamiliar to an Englishman, has resulted in the provision of facilities suited to the facts of varying local conditions. The apparent untidiness is only on the surface. And, were I responsible, I should hesitate to sacrifice what seem strong practical advantages, to any scheme, however logical, based upon *a priori* considerations. In the result, it seems to me, adequate provision for the important aspect of education, which is our present concern, has resulted at least in all the larger and most of the smaller urban centres. Nor have the needs of the scattered agricultural communities, which are, of course, the basis of New Zealand's economic life, been neglected. Leaving aside the two agricultural colleges of university rank, which are outside the scope of this report, I know of no region where more attention, proportionately to the needs, has been given to the rural community than in New Zealand. Indeed, the weaknesses of the system, to which the honest critic must draw attention, arise, I think, chiefly out of the difficulties presented by a relatively small and scattered community, necessarily basing its life on agricultural industry, in a land topographically forbidding the concentration of its urban population in a single centre.

Australia and New Zealand present a contrast. In each Australian State about half the population of the State lives in a single large city. In New Zealand, out of a population of about 1½ millions, only some 600,000, about 40 per cent., are gathered into and divided between the four principal centres. The largest of these, Auckland, has a population of more than 200,000. The smallest, Dunedin, does not exceed 90,000 in population. These, of course, are considerable cities for

any country. But the absence of anything like the Australian aggregation of population, arising as it does from the geographical structure of New Zealand, has prevented any concentration of manufacturing or other industrial activity, and carries with it the corollary that in each of the four principal cities a large number of miscellaneous industries are carried on, each on a relatively small scale. No city has a preponderant and typical industry. A private works employing fifty workpeople is exceptionally large. Moreover, commerce and its related professions are similarly distributed, unequally, of course, between the four major centres. Thus the problem of technical instruction in New Zealand is much more difficult than it is in old and crowded lands, and harder than in those relatively young states where urban life is very largely concentrated in a single city. The characteristic industrial firm in New Zealand is one employing from a dozen to twenty workpeople. The largest industrial employer is the State, which maintains, for instance, considerable manufacture of rolling stock, for the State railways, and the post office. Electrical engineering is largely in the hands of the State or the municipalities. Indeed, beyond a certain amount of ship repairing done at ports like Auckland and Wellington, and some motor-car assembling, engineering, outside civil engineering, which is largely a State concern, is generally motor-car maintenance and general repair work. The building and the printing industries, of course, exist in all parts of the country, especially in the four great centres. And as a good deal of machinery is used on the farms, workshop practice in metalwork and woodwork is important for agricultural industry.

It is in circumstances roughly described above that technical education has to be carried on. It has to meet very miscellaneous needs; the variety of industries carried on in

the larger urban centres is large, the numbers employed in each category of industry is small. In my judgement this difficult problem has been courageously and ably met, and much of the credit for this is due to able, clear-sighted and devoted men like Mr. Howell, to whom the system largely owes its origin, and to Mr. Latrobe, who has recently retired from the Education Department after many years spent in facing successfully the difficult problem of technical education in New Zealand.

Though it may not always have been so, at the present time the technical side of education is willingly forwarded by the Education Department, and there can be few well-founded complaints of the zeal and financial generosity with which it is now carried on. I met no case of a starved institution. Equipment is almost always adequate, and often excellent.

FULL-TIME TECHNICAL INSTRUCTION

The institutions devoted to technical education preparatory to industry take several forms. In each of the four principal centres (Auckland, Wellington, Christchurch and Dunedin) there is a large technical high school. Elsewhere there is either a technical high school or what is called a 'combined school,' usually the product of fusion between a technical high school and an ordinary (academic) high school. Good examples of the combined school are to be found, for instance, at New Plymouth and Napier, though they also exist in other centres. In one instance a technical high school is conducted under primary school regulations, that is to say, a primary school has a technical top for boys and girls, but is under a single control. In other cases a district high school of a technical type is imposed on a primary school, but the two (though

under a single control) are recognised severally as primary and post-primary departments. In a fair number of rural districts where there is no technical high school, nor any other form of full-time technical education, evening classes are provided.

In the four principal centres the technical high schools are large institutions and each constitutes the day department of the technical college. The largest, at Auckland, has over 1,500 full-time day pupils and nearly 3,000 evening students. The smallest, at Dunedin, has some 900 full-time day pupils and over 2,000 evening students. Officially, the title 'technical high school' refers to the day school only; but, in fact, in all the larger and most of the smaller centres the technical high school is a part of the technical college designed for day and evening work. The day work carried on in the technical high school section of the institution is exclusively a full-time preparatory technical education. The part-time work, in contrast to Australian conditions, is evening work exclusively. There is no part-time day attendance of apprentices, and the education of those actually at work, including, therefore, all advanced work, is evening work.

The technical colleges in the urban centres, other than the four principal cities, are similarly organised. They are properly to be regarded as full-time day schools (technical high schools) with evening departments.

It is a significant fact that in the earlier days of my stay in New Zealand any mention of technical education to officials, principals, teachers and those outside the official hierarchy whose main interest was education, at once brought up the conception of full-time day education and mention of the technical high school. There was a tacit assumption that the main business of the technical college was the day school work. This was true, in some cases, of college principals, but

when specifically mentioned the assumption was denied. Now the approximate age of entry to the technical high school is 13 years; and the qualification demanded is that the pupil shall have reached Standard VI, or, as it is now called, Form II, in a primary or intermediate school, which occurs normally at that age. For most pupils the duration of the day course in the technical high school is about two years, for, though the high school usually offers a three-year and, in some instances, a four-year course, it is exceptional for more than 30 per cent. of the original entry to enter, still less to complete, the third year. Thus for the skilled trades the day education provided is not so much a technical education as a preparation for apprenticeship, and real technical education in present circumstances, if it occurs at all, must follow apprenticeship or other active participation in industrial life.

This is all the more true because, on the trade side, the practical training given in the technical high school is general rather than specific. It includes woodwork, which in most cases is given a pleasing practical trend, and metalwork, which always includes fitting at the bench, turning, some forge work and, occasionally, a little pattern-making or moulding. This, together with trade drawing, which in the later stages is often well taught machine drawing, and elementary mathematics, and certain 'humane' elements, makes an excellent preliminary training for a group of trades, but does not constitute specific training for any one of them.

Thus anything in the nature of specific and advanced technical education is and can be provided only in the part-time department, that is to say, under New Zealand conditions, in the evening classes. On discussion, this cardinal factor is always recognised by the principals. And to a varying extent it is recognised in practice as well as principle. But a man, however able and zealous, who is in charge of a very large

day school which, measured in the number of individual students, may be larger in some instances than any English secondary school, cannot, without efficient assistance, devote his energies to the effective organisation of a large mass of evening work. The total work of the two departments is too great for any one man to control in detail. It can be accomplished only if there are recognised and responsible departmental heads, and if some of these are in a position not merely to register evening students and give general supervision to their instruction, but effectively to organise the evening work, put the necessary life and vigour into that organisation, keep in touch with employers and workers, and zealously to do the hundred things which the maintenance of a live evening institution doing advanced work requires. In one instance I found much evidence that a principal, through effective delegation of responsibility, and a happy choice of departmental heads suitable for such delegation, had achieved this end satisfactorily. Both in large institutions and in the smaller ones the principal of the technical college tends, perhaps almost unconsciously, and certainly very naturally, to become a day school headmaster. It is a tendency and not, in most cases, a fully accomplished fact, for all the principals of the larger institutions fight against it, as do some of the principals of the smaller ones. As a tendency it is inevitable and should be recognised in action by the authorities concerned. Whilst the general responsibility of the principal for all departments of the college work should be maintained, some person or persons should be on the staff, at least of the larger institutions, whose special responsibility it should be to organise, foster, and supervise the evening work. And such head of the evening department or other appointed person should have sufficient time in the day to familiarise himself with local industry, interest employers

and employed, recruit pupils where desirable, and generally to infuse energy into that side of the work in which technical education of the specific kind is alone carried on.

The lack or partial lack of this organisation constitutes the major adverse criticism that I have to make on the technical high schools, or rather on the technical colleges. Naturally, I visited all the four principal technical colleges, which are situated in Auckland (population about 220,000), Wellington (160,000), Christchurch (135,000), Dunedin (90,000), as well as a representative section of the smaller colleges, including those in Ashburton, Napier, Masterton, Palmerston North, Wanganui, Feilding, Stratford, Hawera, and Hamilton.

In no single case is there a really defective building. The four principal colleges all have buildings which are well designed and suitable, and the last built of these, at Wellington, is in most respects an admirable building. They are all, very properly, in a central situation in the respective cities. There is little playing space in the immediate neighbourhood of the colleges, but all have ready access to good and extensive playing space for the day pupils. As a rule, they are well lighted by day and evening, though at Dunedin the lighting of a machine drawing room, an important matter, is defective. This is to receive early attention.

The equipment of the larger colleges varies in its details, but, broadly speaking, it is excellent for the work to be done. I observed for myself very few deficiencies in this respect, and heard very few complaints, and these only of a minor character. Evidently the Department of Education, whilst avoiding extravagance, has taken a generous view of the needs of the colleges, and it is to be congratulated on having a series of technical colleges which, taken as a whole, are, on the material side, as satisfactory for their purpose as any I have seen at home or in other Dominions.

The equipment of the smaller technical colleges and high schools is, again, very efficient. The new college at Masterton in respect of building and equipment is at least as good as any comparable college of which I know. It would rank high among the latest and the best of similar schools in Great Britain or in Australia. In fact, my general impression is that the New Zealand technical school buildings in the smaller places (say, of between 15,000 and 25,000 population), taken as a whole, compare very favourably indeed in every material feature with institutions of a similar size in England. I concluded my visits with a feeling of admiration for what has been done in New Zealand in this respect. Some of the newer institutions too, and perhaps especially the smaller ones, are tastefully decorated, and have on their walls and even in their art rooms some excellent pictures. Schools of art and art rooms are notoriously ill-decorated and unkempt.

In more than one of the larger colleges, however, some of the corridors have been allowed to degenerate into the unsightly and dirt-encrusted state to which the unpainted and hideously grey concrete staircases and walls, characteristic of Australian and New Zealand institutions of this type, so easily lend themselves; and, to mention small matters, in the largest school of all, at Auckland, the treads of the staircases are in a state of deplorable decay. To keep the larger and older technical college buildings as sightly as the pleasant new ones would cost little and be worth much. For the reason that they *are* technical colleges the spiritual value of simple and pleasing decoration is important, and this is, perhaps, especially true in a new country which has left behind it, only within living memory, the pioneer stage at which livelihood must precede aesthetic values.

To pass from the material environment to the personal, it is quite evident that the heads of the four principal colleges

are all men of as high a level of ability and, in most cases, of intellectual distinction, as are to be found in charge of comparable institutions elsewhere. New Zealand is distinctly fortunate in this respect. To me it was both pleasant and intellectually profitable to meet them.

The same is true of the principals of the smaller institutions, where, in truth, one or two men of quite remarkable force of character stand out, though (as there must be spots on the sun) the case of disillusioned attendance upon impending retirement is not unknown.

It would be wrong to leave unrecorded that the zeal and ability of the teaching staffs as a whole produced an excellent impression upon a sceptical if friendly visitor. In more than one major case the average level of teaching ability in a college, so far as it could be judged by necessarily abbreviated visits, was distinctly high. And though doubtless there must be some cases of relative incapacity or lack of energy, few such cases stood out before the casual visitor. Broadly speaking, and remembering that I was a visitor, not an inspector of detail, I am confident that the standard of knowledge and ability in the teaching staff is distinctly good. Indeed, the staffs of the technical colleges are capable of dealing effectively with a higher proportion of advanced work than in fact exists.

The Curriculum

As already explained, the technical high school is really a kind of pre-apprenticeship school. No trade is taught, but the schools have a non-specific vocational purpose. On the office side they come very nearly to the definite training of expert shorthand-typists. On every other side, including the agricultural, they give some useful preliminary training, but it is not, nor does it purport to be, more than a preliminary training of a general character. There is no British parallel

to them. They are less directly vocational than the English junior technical school, and much less so than the London trade school. In some respects their general purpose resembles that of the selective central school as known in London, Manchester, and elsewhere. But their age of admission is, normally, 13 years not 11; they are not selective; and they offer a greater variety of course, each as a rule having a larger vocational tincture than is implied by the word 'bias' as used by the British central schools.

The larger technical high schools provided full-time courses for (a) the constructive trades, engineering and building being as a rule separately organised; (b) commerce; (c) domestic occupations, including as a rule cookery and needlework; (d) art, and (e) a general course of a non-technical order, definitely aimed at the university entrance examination.

Obviously, the only non-technical element in the course is provided in what I have called (e) the general course. It is taken in all cases only by a small minority of the pupils, never, in my experience, exceeding ten per cent. of them. The justification put forward for its existence in a technical high school is that the opportunity of matriculating ought not completely to be denied to pupils entering these schools at the age of 13, some of whom may wish to proceed to a university, or decide upon occupation for which a university course is desirable. It should be remembered that large numbers of the university students at each of the university colleges are part-time students, a condition likely to be maintained, under New Zealand conditions, for any period to which the older among us can look forward. In some cases it is possible for commercial students to combine subjects (e. g., French) with their course to meet the requirements of the university entrance examination. In other cases a trade

student is provided with special facilities for learning a foreign modern language (always French) and can then matriculate. Personally, I am not disposed to criticise this arrangement adversely, any more than it seems necessary to object to the reciprocal condition in the ordinary academic high school where the tendency to introduce practical subjects like metalwork and woodwork or, in the girls' high schools, shorthand and typing, has increased and is increasing. It is not true that there is much approximation between the two types of school in aim and in content or curriculum. The technical high school remains, as to more than nine-tenths of its work, definitely technical, and it is equipped and staffed for that purpose. *Mutatis mutandis* the same is true of the academic high school. Practical subjects are taught there as proper elements in a general education, and the equipment is directed to that end.

In the technical school, and this is at least as important as the foregoing consideration, the staff are appointed for the purpose of technical instruction, and their outlook is, properly, technical. This is not the case (with the possible exception of a workshop instructor) in the ordinary high school. Nor should it be. The truth is that the purpose and the atmosphere of the two types of school differ fundamentally, and there seems little likelihood that these differences will disappear. I see no element of danger in the fact that some technical students (a very small fraction) are enabled to pass a matriculation examination from the technical school, nor in the fact that practical work is included in the academic programme. The situation is an inevitable outcome of influences by no means peculiar to New Zealand.

The courses in the technical high schools outlined above differ, of course, in their detail from school to school. The differences are not considerable, for the principals, who have

a free hand in the matter of curriculum, have the same set of facts as the bases of their organisation, and they arrive, for each type of course, at approximately the same conclusion. This is but another proof that liberty, reasonably used by well-qualified and reasonable people, leads more in the direction of uniformity than of marked diversity. If liberty is ill-used, the remedy is not to diminish reasonable liberty but to discharge inefficient or incompetent people.

It is impossible, as well as undesirable, in this report to reproduce much in the way of time analyses. The table on page 106 is typical, but no school reproduces completely the time analysis of any other.

Before turning from the full-time day courses to the important part-time (evening) work, some remarks upon special aspects of the day work may be useful.

1. *The Trade Courses.*—This term is used to cover what are practically full-time courses preparatory to entry to the engineering and building trades. In most of the larger schools the requirements of the two main constructional trades are separately provided for. In the smaller schools a single course necessarily provides for both, though even in some of these cases it has proved possible to give the metal workers more time in the metal workshops and less time than the 'builders' in the woodwork or other appropriate shops. In all cases, however, rather more time is given to practical work and rather less to mathematics, science, and drawing than would be the case in the typical English junior technical school. This arises partly from the real but often partly subconscious view that the purpose of the school is the training of craftsmen, whilst the British view, still persisting (but again often subconsciously held), is that practical training is, and should be, done in the workshop, and, therefore, even in the junior technical school, it is desirable to place a little

HOURS PER WEEK OF INSTRUCTION IN THE SUBJECTS OF DIFFERENT COURSES FOR 1938

1. Trades Course

Subjects	*First Year*	*Second Year*	*Third Year*
English	4.	3.	3.
History and Civics	2.	2.5	1.25
Practical Mathematics	2.75	3.5	2.5
General Experimental Science	4.	2.75	2.75
Trade Drawing	2.75	2.75	1.75
Woodwork	1.75	2.75	2.75
Metalwork	2.75	2.75	2.75
Sheet Metalwork	2.75	..	..
Office Routine	1.5	..	..
Physical Drill	1.	1.	1.
Sports and Games	1.	1.	1.
Electricity	1.25	1.5	1.75
Chemistry	..	1.25	..
Bookkeeping	..	1.5	1.5
Electrical Workshop	..	1.25	2.75
Motor Theory	..	..	1.
Motor Practice	..	..	1.75
	27.5	27.5	27.5

2. Commercial Course

Subjects	*First Year*	*Second Year*	*Third Year*
English	4.	4.	3.25
History and Civics	1.5	1.5	
Arithmetic	3.	3.	2.75
Home Science and Cooking	2.75	2.25	..
Drawing	2.75	2.25	..
Dressmaking	2.75	..	2.75
Bookkeeping	2.	2.5	2.
Shorthand	3.5	5.5	5.75
Typewriting	3.25	4.5	7.75
Physical Drill	.5	.5	.5
Sports and Games	1.	1.	1.
Singing	.5	.5	.5
General Knowledge	..	..	1.25
	27.5	27.5	27.5

3. Domestic Course

Subjects	*First Year*	*Second Year*	*Third Year*
English	3.	3.5	3.5
History and Civics	1.25	1.5	
Arithmetic	2.75	3.	.5
Home Science and Cooking	2.5	2.75	2.75
Hygiene (First Aid)	1.25	1.25	1.25
Drawing	2.25	2.25	..
Dressmaking	8.	4.5	9.25
Physical Drill	.5	.5	.5
Sports and Games	1.	1.	1.
Singing	.5	.5	.5
Embroidery	1.5	2.75	2.75
Millinery	3.	2.75	5.5
Elocution	..	1.25	..
	27.5	27.5	27.5

more stress on science, mathematics, and drawing, and a little less on practical work. In England the tradition that real skill can be acquired only in the workshop still persists, possibly with less justification than formerly. In part also the New Zealand tendency arises from the somewhat earlier age at which the pupils enter these schools as compared with Great Britain; for in New Zealand the age tends to be 13− rather than, as in England, 13+, or perhaps more correctly 14−. Most of all is it due to the fact that the New Zealand schools are of the non-selective type, whilst in Great Britain entry to the junior technical school is selective, a large proportion of, and in some cases all, the pupils, entering as a result of competition for scholarships and free places, whilst even the few fee-payers are expected to fulfil certain standards of attainment, intelligence, and other factors of suitability.

To suggest any change in practice on the point of non-selective entrance would be to ask New Zealand to abandon a principle of relatively long standing and to change its general outlook. Any recommendation on this point would probably, at present, meet with little success. It seems therefore to be wiser merely to put forward the desirable thesis, that a process of selection is not in the least anti-democratic. On the contrary, the absence of selection inevitably tends to slow down the pace of any school, and thus to diminish the chances of the ablest drawn from any section of society.

In the circumstances one is entitled to remind those concerned that the theoretical, that is, the scientific, instruction in these schools, if not ambitious, should at least be thorough: that the ground, if covered slowly, should be covered well. For science (including fundamental mathematics) cannot be learned in any works; and when full-time school education ceases, time for those studies which enable fitting people to

qualify for professional posts (which all wish to see kept open to the competent drawn from whatever class) is difficult to provide. One very great advantage of an effort to substitute three years in the technical high school for the characteristic two would be that it would allow a sounder basis of mathematical and other theoretical work to be laid, and thus eventually, through the part-time system, enable more students to follow those evening major courses which are the workman's avenue to a professional as distinct from a craftsman's career. This is a policy which should appeal to many New Zealand employers and organisers, who, like their English contemporaries, found their way to the tasks for which intelligence and moral qualities fitted them through the avenue of a part-time education accompanying workshop experience on ordinary economic terms.

The practical instruction given in the workshops struck me as excellent, usually in its methods as well as in its results. It was interesting to find that very often this part of the work was in the hands of old English and Scottish craftsmen, a little gossip with whom formed pleasing interludes. Very often these men had left their homes a generation ago; they know their job, and the difficulty of replacing them is admitted and may become an urgent problem. Most of them had become New Zealanders in outlook and loyalty and were proud of the fact.

It is desirable to repeat that the equipment of the shops on the practical side, whether for metal work or woodwork, was nowhere seriously defective and in a great majority of cases excellent. This is creditable both to the generosity and the enlightenment of the department and to the judgement of the responsible officers in the schools.

2. *Commercial Courses.*—In the four principal technical high schools these are very good, especially if they are re-

garded only as training for office employment; and the same is true of most of the smaller schools. There is no oversupply of this popular and useful form of education: for the pupils readily find posts. From the educational point of view they do this almost too readily. The commercial side is (as elsewhere) usually the largest separate department in the school. A majority of the pupils are girls. In some schools there are no lads in the commercial departments, but in others the percentage of boys is well above the average elsewhere, as some employers for various reasons prefer boys to girls even as shorthand typists.

As a rule, the curriculum is sound. In most cases the pupils take bookkeeping or accountancy as well as the purely craftsman subjects of shorthand and typing. In most cases, too, there is some attempt to teach the underlying descriptive economics of commerce, under whatever name. This is a highly desirable if difficult task. In some cases the teaching of 'commerce' comes very near to the mere explanation of technical terms and abbreviations. In a majority of cases, however, there is some attempt, by following transactions, simple at first but gradually increasing in complexity, to make the actual processes of commercial life intelligible, and to impart some knowledge of basic principle. Where this is not present, the education is best described as 'office' rather than commercial education; and where a large majority of the pupils are girls whose ambition, or fate, is to be shorthand typists for a few years, the process of teaching the descriptive economics of business is, naturally, done against gravity.

In all the cases observed the general education of the pupils in English, in applied arithmetic, and, for instance, in geography, is carried on conscientiously and with a due appreciation of its importance. It was pleasing also to find that in

most cases, at least during part of the course, the girls receive some instruction in domestic subjects, and frequently are also kept in touch with art. The fact that these commercial courses are an integral part of the work of a technical college and that the whole equipment and the staff of the college are, within reasonable limits, at the disposal of each department, is both important and fruitful. It renders a liberal course more practicable than otherwise would be possible.

3. *Domestic Courses.*—Again it must be recorded that as a rule the technical high schools are well equipped on the domestic side, whether for cookery or for the needle crafts. In some cases it may confidently be said that few better equipped kitchens and workrooms exist, or, on any present plane of provision, could be desired. At Dunedin, however, one of the most important, the domestic department is very cramped, and badly needs more space. Most of the teachers in all the principal centres have been well trained in the College of Home Science connected with the University of Otago in Dunedin. They talk intelligently and, with the advantage of their neat uniforms, the hardbitten and ancient visitor found them very attractive. Whilst professing no expert knowledge of cookery, cutting out, or the needle crafts, the same ancient visitor has seen enough of domestic work at home and abroad to be able to commit himself to the statement that the domestic instruction is generally sensible, sound, in accordance with modern tradition, and not infrequently first rate.

These domestic departments have as a rule no trade purpose, for the openings for highly trained professionals on the domestic side are very rare. The demand, for instance, for those trained in institutional cookery or management is strictly limited. A number of girls, however, do enter the dressmaking trades. And some girls go, at least for a time,

into retail trades, whilst the inevitable fortune of most of them is marriage. There can be little doubt, however, that the domestic day courses, including as they do cultural as well as technical work, are of great value to the community. Some of the girls taking these courses are residential, being sent in from the remoter farms, and this fact in itself shows that the work is valued by an important and not always vocal section of the community.

4. *Art Courses.*—Most of the schools have day art departments forming an integral part of the technical high school. In most cases the premises and equipment are adequate. At Wellington and Dunedin they occupy separate blocks, and the day courses there constitute what would be called in England a junior art school. At Auckland and Christchurch the schools of art are separately organised and are not directly related to the technical college. The Christchurch School of Art is connected with the University College there. It is the principal centre for training teachers of art, and has the sole right to grant diplomas for teachers. I regret that I had no time to visit this institution. At Auckland also there is a separate school of art, which I was fortunate enough to see, but art classes are also carried on at the Technical College.

The teaching of art varies considerably, for the mode and purpose of the teaching must always depend more than in most subjects on the constitution of the personnel. In some cases it is very much alive, and is kept in touch with the latest developments in European and especially English art teaching. On the other hand, some of the work seen was old-fashioned, formal, and lacking in life.

The important fact, however, is that, in New Zealand, a considerable amount of the vigorous study of art in most of its manifestations exists. It is pleasing that a pioneer country should be endeavouring, with some success, to follow a

branch of education at least as much concerned with things of the spirit as any other side of education, and more in touch than most.

In addition to the full-time students in these junior art courses, most of the students in other courses are kept in touch with art and take some instruction in drawing.

In the smaller as well as in the four principal colleges, art classes or courses are conducted. As a rule the premises are adequate, and in some cases, for instance, in the new school at Masterton, the art rooms are excellent.

Before leaving the technical high school (that is, the full-time day department of a technical college) for the important evening work, one aspect of the work should be put on record. In the junior technical schools (or their equivalent), especially in Victoria, but also elsewhere in Australia, though time, and probably adequate time, was given to English, one had an uneasy feeling that the subject was not treated with sufficient respect. One almost had the impression that it was a concession to educational opinion, rather than an element included on its merits and pursued with enthusiasm by well-selected and willing teachers. Nowhere in New Zealand did I get this feeling. The fact that the humane element in a technical course was of supreme importance, just because the weight of the course is towards the technical side, was sometimes fully and always willingly admitted. What I saw of the teaching was, though of course insufficient, enough to convince me that English was as well taught as other things, and as a rule by teachers who believed in it, and felt no inferiority to their colleagues in the more academic schools. Moreover, the school libraries were invariably adequate and, in most cases, excellent. The schools and the Department of Education are to be congratulated on the libraries liberally provided and well used.

Free Entry and Its Accompaniments

Education in technical high schools as elsewhere is practically free.[1] And, as already has been noted, the only qualification for entry to a technical high school is that the pupil shall have passed through Form II (formerly called Standard VI) in a primary school. This is usually accomplished at or before the age of 13 years, whilst the age of compulsory attendance is up to 14 years. One consequence of this is that a majority of the pupils in primary schools, their course there terminating as it does at or before the age of 13, pass on to some form of post-primary education, and many of them to the technical high schools.[2]

This has two results to which attention should, I think, be called:

(1) The duration of school life in the technical high schools is short. In 1936, 33 per cent. of the pupils in these schools left during their first year, 34 per cent. left in the second year, 22 per cent. during the third year and 11 per cent. in the fourth. Thus only 33 per cent. of the pupils entered a third year and less than 67 per cent. completed a second year. The result of any system of non-selective entry to the technical high school, coupled with the normal age of commencing in industrial and office life, is, therefore, a very short school life. In 1936 the average length of pupils' stay in a technical high school was two years and one month.

(2) The other result is a tendency to lower standards of work. It is true that, by classification of pupils, where this

[1] Secondary and technical schools cost over £700,000 for the year ending 1937. Of this, nearly half may be attributed to the technical schools, of which the fee income was less than £750. In 1938 the fee income will be smaller owing to an increased provision of free places.

[2] Of 21,800 pupils leaving public primary schools in 1936 (the latest year for which figures are available), 12,800 commenced some form of post-primary education (about 600 other entrants coming from other sources, making the total number 13,400).

is feasible, there is some attempt to do away with the disadvantages of non-selective entry; and on the face of it, at least in the four largest technical high schools, ranging in numbers as they do from about 900 to about 1,500 pupils, there would seem to be the opportunity for effective classification, so that the abler pupils and the less able may each work at a different and a suitable pace. In fact, however, owing to the provision of different types of course, trade, commercial, domestic, rural and so on, the opportunities are divided and, therefore, diminished and seem to be far from universally effective. Classification within a course is often impracticable. Thus the rate of progress, where I was able to sample it, in such subjects as mathematics and science, and doubtless other subjects, was considerably slower than in the selective central schools or in the junior technical schools in Great Britain.

This disadvantage, and for the abler pupils it is real enough, has to be balanced against the widespread opening of post-primary education for a limited time. Under New Zealand conditions I see no mode by which a selective system could be introduced. It has no consonance with fundamental national ideas. Again, the multi-purpose school is, in the conditions, inevitable and, indeed, suitable. So that it is not practicable, by sacrificing variety of course, to increase the possibilities of classification according to ability.

Conclusion

My general verdict, so far as I am qualified to give one, therefore, is that New Zealand has evolved a type of school having some inevitable and some removable disadvantages, but offering nevertheless a preparation for life which takes reasonable account of the probable future career of the great majority of its pupils on the economic side, but not exclusively on that side. After all, there are not many states of which

this could be written, and though we in England have some excellencies which I do not find in New Zealand, I am by no means confident that we solve, or partially solve, the problem of pre-vocational training for anything like so high a proportion of our youth. What we do is to provide better opportunities for a smaller number of the abler children. In this, under our conditions, we may be right.

I think it should also be put on record that New Zealand has in recent years been zealous in providing suitable buildings and equipment, without which technical education, full-time or part-time, is impossible. New technical colleges have been provided where required in the larger centres, like Wellington, but also in a number of the smaller towns: and day and evening departments alike share in the well-chosen equipment, which is characteristic.

The following table is significant. It is from the Report of the Minister of Education, 1936:

EXPENDITURE ON BUILDINGS

	1933–4	*1934–5*	*1935–6*	*1936–7*
	£	£	£	£
Primary Schools	57,664	35,105	87,908	162,894
Secondary Schools	2,568	14,679	23,516	24,092
Technical Schools	1,504	12,851	59,350	77,836

The figures speak for themselves, and lend no support at all to the view that the Department of Education has failed to realise the importance of technical education.

Another matter in which the Department seems to have exercised a wise and truly economical generosity is in the matter of allowances in respect of those children who can attend a technical high school only by boarding in a town. It has increased the allowance for pupils required to board away from home from 5/– a week to 7/6d. as from 30th September, 1937, whilst at the same time the number of pupils in respect of whom these grants were made was increased

from 253 in December, 1936, to 488 in December, 1937. I understand that the numbers are still increasing. This is one way of dealing with the difficult problem of technical as well as other education for children in the 'back blocks.' I was able to visit some of the boarding houses in both large and small urban centres. Those I saw were excellent.

PART-TIME TECHNICAL INSTRUCTION

From the above description of the technical high schools, forming as they do the day departments of the technical colleges, it will rightly be inferred that the substance of any advanced technical education in New Zealand must be carried on in the evening. Unlike most of the Australian States, there is no scheme of universal and compulsory day-time attendance of apprentices. In this New Zealand, like New South Wales, Tasmania, and Great Britain, lags behind the other Australian States and South Africa. Again, unlike Victoria and some other Australian States, there are no advanced 'diploma' courses for day students. It follows that all advanced, in fact, all technical education other than preliminary work of the junior order must be evening work. And provision for evening work, some of it of an advanced order, is made in all the technical colleges and particularly in the four large ones. Some of the advanced work seen was of high quality, and in engineering it led up to the examinations of the Institute of Mechanical Engineers. Some students in other trades prepare for the fairly advanced examinations formerly held in New Zealand by the City and Guilds of London Institute, but now, I am informed, carried on by the Department of Education.

I found that there was every disposition on the part of the Department of Education and of the several technical col-

leges to forward this branch of the work. It was admitted, fully in principle, partially in practice, that without such provision technical education in any full meaning of the term cannot, in New Zealand conditions, exist.

One obstacle has already been dealt with. The fact that there is relatively little manufacture in New Zealand, and even in the larger cities such manufacture as exists is necessarily miscellaneous in character. In the ports—and all the four principal cities are ports of various magnitudes—there is some ship repairing. More important is the manufacture of railway locomotives and rolling stock near Wellington (Hutt Valley or Petone) and at Dunedin. In these places the railway service provides for the technical training of apprentices, either by separate organisation or in the technical colleges. But there is no concentration of industries in particular centres, of the kind which is characteristic in Great Britain or the United States of America. There is obviously no Glasgow, Manchester, Leeds, Birmingham, Huddersfield or Bolton; no Pittsburgh or Detroit. Technical education in New Zealand never presents the simplicity of substantially single manufacture towns, such as Swindon, Crewe or Derby. The four principal centres are all little Londons. They have the disadvantages of the heterogeneity of occupation of the greatest of cities, without the advantages of its size. Auckland can gather together some 3,000 technical students into its evening classes, and the numbers in Wellington, Christchurch, and Dunedin bear a similar creditable relationship to their populations. But these large numbers of students are made up of very numerous small categories (the largest single one being always 'commerce') and the proportion in each category requiring, desiring, or capable of really advanced work is very small. Thus the problem of providing technical education of a high order in New Zealand is most difficult.

And he would be a rash man who, in existing conditions, undertook to improve it by a large factor in quantity or quality.

To return to a second vital matter, I think it certain that the supervisory organisation of the larger technical colleges could be improved. With one possible exception the principals of the technical colleges tend to become too exclusively concerned with their day technical high schools. The largest of the four has over 1,400 full-time day pupils, the smallest more than 900. There are few secondary schools in England much larger than the smallest of the four technical high schools just mentioned, and we believe that 500 or 600 pupils is enough for any school. It is true that some of the English technical colleges (where, again, most of the highest work is part-time evening work) would total up in their various day departments figures of the same order as those just quoted. But most of these would be responsibly managed by definitely appointed heads of departments or schools, under the ultimate responsibility of the principal. The principal of the English technical college would seldom, if ever, concern himself with the admission of junior pupils to a junior technical school or with their conduct when admitted or with their placing during or at the termination of their course or with the difficulties of parents. The departmental head would do all this and be fully responsible for the conduct of the school. But in most cases the principal of any one of the four main colleges does, in fact, and in present conditions must, concern himself with details of the day schools and dissipate his time and energy on these tasks, though he is admirably qualified to concern himself much with the promotion of advanced work. Well prepared to deal with the training of young men in their twenties, he is, in fact, concerned with the education of pupils chiefly under fifteen.

I suggest, therefore, that it is necessary to appoint departmental heads in these institutions, and (where this is already done, as in some cases it is) to give them definite responsibility, and charge them with the detailed administrative work of the department. In one school there is a close approximation to these desirable conditions, with a corresponding economy of the principal's energy. In other cases the principal is not only definitely overworked but overworked upon the wrong things.

Similarly, I think there should be a vice-principal or other officer definitely appointed to have special charge of the evening work, and under the principal and in close association with him, to be responsible for the recruitment of evening students, for keeping in touch with employers and with the local development of industry and generally for lubricating and keeping up to standard the whole machinery of the evening department. Were this done, I think the amount of advanced work could be increased and full advantage would be gained from an organisation which would then be efficient where it is now weakest: in the matter of the part-time advanced classes. This is the one major adverse criticism that seems to be necessary. For the provision of technical education is ample, some of the buildings are excellent and no one of them is bad. (No one could say this of either England or Australia.) Equipment is adequate. Some of the teaching is first rate; most is good; and, though I saw some which might have been more energetic, I saw none that was incompetent.

Evening Courses

The constitution of the evening courses calls for little comment. The courses fall into two classes, which in England would be called major and minor respectively, but in New

Zealand as well as in Australia are usually called professional courses and trade courses.

In the professional course the emphasis is thrown upon theory, the chief and vital function of the practical work and of the material equipment being to illustrate theory. In the trade course, which numerically is the commoner, the emphasis is thrown upon craftsmanship; and the major aim of the course is to make good with the help of the school equipment, the narrow experience which modern workshop practice tends to impose upon those learning a trade. In a typical trade course, the student giving six hours a week (three evenings) to the course would give at least three to practice and would do some trade calculations, a little trade drawing, and, at least in some cases, a little elementary science. In fact, the system is, consciously or not, modelled on the British system; but the numbers in the major and in the minor courses are reversed.

All the larger institutions provide courses of both types in engineering, building trades (usually including carpentry, bricklaying and masonry, and plumbing), cabinet making, commerce (including professional courses for bank clerks, insurance, accountancy, etc., as well as much shorthand and typewriting), painting and decorating. The engineering courses are usually differentiated, as they proceed into mechanical and electrical engineering sections. The 'motor engineering' courses are principally trade courses intended for garage workers, whilst there are sometimes classes for body makers. Courses for both electrical and oxy-acetylene welding are popular. Printing courses are relatively rare and are sometimes held intermittently.

There is every disposition to provide any courses for which there is a reasonable demand. The considerable demand for welding is met not only in the larger but in some of the

smaller places. And the students are often men already engaged in the occupation who wish to widen their range of knowledge. In Auckland a new course in naval architecture has been organised. In that port the amount of shipbuilding is negligible, as it is in the larger port of Wellington, but there is a good deal of repair work, and the construction of small shipping is contemplated. In the sheep-raising areas there are courses in wool-classing, the subject being predominantly a practical one.

The course system as contrasted with single subjects is in general operation, and a course usually covers three evenings of two hours each. The first year's course commonly provides for instruction in English, and in some cases 'general knowledge.' To take the typical example of mechanical engineering, a preliminary course is constituted as follows:

First Year—
English and history *or* English and practical mathematics.
Geometrical drawing.
Elementary science.

Second Year—
English and history *or* English and practical mathematics.
Engineering drawing (junior).
Mechanics (junior).

Students who have satisfactorily completed one year at a post-primary day school are exempted from the first year, as above set out. Students who have satisfactorily completed two years at a technical high school are exempted from both years.

Following these two preliminary years (from which, of course, a large number of students are exempted) there is a three-year minor course. This includes one evening a week at fitting and turning in every year, with mathematics and engineering drawing in the first year, engineering drawing and science in the second year, and engineering drawing and steam in the third year.

There is a special course for railway apprentices. This, significantly, comprises no practical work (fitting and turning), but consists in each of the two years it covers of mathematics, science and engineering drawing. In the second of the two years the science is specifically called mechanics.

There is then a major course extending over six years. Each year comprises three evenings per week of about two hours each, though the first and the fifth year cover four evenings. But in each of these years qualified students may be exempted, in the first year from engineering drawing, and in the fifth from applied mathematics, provided they are sufficiently advanced in these subjects. Substantially, therefore, the courses are three-evening courses more or less similar to those familiar in Great Britain. It may be interesting to set out a typical example:

First Year—
Engineering drawing (special).
Mechanics.
Engineering mathematics.
Electrical engineering (preliminary).

Second Year—
Mechanics (dynamics).
Physics.
Engineering mathematics.

Third Year—
Electrical engineering (grade I).
Physics.
Engineering mathematics.

Fourth Year—
Chemistry.
Calculus.
Elementary strength of materials.

Fifth Year—
Engineering drawing and design.
Chemistry.
Applied mathematics (problems).
English and industrial administration.

Sixth Year—
Properties and strength of materials.
Metallurgy (theory and practice).
Theory of machines.

From the first year of this major course students who have satisfactorily completed three years at a technical high school may be exempted. Those who have passed the matriculation examination may be exempted from first- and second-year mathematics.

Similarly there is a provision of minor and major courses extending over the same period of time in electrical engineering, and there are minor and major courses in radio physics and engineering.

Thus, in that industry for which technical education everywhere is most developed, recourse is had to minor courses, which include a substantial element of workshop practice, and major courses, which are composed entirely of science with engineering drawing, which may be classed as an art. In the major course there is no workshop practice, and the function of the necessary equipment is to illustrate that scientific theory which is the true *differentia* between the professional engineer and the artisan. It is by following the major course that the apprentice who has the requisite intellectual ability and the perseverance and stamina can add to his practical workshop experience the scientific knowledge which fits him for professional responsibility.

It is significant that, in the same school, which may be taken as typical, the course in motor engineering which, allowing for two preliminary years for those who require it, extends over only three years, practical work takes up a third of the allotted time and drawing another third. The motor courses are, in effect, necessarily minor courses, as indeed they are in Australia.[1] These conditions apply also to welding, whether oxy-acetylene or electric arc welding.

To turn to another industry, building, which inevitably

[1] Automobiles are assembled in Australia and in New Zealand. There is at present no manufacture of motor engines, nor of aero-engines.

occupies an important place in every considerable technical college, a preliminary course of the kind set out above is prescribed for those not exempted by previous education. In the building courses there is always a practical element. It would be tiresome to set out the courses in full. The junior course consists of mechanics, together with the theory and practice of carpentry and joinery. The intermediate course consists of building construction and drawing, again with the theory and practice of carpentry and joinery. The advanced course is confined to carpentry and joinery (theory and practice), no doubt of a high order. Similarly, the courses in plumbing consist entirely of technical drawing, together with the principles of plumbing and the practice of plumbing.

It is right to say that in more than one technical college excellent work in carpentry, sometimes in brickwork or masonry, and in plumbing was seen. And the theoretical work implied by the words 'theory and practice' was taken seriously. But apart from the course in sanitary science, not infrequently offered in the colleges, the courses in the building trades tend to be of the minor rather than the 'major' order. This is true to an even greater extent in the courses for cabinetmaking, motor-car body building and panel beating, and painting and decorating, where 'principles' take the form of courses in crafts (or arts), such as lettering and design.

Courses of this type are provided in all the major technical colleges. But there are a good many variations in the exact composition of the courses, caused by differences in local demand and, to some extent, by the personal views of principals or departmental heads. This is as it should be. Again, taking engineering as a type, Auckland, for instance, appears to give rather more alternatives than Wellington, includes (apparently as alternatives) subjects like refrigeration, and

makes special mention of marine engineering drawing, whilst Dunedin apparently sub-divides mechanics and mathematics, makes special mention of hydraulics and, apparently, makes provision for machineshop practice in its major course.

Thus, whilst the Education Department lightly controls the composition of courses, more especially in the preliminary years, their effective composition is left to the individual colleges, with the result that whilst the inevitable constituents of an engineering education are everywhere included, there is variety of arrangement and a reasonable local latitude.

Very important, too, are the commercial and the domestic departments of the evening work. The part-time day commercial courses, as already mentioned, measured by numbers, are the largest courses, I believe, in each major institution.

On the commercial side the courses are often framed as: the bookkeepers' course, the accountancy course, the secretarial course, the shorthand typists' course, and in some cases a salesmanship course. All such courses, except that for shorthand typists, comprise a definite study of 'commerce,' which at its best is the study of descriptive economics on the commercial side, and at its worst may approach the ill-arranged explanation of commercial terms and abbreviations. My strong impression is that there is more of the first than of the second of these alternatives. Shorthand typist courses are generally of the practical kind, with occasional concessions to the teaching of English. Both in bookkeepers' and accountancy courses, mercantile law and particularly company law are included, and there is some teaching of economics. I formed the view that the treatment of the more liberal and scientific sides of commercial teaching was not up to the best English standards, but usually a good deal above the worst. Many of the teachers are graduates of a

university. Evening courses in pharmacy and in horticulture, and, in one or two cases, rural or agricultural courses, complete the picture.

The ordinary evening domestic courses very properly include cookery, needlework, and dressmaking as their more important elements. But in courses sometimes designated as 'home arts' courses, general drawing and various crafts, e. g., pottery, interior decoration and the like, taught usually in conjunction with the art department, are included. The impression I formed is that the principal domestic subjects are well taught, and the general quality and outlook of the domestic teaching reflect considerable credit upon the training provided for domestic teachers, principally at the Otago University College, Dunedin.

Art departments provide evening as well as day work. The provision varies and many conditions are common to day and evening work. In Christchurch there is the most important art school in New Zealand, organised as an entity entirely separate from the Technical College. It is, as I have noted, connected with the University College, and the only institution in New Zealand authorised to issue teaching diplomas. Similarly in Auckland there is a separate art school. In Wellington and Dunedin, on the other hand, the school of art is an integral department of the Technical College. The teaching of art in New Zealand, a pioneer country more remote physically from the traditions of Western art than any other British Dominion, is under obvious handicaps. But my strong impression is that valiant, and not unsuccessful, efforts are being made on the side both of industrial art and of art without qualification, to deal with a difficult but very important problem. Some of the art teaching seen struck one as formal and a little old-fashioned, though this is by no means universally true. The importance of pictorial

and plastic art is recognised by the school authorities. Whether the general public realise in this connection that man does not live by bread alone I cannot say, but the revival of interest in living art in England is of recent origin, if of growing force, and we who have not yet entirely vacated the glass house of indifference should abstain from throwing stones.

No particular mention has yet been made of modern foreign languages. The language almost universally taught, where any at all is taught, is French, though there are occasional classes in German. It is taught for the purpose of enabling students to pass the University Matriculation Examination. This purpose is sometimes fulfilled; and that is all that need be said. To the great mass of New Zealanders a modern foreign language as a spoken tongue can never be of any practical value. But to find an occasional student cultivating French and German because they are the languages of great literatures would be pleasing. Europe is 12,000 miles away. But its literature need not be.

Conclusion

Such is a brief description of some of the detail of the part-time work of the technical colleges. The provision made is as comprehensive as it well can be. And there is every disposition to provide for any established need. The teaching is usually effective. Many of the students are keen. What is required is improved arrangements for the administration, the supervision, and the recruitment of students for the more advanced work, for it must be repeated that in existing conditions all real technical education of other than a preliminary kind in New Zealand is and can be only part-time evening work.

TECHNICAL EDUCATION IN THE SMALLER CENTRES

The foregoing relates principally to the four large technical colleges. But a pleasing feature of technical education in New Zealand is the way in which, in both islands, it has been provided in the smaller centres. Towns often with as small a population as three or four thousand have their technical high schools and technical colleges; and these, of course, are available for the agricultural and pastoral hinterland. In retrospect I look back to this visit to New Zealand with almost unqualified pleasure, but nothing is more pleasant than my recollections of the smaller places and of the work there in progress.

The provision made for the smaller urban centres in New Zealand is, on the average, more comprehensive than it is at home. The chief reason for this is that access to the greater centres in New Zealand is not so easy as it is in our crowded and very highly urbanised island.

To describe these schools in detail is both impossible, within reasonable limits of space, and unnecessary. They are smaller examples of the larger institutions already described. In each case there is a full-time technical high school, which, with the part-time (evening) courses, constitutes the technical college.

The Combined School

In several of these centres (New Plymouth and Napier are examples) the school is what is called a combined school, that is, an original technical school has been combined with the original academic high school. In the instances mentioned the combination has resulted in the abandonment of the mixed school arrangement, and the combined school is for

boys only or for girls only. From the administrative point of view the replacement of four or three schools of higher education by two or even (as is projected in another case) one school is both economical and advantageous. The matter of equipment is also simplified, the technical equipment for the boys being concentrated in one school, and that for girls in another. On the educational side there is a gain too in the facilities for classification made possible by increased numbers. On other educational aspects of the combined school method I should hesitate to generalise, particularly as the number of examples seen, or indeed existing, was small. My impression was that the degree of difference (speaking for the moment of the full-time day school side only) between the combined school and the technical high school was not great. Indeed, in cases where the head of the pre-existing technical high school had become head of the combined school, the technical work had not suffered, and there was, in at least one case, the great material advantage of a new and well-designed building, and modern and generous equipment. So far as I could ascertain, neither had the academic work suffered. I had too small a background of experience in other New Zealand academic high schools to be able to form a confident opinion. In the opposite case of one excellent girls' high school into which the technical high school girls had been absorbed, the purely technical side had suffered because the facilities on the material side were less adequate than was usual in the technical high schools proper. In the particular examples seen the loss on either side caused by the dual objective of the schools was, I think, relatively small, and for the girls it seemed quite likely that the combination, if accompanied by a technical loss, may also have been accompanied by a more than countervailing spiritual gain.

My visits to all the combined schools available certainly

left me opposed to the combination of such schools except in the smaller places, where the numbers seeking post-primary education up to a period above the statutory leaving age are small. In other words, the combined school is to be justified rather on administrative and economical grounds than on educational grounds. A technical school should be technical and the academic school should be academic in their respective aims, though each should temper its major aim by learning from the other. But if numbers allow, schools having one type of objective will always be more effective than schools for which a single general aim is *a priori* impossible. The combined schools, to repeat, should be restricted to the smaller places, where their existence is justified, indeed, probably dictated, by common sense. I can see no case for them in the principal centres of population.

General Description

A description in detail of these smaller technical colleges is unnecessary. Allowing for the difference of scale, they resemble in all essentials the larger colleges already described. There is the same day department, called a technical high school or a combined school, with anything from two to four hundred pupils. There are always evening classes. In the day school there are alternative courses—trade, commercial, domestic, agricultural or some of these. There is the same difficulty that the head is at once in charge of a full-time day school and an evening department, and tends (though the tendency is sometimes successfully resisted) to regard himself primarily as a school headmaster whose chief interests lie in the day work. The tendency, therefore, is for the evening work, where alone advanced instruction can be given, to be less vigorous than it might be. And it is again to be noted

that in these smaller centres there is little scope for technical education of an advanced character.

Agricultural Education

An interesting feature which does call for special comment is the successful agricultural education carried on at some of the schools. The outstanding example, well known in New Zealand, and deserving to be better known elsewhere, is the Feilding Agricultural High School. Feilding is a small town in the North Island of two or three thousand inhabitants. The school, for official purposes, ranks as a technical high school of the ordinary New Zealand type. Locally, it is known for what it is as the Feilding Agricultural High School. Fortunate in its headmaster, the school has adapted itself principally to the needs of a typical New Zealand agricultural environment. The less complimentary way of describing its development is that a vigorous one-track mind has developed a first-class one-track school. The more justifiable description, however, is that a vigorous personality has most successfully, indeed with distinction, realised in practice that such a school as his must find its principal aim in supplying the needs of a predominantly agricultural community and its hinterland. It is a mixed school of about 400 pupils, of whom about 40 are boarders. More than half of the pupils are boys, and of these some 180 are taking the agricultural course. A few pupils take a 'matric.' course (which is rendered possible also for the few agricultural pupils who wish to matriculate), and there is a commercial course, followed chiefly by girls and a few boys, and a domestic course for girls.

From the numbers it will be rightly inferred that so far as the boys are concerned the school is an agricultural school. The majority of the boys, including the boarders, some of

whom come from considerable distances, are the sons of farmers. The course is not a narrow one, but a mere recital of the curriculum in terms of subjects would be misleading. It is a course which, whilst making provision for the very necessary cultural and civic training, relates the mass of the curriculum to the central interest of agriculture. English is taught as English and great importance is attached to it. There is also a course in history, economics, and civics; this is best described as live and realistic civics, taught because these lads will be citizens (a point difficult to forget in New Zealand) as well as farmers. The economics in the early part of the course seems to amount to some general study of the development of agricultural industry in New Zealand and the roots of the industry in older English agricultural practice. Jethro Tull, 'turnip' Townshend, Coke, and Bakewell are names known to these lads. There is an excellent syllabus in applied arithmetic which has a civic as well as a most interesting practical agricultural relationship. Drawing and building construction are based upon farm practice and rural needs, whilst the lads have helped to supply the school farm with model buildings of the most convenient type. Bookkeeping is also taught, with applications of principles to farming requirements. Agriculture and biology follow as a matter of course, with veterinary hygiene, animal husbandry and dairy science. Then there is the all-important study of wool, whilst there are practical facilities for the study of agriculture as a science and art, and an interesting treatment, especially for the senior boys, in agricultural economics. The practical work includes woodwork and metalwork, called engineering, but, in practice, simple and practical metalwork likely to be useful to the farmer. Saddlery and rope work and other elements in farm repair work also figure in the practical programme.

This makes a fairly ambitious programme. It is spread over two years at least. Some lads stay longer than this. But all the work is supplemented, indeed made possible, by practical farming experience. Forty acres adjoining the school, and another 140 acres some little distance away, are cultivated and are well stocked. The school has a great reputation for raising cattle, sheep, and pigs, and it constantly wins prizes at agricultural shows in competition with some of the best farmers in the country. Practically all the farm buildings have been erected by the boys, to whom, therefore, the science of building construction and the trade training have, indeed, reality. Implements are overhauled in the school workshops. Cows are milked and fed under the best conditions. The piggeries are models of these interesting residences. There are sheep yards and a modern dip. The shearing plant is of the modern electric type and the boys do the wool-classing and baling. In fact, agricultural education seems to be the one kind of technical education which can be run in a school on production lines. No school can run a modern shipyard or a locomotive or automobile works, for many reasons which I need not detail. But a school can run a successful farm on an economic basis, and this school does it.

From the point of view of technical education, and probably from most other angles of vision, this is a most successful school; it is of the greatest use to the community and reflects the greatest credit on both the headmaster and the capable staff and on the administration which has made possible such admirable work, work which has gone far past the experimental stage. The headmaster on a recent visit to Great Britain found that he had little to learn, and that the only school at all comparable to his was the relatively new Dauntsey School, which is not a state school. This is no matter for surprise. Agricultural education is differently

constructed and managed in England. We have other ways of meeting the needs of agriculture. But if half-a-dozen of the more purely rural counties at home organised half-a-dozen rural secondary schools of the Feilding type, it would be of great service to an industry which is still the largest single British industry; parents, not infrequently, can learn from their children. New Zealand is a stalwart child of our stout old land, and Feilding has provided us with an example of which we should, in a proper spirit of self-respecting humility, take note. The Dominions, young and vigorous, free from many of our difficulties, ought indeed to be able to teach us much. My indictment of them would be that, in fact, they teach us too little. What they can teach, we should be more than merely ready, we should be eager, to learn.

One cannot omit mention of a new experiment at Feilding, if only because it illustrates a side of 'further education' which the technical colleges have not yet tackled. There has been appointed as a part-time teacher on the staff of the Feilding Agricultural High School a very exceptional man, already and rightly famous for a social survey of the small town in which he was, until recently, resident. The major purpose of his appointment is that together with his accomplished wife he should, during the evenings, organise the non-vocational educational interests of the people of Feilding. Their job is to start an evening one-man or, better, as more properly descriptive of man and wife, an *einmensch* university. They are gathering together those of all ages and classes who wish to study cooperatively without any particular preconceived notion of what should be studied and without any ready-made programme. I was fortunate enough to be able to attend an early meeting (it may have been the first) of this interesting enterprise. It is impossible to describe, still less

to evaluate, this inchoate experiment. But the idea seems to be an excellent one, and I hope that some account of what is or is not achieved will at some relatively early time be made possible. It is not a W.E.A. or university tutorial experiment, but it may open up an entirely new movement in the region of adult education. At least one can confidently say that no better choice of leader was possible or could, probably, be desired; and this, if I may be allowed to say so, is true of both members of the partnership.

One other example of another and, in my judgement, successful method of dealing with the problem now under consideration must be mentioned. Not far from Feilding is Stratford, another small New Zealand town of some five or six thousand inhabitants. The school purports to be a technical high school of the ordinary kind, with a professional (i. e., 'matric.'), a trades, and a commercial course. In fact, the school is one of the best examples I have seen in New Zealand or elsewhere to adapt higher education (alas! chiefly terminating at 15 years of age or a little older) to the needs of the community. It is a combined school, in the sense that it is the high school, as well as the technical high school, of the town and its hinterland. The professional course is the ordinary secondary course; the trades course is the ordinary junior engineering course of the trade type. The general course is designed to give a good all-round education to the non-academic pupil, and perhaps especially to those coming from or destined to a farm environment, but it does not purport to be a definitely agricultural course in quite the same strict sense as that at Feilding. The courses for girls are of the ordinary character and include a commercial and a domestic course. The distinction of the school, which to the best of my observation is an excellent school all-round with a good tone and a strong staff, is the way in which an interest

in agriculture has been woven into the school-work and into all parts of it.

All the boys from whichever course get some agricultural instruction and many of the girls are taught dairy science and get some practical dairying experience. The great merit of the school is not so much that the pupils get agricultural instruction, for this is much less specific and thorough than at the definitely agricultural Feilding School, but that all pupils are *interested* in the predominant industry which is the basis of the town's existence. The school has some twenty acres of land for cultivation. It breeds prize pigs which, again in this instance, win prizes constantly in open competition with the professional breeders, and it maintains a relatively small stock of excellent cattle. It is impossible in a brief report to indicate with precision how the school, whilst making no cultural sacrifices, has managed to create an atmosphere of interest in agriculture, which in turn has resulted in the successful creation of agricultural knowledge in the pupils. In any case it would almost be impossible to state in writing precisely how this is done, as it is, without the existence of a definite agricultural course. But there it is, and I have left few schools with a feeling of greater certainty that the right work was being well done than this Stratford Technical High School. Here again I found an example of what could be accomplished (granted the right leader) in an English rural secondary school.

Conclusion

Space forbids the specific description of the rest of the smaller technical high schools in New Zealand. I visited about a dozen of such schools. No one of them is inefficient. No one of them is really badly housed; the newer buildings are excellent, and the equipment is in all cases adequate, with

the occasional exception of some minor detail. The criticism that I have already passed upon the relatively short school life, and the tendency to put insufficient energy into the organisation of the vocational evening work, applies in greater or less degree to these smaller schools as well as to the larger.

Granted this, I am confident that in the technical high school, viewed as an integral part of the technical college, New Zealand has created a noteworthy and, in New Zealand conditions, a fitting type of school. Whether in the four principal cities there might not be more such schools is not a matter on which an outsider can easily express an opinion. But when all the factors, the small population, the miscellaneous and small-scale industry, the scattered agricultural lands, the difficulties of communication, in which, however, there have been great recent improvements, when all these are considered, it is mere justice to acknowledge that New Zealand has confronted the problem of technical education valorously and successfully. It should cease to apologise for its efforts, and just go on nourishing and forwarding the system it has developed, pruning it, and planting more of it where common sense and practical expediency demand, and meeting pundits, theorists, and logicians with a subdued but confident smile.

On the side of administration the technical colleges and high schools seemed to me to be not unfortunately situated. The local administration is in the hands of local boards, and these seem to have considerable power, e.g., the appointment of the staff is in their hands, subject to the right of veto, seldom exercised except in extreme cases, by the central Education Department. These bodies are quite separate from the local school boards, which still exercise certain powers with regard to primary schools. Thus the control of technical education is divorced from the rest of the system, a situ-

ation wrong in theory, but not resulting, so far as I could observe, in serious practical disadvantage. Finance is provided entirely (apart from voluntary contributions and benefactions) by the central Department, and for technical education there is no local rate or tax. This does not mean, however, that no local funds have been raised. There are cases in which the locality has made itself responsible for part, usually a small part, of the cost of a new technical school or college.

Inspection is in the hands of the central Department and there are two technical inspectors who receive some assistance from specialists on the side of domestic and physical education. These are competent officers, but an inspectorate of these dimensions cannot, of course, supply the detailed specialist advice available in England, where some forty technical inspectors furnish highly specialised advice and criticism on each principal side of a technical curriculum. The difficulty, of course, arises out of the dimensions of New Zealand education.

The system of 'classification' of teachers on the technical side is relatively simple. It seems to be without the deadening effects which are, to the British mind, so deplorable in connection with the primary and possibly the other high schools. It is not the case on the technical side that promotion and movement depend entirely, or at least predominantly, on the teacher's place upon a classified list. Nor is it, in the technical colleges and schools, a fact that an eventual headship depends principally upon the passage of time. Nor, as is sometimes the case in Australia, does the seniority system result in a post requiring qualifications of one kind being filled by teachers as ironically unsuited by training, knowledge, and experience as can well be imagined. The classification system, with its deadening consequence of

promotion by efflux of time, seems to work worst in the primary schools.

One further remark seems to be justified. If an educational system can be judged by the results in day-to-day matters visible to the ordinary traveller, that of New Zealand must take a high place. But I believe that the system, especially on the primary side, could be greatly improved by certain administrative changes.

The man in the street, of both sexes, is pleasant, courteous, and relatively well informed. His speech is not unpleasing. Some people have found him dull and slow. But these critics are from those lands of bright sun and effervescent atmosphere which may account for their own flamboyant and almost excessive heartiness. An Englishman, however, finds this absence of unintermittent talk, this relatively quiet and reserved bearing, the inclination to abstain from slapping a new acquaintance too instantaneously and too heartily upon the back, by no means strange. And he enjoys not being questioned too eagerly nor too often upon his views of a country where he has been temporarily resident for a metaphorical five minutes. Judged by casual observation, the number of bookshops per thousand inhabitants must be as great in New Zealand as it is anywhere, and the percentage of serious books exhibited, stocked, and doubtless bought, must be relatively as high and perhaps even higher than in reasonably comparable parts of Great Britain or other Dominions. The press too, especially if one remembers the possible circulation, is of high quality, with little sensationalism, and editorial writing of a high calibre. Everyone of the four principal cities has at least one (and often two) solid, well-written daily paper, and I was surprised both at the numbers and at the quality of the papers published in the smaller towns. If the absence of sensationalism and the presence of well-written

editorial columns and sound criticism in the press are evidence of a conservative outlook, may such conservatism endure. In some other respects the country cannot be accused of conservatism. An educational system which furthers the conditions described must have many merits.

The view that I formed—and two months in New Zealand entitles me to only a tentative opinion—is that the educational danger is not that the education of the young of all types and ages is insufficiently practical or 'realistic.' The danger is that, in the commendable effort to fit education to environment, to open an avenue to higher education free to all citizens without any, or at least any considerable, process of selection, the interests of the very able few, and especially the few for whom non-vocational culture of the highest type is desirable, may be neglected. It is not only desirable but essential that there should be generous facilities for technical education, and the antithesis between cultural and vocational training is usually a false one. Similarly, it is highly desirable and essential that in the academic high school there should be facilities for practical work of various kinds and that for a majority of the pupils a literary tradition, as narrow in its conception, possibly, as the modern scientific training often is, should be discarded. There has been a movement in New Zealand, as elsewhere, and a necessary movement, away from literary and classical tradition. But pendulums have a habit of swinging and may swing too far. It is as democratic to secure that those fitted for a humanistic training of the highest (and most difficult) type should be able to obtain it, as to see that everyone, whatever his income or position, should have a free avenue to post-primary education. The intellectual *élite* should be selected wherever it can be found, and to make such selection as possible for the son or daughter of the cobbler or the cowman as it is for the child

of the successful professional man, the wealthy merchant, or the big landholder is entirely right. Such a possibility should exist. And, as in some other Dominions, the non-selective character of education seems to me to involve some danger that it may disappear. To deal with this problem in detail would require a separate report, not is it any part of my present responsibility. But to omit a cautionary mention of the problem would be disingenuous and wrong.

APPENDIX

I

VICTORIA: JUNIOR TECHNICAL SCHOOL

First Year—

Group	*Subject*	*Periods of 40 Minutes*
English	English	5
	Geography	2
	History, Civics and Hygiene	3
Mathematics	Arithmetic and Mensuration	5
	Algebra	3
Science	Elementary Science	5
Art	Free Drawing	2
	Modelling	2
Instrumental Drawing	Plane Geometry	3
	Solid Geometry	
Practical Work	Woodwork	4
	Sheetmetal Work	4
School Activities	Singing	4
	Sports	
	Physical Drill	
	Assemblies, etc.	
	Total	42

Second Year—

Group	*Subject*	*Periods of 40 Minutes*
English	English	5
	Geography	2
	History, Civics and Hygiene	3
Mathematics	Arithmetic and Mensuration	3
	Algebra	3
	Theory of Geometry	3
Science	Electricity and Magnetism	5
	Physics and Chemistry	
Art	Free Drawing	2
	Modelling	2
Instrumental Drawing	Solid Geometry	2
	Instrumental Drawing	2
Practical Work	Woodwork	3
	Machine Shop Engineering	3
School Activities	Singing	4
	Sport	
	Physical Drill	
	Assemblies, etc.	
	Total	42

Third Year—

Group	*Subject*	*Periods of 40 Minutes*
English	English	4
	Economics	1
Mathematics	Algebra	3
	Theory of Geometry	2
	Trigonometry	2
Science	Electricity and Magnetism	8
	Physics and Chemistry	
Instrumental Drawing	Solid Geometry	2
	Building Drawing or Engineering Drawing	4
Practical Work	Woodwork	12
	Applied Art Work or Machine Shop Engineering	
	Electrical Fitting	
School Activities	Singing	4
	Sport	
	Physical Drill	
	Assemblies, etc.	
	Total	42

The first two years of the course are common for all students. In the third year specialisation in practical work and drawing takes place.

During the course of study there are visits to industrial works and places of general educational interest, sports meetings, school picnics, concerts, community singing, assemblies, club meetings, hobby exhibitions, etc., and the physical and social side of a boy's education is not neglected.

At the end of the second year the Merit Certificate may be gained in the same way as it is gained in any other Government school. The certificate, however, which the student prepares for is the Junior Technical Certificate, which is a much higher standard. At the end of the third year the Intermediate Technical Certificate may be gained.

II

VICTORIA: TRADE COURSES FOR ENGINEERING APPRENTICES

FIRST SCHEDULE

CLASSES FOR INSTRUCTION IN THE SUBJECTS OF THE APPRENTICESHIP COURSE FOR THE TRADES OF FITTING AND/OR TURNING AND MACHINIST

First Year—		*Hours Per Week*	
Trade Mathematics	Grade I.	1	1 half day and 2 evenings.
Trade Drawing	Grade I.	2	
Trade Science	Grade I.	1	
Trade Theory	Grade I.	1	
Trade Practice	Grade I.	3	
Second Year—			
Trade Drawing	Grade II.	2	1 half day and 2 evenings.
Trade Science	Grade II.	1	
Heat Treatment	Grade I.	1	
Trade Theory and Calculations	Grade II.	1	
Trade Practice	Grade II.	3	
Trade Drawing (optional on additional evening)	Grade II.		
Third Year—			
Trade Theory and Calculations	Grade III.	1	2 evenings.
Trade Practice	Grade III.	2	
Heat Treatment	Grade II.	1	
Trade Practice (optional on additional evening)	Grade III.		
Fourth Year (for Apprentice Fitters)—			
Welding (Theory and Practice)		4	2 evenings.
Heat Treatment (optional on additional evening)	Grade III.		
Trade Practice (optional on additional evening)	Grade IV.		
Fourth Year (for Apprentice Fitters and Turners, Turners and Machinists)—			
Trade Theory and Calculations	Grade IV.	4	2 evenings.
Trade Practice	Grade IV.		
Welding (optional on additional evening).			
Heat Treatment (optional on additional evening)	Grade III.		
Trade Practice (optional on additional evening)	Grade IV.		

The detailed syllabus of the above-mentioned subjects shall be as determined by the Commission from time to time.

SECOND SCHEDULE

CLASSES FOR INSTRUCTION IN THE SUBJECTS OF THE APPRENTICESHIP COURSE FOR THE TRADE OF PATTERNMAKING

First Year—		*Hours Per Week*	
Trade Mathematics	Grade I.	1	1 half day and 2 evenings.
Trade Drawing	Grade I.	2	
Trade Science	Grade I.	1	
Trade Theory	Grade I.	1	
Trade Practice	Grade I.	3	

Second Year—

		Hours Per Week	
Trade Drawing	Grade II.	2	1 half day and 2 evenings.
Trade Theory and Calculations	Grade II.	1	
Trade Practice	Grade II.	3	
Foundry Practice	Grade I.	2	

Third Year—

Trade Theory and Calculations	Grade III.	4	2 evenings.
Trade Practice	Grade III.		
Foundry Practice (optional on additional evening).			
Trade Drawing (optional on additional evening).			

Fourth Year—

Trade Theory and Calculations	Grade IV.	4	2 evenings.
Trade Practice	Grade IV.		
Trade Drawing (optional on additional evening).			

The detailed syllabus of the above-mentioned subjects shall be as determined by the Commission from time to time.

THIRD SCHEDULE

CLASSES FOR INSTRUCTION IN THE SUBJECTS OF THE APPRENTICESHIP COURSE FOR THE TRADE OF BRASSFINISHING

First Year—

		Hours Per Week	
Trade Mathematics	Grade I.	1	1 half day and 2 evenings.
Trade Drawing	Grade I.	2	
Trade Science	Grade I.	1	
Trade Theory	Grade I.	1	
Trade Practice	Grade I.	3	

Second Year—

Trade Drawing	Grade II.	2	1 half day and 2 evenings.
Trade Science	Grade II.	2	
Trade Theory and Calculations	Grade II.	1	
Trade Practice	Grade II.	3	

Third Year—

Trade Theory and Calculations	Grade III.	4	2 evenings.
Trade Practice	Grade III.		
Foundry Practice (optional on additional evening).			
Trade Practice (optional on additional evening)	Grade III.		

Fourth Year—

Trade Theory and Calculations	Grade IV.	4	2 evenings.
Trade Practice	Grade IV.		
Trade Practice (optional on additional evening)	Grade IV.		
Welding (optional on additional evening).			

The detailed syllabus of the above-mentioned subjects shall be as determined by the Commission from time to time.

FOURTH SCHEDULE

CLASSES FOR INSTRUCTION IN THE SUBJECTS OF THE APPRENTICESHIP COURSE FOR THE TRADE OF BLACKSMITHING

		Hours Per Week	
First Year—			
Trade Mathematics	Grade I.	1	1 half day and 2 evenings.
Trade Drawing	Grade I.	2	
Trade Science	Grade I.	1	
Trade Theory	Grade I.	1	
Trade Practice	Grade I.	3	
Second Year—			
Trade Drawing	Grade II.	2	1 half day and 2 evenings.
Trade Science	Grade II.	1	
Trade Theory and Calculations	Grade II.	1	
Trade Practice	Grade II.	4	
Third Year—			
Trade Science	Grade III.	1	2 evenings.
Trade Theory and Calculations	Grade III.	1	
Trade Practice	Grade III.	2	
Trade Practice (optional on additional evening)	Grade III.		
Fourth Year—			
Trade Theory	Grade IV.	4	2 evenings.
Trade Practice	Grade IV.		
Trade Science (optional on additional evening)	Grade IV.		

The detailed syllabus of the above-mentioned subjects shall be as determined by the Commission from time to time.

FIFTH SCHEDULE

CLASSES FOR INSTRUCTION IN THE SUBJECTS OF THE APPRENTICESHIP COURSE FOR THE TRADES OF COPPER AND/OR BRASS SMITHING

		Hours Per Week	
First Year—			
Trade Mathematics	Grade I.	1	1 half day and 2 evenings.
Trade Drawing	Grade I.	2	
Trade Science	Grade I.	1	
Trade Theory	Grade I.	1	
Trade Practice	Grade I.	3	
Second Year—			
Trade Mathematics	Grade II.	1	1 half day and 2 evenings.
Trade Drawing	Grade II.	2	
Trade Theory	Grade II.	1	
Trade Practice	Grade II.	4	
Third Year—			
Trade Theory, Calculations, and Drawing	Grade III.	4	2 evenings.
Trade Practice	Grade III.		
Trade Practice (optional on additional evening)	Grade III.		
Fourth Year—			
Trade Theory and Practice	Grade IV.	2	2 evenings.
Welding		2	
Trade Practice (optional on additional evening)	Grade IV.		

The detailed syllabus of the above-mentioned subjects shall be as determined by the Commission from time to time.

III

VICTORIA: TYPICAL EVENING COURSES

Mechanical Engineering

Based on 3 evenings per week attendance at School, as far as possible.

Entrance qualification to be the satisfactory completion of a two years' course in a Junior Technical School or its equivalent.

Students who have satisfactorily completed the full three years' course prescribed for Junior Technical schools, or have the Intermediate Certificate, may enter upon the work of the 2nd year.

Students who have not reached the entrance standards required should enter the evening preparatory classes for English, Mathematics, Science, and Instrumental Drawing, which should be taught up to the standard reached in these subjects in the 2nd year of the Junior Technical day course.

	Approximate Evenings
First Year—	
Mathematics (Preliminary)	1
A. Algebra.	
B. Geometry.	
Elementary Science (3rd Year Junior Technical Syllabus)	1
Mechanical Drawing (3rd Year Junior Technical Syllabus)	1
Second Year—	
Mathematics, Grade I	1
A. Algebra.	
C. Trigonometry.	
Physics (A) Mechanics and Heat with Laboratory Work	1
Engineering Drawing, Grade I	1
Third Year—	
Applied Mechanics, Grade II., with Laboratory Work	1
Heat Engines, Grade I.	1
Engineering Drawing, Grade II.	1
Mathematics, Grade II. (Optional).	
Fourth Year—	
Applied Mechanics, Grade III. (Machines)	1½
Engineering Drawing, Grade III. (Machines)	1½
Heat Engines, Grade II.	1

Students who have completed the above course must produce evidence of having had 4 years of approved practical experience before a Course Certificate will be issued to them.

Municipal and Hydraulic Engineering

Based on 3 evenings per week attendance at School, as far as possible.

Entrance qualification to be the satisfactory completion of a two years' course in a Junior Technical School or its equivalent.

Students who have satisfactorily completed the full three years' course prescribed for Junior Technical schools, or have the Intermediate Certificate, may enter upon the work of the 2nd year.

Students who have not reached the entrance standards required should enter the evening preparatory classes for English, Mathematics, Science, and Instrumental Drawing, which should be taught up to the standard reached in these subjects in the 2nd year of the Junior Technical day course.

	Approximate Evenings
First Year—	
Mathematics (Preliminary)	1
A. Algebra.	
B. Geometry.	
Elementary Science (3rd Year Junior Technical Syllabus)	1
Mechanical Drawing (3rd Year Junior Technical Syllabus)	1
Second Year—	
Mathematics, Grade I.	1
A. Algebra.	
C. Trigonometry.	
Physics (A) Mechanics and Heat with Laboratory Work	1
Engineering Drawing, Grade I.	1
Third Year—	
Applied Mechanics, Grade II., with Laboratory Work	1
Surveying, Grade I.	1
Engineering Drawing, Grade II.	1
Civil Engineering, Grade I.	1
Fourth Year—	
Applied Mechanics (Structures), Grade III.	1
Engineering Drawing (Structures), Grade III.	1
Surveying, Grade II.	1
Fifth Year—	
Hydraulics, Part I.	1
Civil Engineering, Grade II.	1
Geology, Grade I.	1

Students who have completed the above course must produce evidence of having had 4 years of approved practical experience before a Course Certificate will be issued to them.

Electrical Engineering

Based on 3 evenings per week attendance at School, as far as possible.

Entrance qualification to be the satisfactory completion of a two years' course in a Junior Technical School or its equivalent.

Students who have satisfactorily completed the full three years' course prescribed for Junior Technical schools, or have the Intermediate Certificate, may enter upon the work of the 2nd year.

Students who have not reached the entrance standards required should enter the evening preparatory classes for English, Mathematics, Science, and Instrumental Drawing, which should be taught up to the standard reached in these subjects in the 2nd year of the Junior Technical day course.

	Approximate Evenings
First Year—	
Mathematics (Preliminary)	1
A. Algebra.	
B. Geometry.	
Elementary Science (3rd Year Junior Technical Syllabus)	1
Mechanical Drawing (3rd Year Junior Technical Syllabus)	1
Second Year—	
Mathematics, Grade I.	1
A. Algebra.	
C. Trigonometry.	
Physics (A) Mechanics and Heat with Laboratory work	1
Physics (C) Electricity and Magnetism, Grade I., with Laboratory Work	1
Engineering Drawing, Grade I.	1
Third Year—	
Electrical Technology, Grade II., with Laboratory Work	1
Mathematics, Grade II., "A" Algebra	1
Engineering Drawing, Grade II.	1
Applied Mechanics, Grade II., with Laboratory Work	1
Fourth Year—	
Heat Engines, Grade I.	1
Electrical Technology, Grade III,. with Laboratory Work	1
Engineering Drawing, Grade III.	1

Students who have completed the above course must produce evidence of having had 4 years of approved practical experience before a Course Certificate will be issued to them.

Mechanical Draughtsmanship

Based on 3 evenings per week attendance at School, as far as possible.

Entrance qualification to be the satisfactory completion of a two years' course in a Junior Technical School or its equivalent.

Students who have satisfactorily completed the full three years' course prescribed for Junior Technical schools, or have the Intermediate Certificate, may enter upon the work of the 2nd year.

Students who have not reached the entrance standards required should enter the evening preparatory classes for English, Mathematics, Science, Instrumental and Freehand Drawing, which should be taught up to the standard reached in these subjects in the 2nd year of the Junior Technical day course.

	Approximate Evenings
First Year—	
Mathematics (Preliminary)	1
A. Algebra.	
B. Geometry.	
Elementary Science (3rd Year Junior Technical Syllabus)	1
Practical Plane and Solid Geometry, and Freehand Drawing and Lettering	1
Mechanical Drawing	1
Second Year—	
Mathematics, Grade I	1
A. Algebra.	
C. Trigonometry.	
Physics (A) Mechanics and Heat with Laboratory Work	1
Engineering Drawing, Grade I.	1
Third Year—	
Heat Engines, Grade I.	1
Applied Mechanics, Grade II., with Laboratory Work	1
Engineering Drawing, Grade II.	1
Mathematics, Grade II. (Optional).	
Fourth Year—	
Applied Mechanics, Grade III. (Machines)	1
Engineering Drawing, Grade III. (Machines or Structures)	1 to 2
Heat Engines, Grade II.	1

IV

NEW SOUTH WALES: TYPICAL DIPLOMA COURSES

Mechanical Engineering

The following is an outline of the Mechanical Engineering Diploma Course, showing the subjects embraced in each stage and also the class time-tables. Each stage is covered in one year, the whole course being of four years' duration.

Subject	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
		Stage I			
Chemistry—1a and 1b	..	..	..	..	6.45–9.15
Physics III	..	..	7–9.30	..	..
Engineering Drawing and Design I.	6–9	..	..	..	..
Mathematics—Applied I	..	*7–9	..	*7–9	..
		Stage II			
Mathematics—Applied II	..	..	6–7	6–7	..
Engineering Drawing and Design II	..	..	..	..	6–9
Workshop Practice—First Term...	..	..	7–9	..	..
Applied Mechanics II	..	..	..	7–8	..
Heat Engines I	..	..	..	8–9	..
Laboratory Work to Roster—Second and Third Terms	..	..	7–9	..	..
Chemistry 4a and 4b	..	6.45–9.15	..	..	..
		Stage III			
Engineering Drawing and Design III	..	..	..	..	7–9
Applied Mechanics III	7–8	..	..	..	..
Heat Engines II	6–7	..	..	..	..
Workshop Practice	..	..	..	7–9	..
Applied Mechanics III	Tutorial	6–8	..	..	..
Heat Engines II	Tutorial				
		Stage IV			
Engineering Drawing and Design IV	7–9	..	7–8	..	6–8
Electrical Engineering X	..	..	8.30–9.30	..	..

* Alternative times.

Local Government Engineering

Each stage is covered in one year, the whole course being of five years' duration.

Subject	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
Stage I					
Chemistry 1a and 1b	..	..	..	..	*5.30–8 or *7–9.30
Physics III	7–9.30	..	..	..	..
Applied Mathematics I	..	..	..	7–9	..
Engineering Drawing and Design I	..	..	6–9	..	..
Stage II					
Chemistry 4a and 4b	*5.30–8 or *7–9.30	..	..	..	..
Applied Mathematics II	..	..	6–7	6–7	..
Applied Mechanics (first and second terms)	..	..	7–8	..	..
Heat Engines I	..	..	8–9	..	..
Heat Engines and Applied Mechanics (Laboratory — second and third terms)	..	..	..	7–9	6–9
Engineering Drawing and Design II (Workshop Practice—first term)	..	..	..	7–9	..
Stage III					
Engineering Drawing and Design IV	7–9	..	7–8†	..	6–8
Hydraulics	..	..	..	6–7	..
Electrical Engineering*	..	..	6–7	..	..
Surveying I and II‡	..	..	..	7–9	..
Hydraulics (Laboratory Work—second term)	..	..	7–9	..	..
Stage IV					
Engineering Construction I	..	6.30–8.30	..	..	..
Engineering Drawing and Design V	7–9	..	6–8	..	..
Road Construction	..	..	..	7–9	..
Stage V					
Water Supply, Sewerage and Public Health Engineering (first and second terms)	6–7.30	..	..	..	..
(Third term)	6–7	..	..	..	..
Geology I	..	7.15–9.15	..	..	..
Engineering Construction II (including Bridge Building)	..	..	..	..	6–8
Engineering Administration (third term only)	7–9	..	..	..	..
Surveying III and IV	..	..	6.30–8.30	..	..
Town Planning (first term only)	7.30–8.30	..	..	..	..
Local Government Engineers—Law (second term only)	7.30–8.30	..	..	..	..

* Alternative times. † First and third terms only. ‡ Field work in week-ends.

Aeronautical Engineering

This is a course of five years, of which the first two are similar to the Mechanical Engineering Diploma. The remaining three years include Aerodynamics, Structures, Aero Engines, Applied Mathematics, etc.

Architecture

The following is an outline of the Architecture Diploma Course showing the subjects embraced in each stage, and also the class time-tables. Each stage is covered in one year, the whole course, as already mentioned, being of six years' duration:

Subject	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
Stage I					
Descriptive Geometry (Applied to Architecture)	..	7–9	..	..	..
History of Architecture I (Pre-Classic—Classic)	..	..	..	6–7	..
Architectural Drawing I (Classic Studies)	7–9	..	..	..	..
Construction Theory I	..	..	..	8–9	..
Construction Drawing I	..	..	7–9	..	..
Rendering and Ornament	..	..	..	7–8	..
Stage II					
History of Architecture II (Mediaeval)	..	..	6.30–7.30	..	..
*Architectural Drawing II (Measured Studies)	..	..	..	7–9	..
Construction Theory II	..	..	8–9	..	..
Construction Drawing II	..	7–9	..	..	..
Freehand Drawing II (Architectural Ornament)	7–9	..	..	..	..
Modelling I (Architectural Ornament)					
Stage III					
History of Architecture III (Renaissance to Present Day)	..	6.15–7.30	..	..	..
Architectural Design	..	..	..	6–9	..
Architectural Drawing III (Renaissance Studies)	..	7.30–9	..	..	..
Construction III (Theories and Application of Stresses)	..	..	6–7.30	..	..
Construction Drawing III (Structural Design)	..	..	7.30–9	..	..
Freehand Drawing III (Ornament and Antique)	7–9	..	..	..	..
Modelling II (Antique)					
Stage IV					
Architectural Design	..	..	Theory, 7–8 Studio, 8–9	7–9	..
Constructional Design	7–9	..	..	..	..
Sanitation of Buildings I and II	..	6.45–9.15	..	..	..
Stage V					
Architectural Design	7–9	..	..	7–9	..
Quantity Surveying (optional)	..	..	7–9	..	..
Professional Practice	8–9†	..	..	..	..
Specification Writing	..	..	..	6–7	..
Town-Planning (1st Term)	8–9	..	..	..	..
Services and Utilities	..	Times to be arranged		..	..
Stage VI					
Architectural Design	..	7–9	..	7–9	..

* Measured Studies—Alternate Saturdays (morning and afternoon). † Second and Third term only.

Building

This course is one involving five years of evening study. It provides opportunities for a sound theoretical training in the materials and principles of building construction and structural design. The course is a very suitable one for cadets in the service of Master Builders, and in its establishment their needs have been kept in view. It supposes that those taking it are concurrently gaining general building experience and, in fact, only those who are getting it are eligible for admission to the course. Moreover, those proposing to follow the course must be able to show that they have the necessary educational preparation. The standard demanded is the same as that for the Diploma Course.

The Course has been endorsed by the Master Builders' Association of New South Wales as a suitable and complete one in Building and as one which has their full support.

The following is an outline of the Course, showing the subjects embraced in each stage, and also the class time-tables. Each stage is covered in one year, the whole Course, as already mentioned, being of five years' duration:

Subject	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
		Stage I			
Descriptive Geometry (applied to Architecture and Building)	..	7–9	..	..	..
Building Construction I	..	..	..	7–8	..
Building Construction Drawing I	7–9	..	7–9	..	..
		Stage II			
Building Construction II (particularly materials)	..	..	8–9	..	..
Building Construction Drawing II	7–9	7–9	..	..	..
Freehand Drawing II	..	..	..	7–9	..
		Stage III			
Building Construction III (the theory and application of stresses)	..	..	6–7.30	..	..
Building Constructional Drawing III (structural design)	7–9	..	7.30–9	..	..
		Stage IV			
Constructional Design (including steel and reinforced concrete)	7–9	..	..	..	..
Sanitation of Buildings I and II	..	6.45–9.15	..	..	..
Quantity Surveying	..	..	7–9	..	..
		Stage V			
*Surveying I	7–9	..	..	..	..
Estimating and Costing	..	..	..	7–9	..
*Building Practice Acts, etc	7–8	..	..	..	..
*Building Accountancy	..	..	..	..	..
Bookkeeping	..	..	7–9	..	..

* 1½ Terms each.

GENERAL TIME TABLE

Subject	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
		STAGE I			
Construction Drawing—					
Diploma	..	..	7–9	6–8	..
Higher Trades	7–9	..	..	..	..
Miscellaneous	..	6.30–8.30	..	7–9	7–9
		STAGE II			
Construction Drawing—					
Diploma	..	7–9	..	..	..
Higher Trades	7–9	..	..	..	..
Miscellaneous	7–9	7–9	..	..	7–9
		STAGE III			
Construction Drawing—					
Diploma	7–9	..	7.30–9	..	..
Foremen	7–9	..	7–9	..	..
		STAGE I			
Building Construction—					
Diploma	..	..	..	8–9	..
Higher Trades	..	8–9	..	..	..
Miscellaneous Building	..	8–9	..	..	..
Special Courses	7–8	..	..	..	..
		STAGE II			
Building Construction—					
Diploma	..	..	8–9	..	..
Higher Trades / Miscellaneous Building	..	6.45–7.45	..	..	..
		STAGE III			
Building Construction—					
Diploma	..	..	6–7.30	..	..
Foremen	..	..	..	6.15–7.45	..

V

QUEENSLAND: TYPICAL COURSES

Diploma Course in Mechanical Engineering

	Required No. of Hours Per Week
First Year—	
Mathematics—Algebra, Geometry, and Trigonometry	6
Engineering Drawing, Stage I	3
Second Year—	
Physics, Stage I	3
Mechanics (Applied Mathematics)	3
Engineering Drawing, Stage II	3
Third Year—	
Physics, Stage II	3
Applied Mechanics	3
Engineering Drawing and Machine Design, Stage III	4
Fourth Year—	
Heat Engines	3
Electrical Engineering	6
Engineering Drawing and Machine Design, Stage IV	4

Apprenticeship Courses in Blacksmithing and Coachsmithing

	Hours Per Week
First Year—	
Trade Mathematics, Stage I	1
Trade Drawing	1
General Science	1
Trade Work (Theory and Practical)	2

Trade Work

Theory

The Forge.—How to build and keep a good fire for ordinary work; blacksmith's tools and their uses; upsetting; scarfing; welding; fluxes; tempering and annealing steel.

Practice

Forging different points—square, round, and chisel.
Forging staple ¼ inch round.
Forging knee bend ¾ inch by ½ inch.
Welding round stock ½ inch to ⅝ inch.
Forging gib-headed keys.
Forging eye bolt ½ inch round.
Forging ring ½ inch round.
Forging square band ½ inch square.
"T" weld 1½ inch by ⅜ inch or ½ inch.
Corner weld 1½ inch by ⅜ inch or ½ inch.
Forging tongs.
Forging gate hinges and hook.
Welding links or other details (arrange to suit the ability of the students).
Dressing hot and cold sets.

Second Year—	*Hours Per Week*
Trade Mathematics, Stage II	1
Mechanical Drawing, Stage I	2
Trade Work (Theory and Practical)	2

IMPORTANT DATES IN HISTORY OF TECHNICAL EDUCATION IN AUSTRALIA[1]

New South Wales	Victoria	South Australia	Queensland	West Australia	Tasmania
		1861 School of Design under Society of Arts. (In 1881 placed under control of Museum and Art Galleries Board and in 1906 under Education Department.)			Has developed largely under the influence of Victoria. At first separate technical schools or schools of mines were established under boards subsidised by the Government. In 1916 a special commission on technical education recommended the Victorian form of organisation with an inspector of technical schools appointed by the Education Department. Tasmania is the only State with compulsory training of apprentices.
1865 Mineralogy, geology, to design, chemistry, 1871 introduced at Mechanics School of Arts, Sydney (which later became the Sydney Technical College).	1868 Parliament voted £200 a year to promote industrial education.				
	1869 Royal Commission to report on Tech. Edn. Became permanent controlling body.				
	1870 Ballarat School of Mines.				
	1873 Bendigo School of Mines.	1876 Evening classes for mechanics started by Chamber of Manufacturers and taken over by Council of Education.	1881 Brisbane School of Arts established with night classes in mech. drawing.		
1883 Tech. Edn. Board appointed and tech. classes established in two city centres.			1882 Technical College established (on model of Sydney Technical College).		
1884 Classes in geology and mineralogy at Newcastle.	1885 Schools of Mines to established at 6				
1885 Classes at Bathurst and Goulburn.	1890 additional country centres.	1888 Gawler School of Mines.			
1889 Tech. Edn. Board dissolved. Work placed under Educ. Dept. with Tech. College as headquarters.	1887 Trade subjects introduced at Melb. Working Men's Col. and Gordon Tech. Institute (Geelong).	1889 Adelaide School of Mines and Industries.		1896 Classes for employees in railway workshops.	
	1890 Educ. Dept. took over control of tech. education.	1891 Three provincial to Schools of Mines	1900 District Schools of to Arts estab. classes	1900 Perth Tech. School opened.	
	1899 Royal Commission to on tech. education	1904 established.	1902 in technical subjects.		
1904 Knibbs Report (unfavourable to apprenticeship training).	1901 (recommendations for improving apprenticeship).		1902 Board of Technical Education set up.	1902 Kalgoorlie School of Mines.	
		1912 Commission on shortage of labour drew attention to lack of facilities for technical training.	1905 Education Department assumed control of technical education.		
	1914 Establishment of number of Junior Tech. Schools commenced.	1917 Tech. Ed. of Apprentices Act passed (applied for first time to woodwork, ironwork, printing 1919, to plumbing 1926).			
1918 Board of Trade established with powers over apprenticeship.				1916 Examinations introduced for apprentices in certain trades.	
1922 Board of Trade reports on unsatisfactory conditions of apprenticeship.					
	1927 Apprenticeship Commission (under Dept. of Labour) set up by special Act.	1927 Adelaide Technical College.	1924 Apprentices and Minors Act (amended 1929).	1925 Arbitration Act amended to provide half day instruction per week for apprentices.	
1933 Commission of Enquiry into Technical Education.					
1936 Advisory Councils (representing employers and workers) to act in conjunction with tech. colleges.	Day classes for Apprentices established.		Day classes for Apprentices established.		
1937 Establishment of full-time day preapprenticeship classes for pupils with at least two years of secondary schooling.				1938 Royal Commission on Youth Employment and Apprenticeship.	

[1] *Compiled* by Dr. K. S. Cunningham, Australian Council for Educational Research.

P-161