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An Essay in Educational Reconstruction

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TO

MY FATHER

PREFACE

The substance of the following pages formed a special series of broadcasts from All India Radio, Delhi, in July-August 1946. The last of these talks was a discussion in which representatives of Business and Technical Education participated and in which there was a surprising measure of agreement. The script was subsequently circulated among several persons in different walks of life and it is very largely their encouraging reception that has led to the enlargement of those pages into the present Essay. Indeed the writer regrets that owing to forces over which he had no control, he was not able to complete this Essay as early as desired by them. He is conscious of the fact that the problems of industrial organization in India are too complex to admit of a single or one-sided solution. But he has had, perhaps not quite common, opportunities of watching them closely and is therefore emboldened to believe that one of those problems needs to be immediately tackled, and that the succeeding pages might provoke some fruitful discussion that might eventually result in the solution of that problem.

The writer would in all fairness record his appreciation of A. I. R. for having thus put a somewhat unusual theme 'over the air' and of those friends whose 'criticism' has led to the publication of these pages.

New Delhi,
15th September 1947.

M. C. MUNSHI

Introduction

One of the great problems which the titanic struggle of the second World War has raised is the distribution of man-power in the different fields of productive organization in a country. On the one hand there has been—thanks to the heavy war demands of Governments—something approaching full employment in almost all the belligerent countries; on the other, even apart from the demobilized men from the active service in the army, the question of a proper utilization and distribution of scientific man-power has been plagueing the Governments even of such countries as Great Britain and U.S.A.[1] This question may be regarded not only as one more problem of the New Education Movement, but an important indication of the great social changes of a far-reaching kind that are taking place in the national life all over the world—it may also be taken as an indication of the complexities of the issues arising out of policies of full employment and of social security.[2] It is true that the problem presents itself in different ways in different countries, having regard to the nature and intensity of economic development in each country, its educational policies in the past, the scale of war mobilization, etc. Thus for instance in Britain, owing to the fact that a generation of youth has lost five or six years of university or higher training, there is a greater shortage of scientific man-power than in other larger belligerent countries. We shall also note presently that over and above this shortage,

1. In the course of the following pages, we shall have occasion to refer to the reports of the several important Committees of enquiry which the Governments in the U.K. and U.S.A. have appointed from 1944 onwards. Here we would only refer to the speeches of Mr. Attlee and Mr. Herbert Morrison during the debates in the House of Commons on the 26th and 27th February 1946 on this very subject.

2. See "The Social Problems of Industrial Civilization" by E. Mayo (Harvard 1945).

there is a new emphasis on research in industry as well as in administrative services.

Let us now turn to the great increase in the volume of employment in our country that resulted from the heavy war demands of the Government of India and the dubious prosperity resulting from our resort to inflation. There has been perhaps for the first time—just as in many other countries—a real scarcity of all kinds of labour in India. From one point of view this feature may be welcomed, but it is surprising that, although it is now more than two years that the war has ended, few have emphasized the decline that has come about in efficiency in perhaps all departments of labour. During the war, there was a real dearth of skilled labour—and sometimes even of unskilled labour. During that period when all other considerations, except feeding the war machine, were put aside, this fall in efficiency could be overlooked—indeed in other countries too there has been a general falling-off in the output per man-hour. Now, however, no longer can we wink at this decline when the warm days of war demands and inflation are presumably coming to an end and this decline in efficiency can be neglected only at our peril as the gates of competition in the world market are being thrown more and more widely open.

We are, however, not concerned with the efficiency of labour in general or even with the distribution of labour in industry. Our examination of the problem is limited to a narrow (but perhaps important) field, namely, that of more effective utilization of the results of technological research that is made at the universities and a more fruitful employment of university talent in the field of commerce and industry. There is so much talk about industrial and technical research and about the need for greater emphasis on this, as we intensify our efforts towards industrialization. It is pointed out, for instance, that Great Britain spends 20

The Talk about Industrial Research

million pounds a year on research and industry and employs 9,000 scientists for research work. In fact the Federation of British Industries convened a conference in London on March 27 and 28 last year, at which 1,200 delegates from nine countries—Britain, Russia, Canada, Australia, New Zealand, U.S.A., Belgium, Holland and France—found an opportunity of expressing their views on the importance of scientific research. At this conference, it was emphasized that it was not enough merely to conduct research, but that it was essential that means should exist whereby the conversion of the results of the research into production should proceed as smoothly and effectively as possible. The conference passed four important resolutions on the subject of 'Industry and Research'. Two of these may well be reproduced here as they have a direct bearing on our present subject.

1. Every industrial unit should include a qualified official or officials with the specific duty of following general scientific technical developments and literature and of bringing to the immediate notice of the executive authority all matters related to the processes or products of the concern.
2. This conference places it on record that an essential factor in pursuing these aims is the provision of increased facilities in educational establishments for training scientific and technical personnel and urges industrialists to stimulate such provision in their own field of interest.

This conference also urged every industrial concern to make the greatest possible use of scientific knowledge directly it becomes available and proclaimed that research was a speculation in prosperity, that its neglect was a confession of complacency, that therefore in the next two years scientific research staff in Britain should be increased by 25 per cent and the laboratory space by

2 million sq. feet. In the U.S.A. Dr Vannevar Bush submitted a report to the President under the title *Science—the Endless Frontier,* in which he expressed much concern over the organization of scientific and industrial research by the Federal Government and indicated that the United States was contemplating steps which were taken by Great Britain some thirty years ago.

All this emphasis on industrial research and steps for its encouragement may not be misplaced. It is, however, seldom pointed out with the same emphasis that the adoption of more scientific methods of production or even any large expansion of scientific and industrial research will not of itself raise the rate of production to a level which is necessitated by our present requirements. It is essential that the means should exist by which the results of research should be converted as smoothly and effectively as possible into production or into productive processes. Even in Great Britain it is admitted that 'the contributions to fundamental scientific knowledge by workers in Great Britain have been outstanding; the application of advances in scientific knowledge to the needs and requirements of industry have all been frequently made elsewhere. The protection of these applications by patents has placed British industry at a serious disadvantage. The main reason for this state of affairs has been the lack of liaison between industrial managements, which shape industrial policy and scientific establishments.'[1] Even with a view to secure the full advantage of mechanization, it is true that this want of an effective liaison between industry and research is not equally great in other countries, but this is a problem, which is bound to come to the fore in the industrially advanced countries. If this is the state of affairs in Great Britain, one can understand what hiatus actually exists between the technical research in the universities and industrial units in other countries.

1. "Nature", May 25, 1946, p. 685.

This argument does not belittle the importance of research, but emphasizes, that even with a view to secure the full advantages of mechanization, there will be need for good management and, what is more, for the understanding and support of operatives in general.

In India the problem of the quantitative aspect of man-power and its management is certainly more acute. Indeed it is going to be an important bottleneck in our road to industrial expansion.[1] We have, no doubt, made some beginnings in industrial research and technical training and steps have already been taken in bringing business into close touch with technological training in the universities. The part played by the Bombay Mill Owners' Association in the establishment and expansion of the University Department of Technology, or the interest which industrialists have shown in similar departments at Madras, Nagpur and in the new University at Saugor is note-worthy. The Government of India only the other day announced the establishment of 4 technical institutions in different parts of the country to serve different areas.[2] It is not, however, necessary here to deal with that aspect of the problem which speaks of the collaboration between industry and research on which obviously industrial progress in the modern world depends or with the collaboration among

1. In England, for instance, it is anticipated that 1.7 per cent of the children born in 1940 would reach the University in 1960. In India the Sargent Report mentions one million children in high schools and 16,451 undergraduates in 1940-41.

2. This can only be regarded as a beginning if we compare the interest in industrial research, say, for example, in U K. today, where, too, it is said to be growing yet. In Great Britain a Committee of over 100 members of both Houses of Parliament with representatives of certain scientific and technical institutions studied the present needs of the country and made important and far-reaching recommendations to the Government for additional large expenditure in their support (Oct. 1943). The Industrial Research Committee of the F. B. I. issued a report on the same subject in that same month. The Nuffield College, Oxford, in April 1944, issued a long statement on Problems of Scientific and Industrial Research. The Chancellor of the Exchequer laid before the Parliament a White Paper describing the existing machinery for the promotion of scientific research and development. See also, "Industrial Research & Development"—Heath & Hetherington, p. 5.

industrialists on the one hand and among scientific research workers on the other. It is, however, pertinent to turn our attention to the need for co-ordination between technology and administration, between production and research, so that the great lag that exists between discovery and its adoption for commercial use can be eliminated.

Importance of Management

In the years following the first World War, greater emphasis has been placed on industrial psychology as the problems of management have come to be more and more closely studied and it is now recognized that full advantages of mechanization and industrial research involve good management as well, and what is more, that all these involve the understanding and the support of the operatives. In the debate in the House of Commons towards the end of February 1946, to which we have already referred, it was pointed out that Great Britain was faced with an acute shortage of man-power and that the attainment of even the pre-War standards of living depended not merely on efficient management, meaning thereby making the most economic use of men and women available, but still more on the energy with which these men and women went to their work. We have just referred to the recent reports on scientific and industrial research in Great Britain such as those coming from the Parliamentary and Scientific Committee or the Association of the Scientific Workers or the White Paper on Technology and Administration. All these committees and particularly the one presided over by Sir Clive Baillieu have stressed the importance of management and, as we shall presently see, these endeavours have culminated in the establishment of a Central Institute of Management in Great Britain. It is now being increasingly recognized that scientific and technical help will be required in the administrative and production side as well as in research, in order that effective use may be made of the new processes and

products which may come from research, in order that the standard of management may be raised and maintained at a high level and in order that a lively appreciation may be stimulated in the importance of effective management at all levels by all concerned. The problems of management have been looked at from various angles of vision such as (1) that of skilful and economical use of new processes and products, (2) that of eliminating social and industrial friction by an appraisal of the human factor affected by industrial advance, (3) that of improvement in industrial relations by the elimination of friction or hostility that often exists between management and men, and (4) that of the development of an effective democratic system in industry. It is for these reasons that the objects, which the Institute of Management in Great Britain is intended to serve, include provision for the study of management, the prosecution of research, the dissemination of information on the subject of management, advice on schemes of training in management, exploration of new ideas, such as the efficacy audit, and enlisting the support of all sections of the community including Trade Unions and professional bodies. The principle underlying the working of this institute seems to be rooted in the conviction that a new dynamic and less mechanical conception of industrial efficiency is now required and that there is close interlocking of social, technical and economic factors in the many industrial (and even administrative) problems that have to be faced by industry day after day. Fundamentally the problem of increased productivity is therefore one of the improved collaboration between management and labour, better training of operatives and of adequate incentives.

The Role of the Universities

In the foregoing paragraphs we have adverted to the quantitative and qualitative aspects of distribution of man-power in industry. These aspects show the need not only for raising the standard of management, but also

for the creation in industry and commerce of a continual supply of good managers. It may be made clear at the outset that when we refer to managers here, we refer to the term not in the sense of business leaders, but those higher strata of business and industrial executives, who have to take important decisions or render effective advice. Undoubtedly, the business leaders of a country are born and not made. We are, therefore, referring only to the managers of the lower rungs of the ladder for whom sound training is required and which training, universities on the one hand, and the business world on the other, can collaborate in imparting. This will also render a closer correlation between the technical education available in a country and the requirements of its industry. What can be the role of the universities or of the university-trained men in the solution of this problem of the business world? It must be emphasized in the first instance that in any industrial country—even after taking into account the growing needs of a social service State—generally speaking, commerce and industry are bound to provide for a large majority of university educated men the most fruitful channel for the employment of their talents and whether we will it or not the universities are bound to be judged by the contribution that they make towards supplying a larger and larger quota of men who would fit in with the fast growing requirements of the community. There are, therefore, two points of view from which this problem can be examined: (1) that of improving the efficiency of technical and non-technical men, the administrators and the executives, and (2) that of providing proper equipment and training for personnel management in the higher types of business administration and business research. In fact these two view-points raise a large number of problems themselves, for the first refers to the creation of those conditions in which men and women give of their best to the business unit to which they belong—the whole hier-

archy from the expert in the laboratory to the humble technician using the ordinary tools, from the executive director, making decisions of policy down to the office assistant keeping only small records—for, the problem to which we refer is not merely that of efficient management which makes the most economical use of men and women available, but to the energy with which men and women go to their work and the incentive to maintain and raise their efficiency. The second aspect refers to the training and preparation for the high task of management and business leadership. It may appear at first sight that the role of the universities is much greater in the second than in the first. It is intended, however, to point out that even in the first the university can make a greater contribution than at present towards the equipment of their graduates. In fact the first view aims at giving an intelligent graduate an insight into the scientific processes with a view to abolishing that almost complete separation of scientific knowledge from admini tration of industry (and even of the State) that has now come to exist. In our age of specialization it is rare in most countries to attempt to give an ordinary citizen an insight into scientific processes,[1] so that an ordinary graduate not taking a science degree not only comes out blissfully ignorant of even elementary principles and processes of the physical sciences, but is led to believe that it is none of his business to meddle with the 'technical side' of that huge productive apparatus of which he does become a part and yet remains so ideologically outside.

The second view lays emphasis on qualitative rather than quantitative aspect of training of business administration and business research. We propose to develop this aspect at some length in the paragraphs that follow, for in our country at any rate no systematic

1. This complete separation of these two fields of knowledge was also deplored by Prof. H. J. Laski in a lecture before the British Association of Chemists, 1945, which is published under the title, 'The Place of the Scientists in the Post-War Administration.'

attempt—beyond some elementary courses in Commerce colleges—has been made for training business administrators and business leaders. We have noted before that even in England this aspect has only recently been claiming attention, and an ambitious plan has therefore been laid for the work of the newly established British Institute of Management.[1] In order to achieve these objectives, we have to fill up the lacunae in our educational equipment and university training on the one hand and on the other to develop a wider outlook with the help of specialized institutions which would render possible a proper appreciation of the close interlocking of social, economic and technical factors. It is this inter-linking of various issues that has made the problem of management today so difficult and evasive of grasp.

While on this we may also note in passing the far-reaching social changes which are likely to result from our changed outlook on education. The educational changes which are now being contemplated are likely to increase the number of really capable men who will succeed in obtaining university education at public expense. As the process of selection by ability will greatly affect the industrial population,[2] university education must be such as to fit its graduates for the part that they will play either as technical men or as managers. It will also be conceded that the university in its widest sense will play an increasingly important part in the social life of the modern community and that therefore business will provide an opportunity for the highest form of social service to many of the ablest men in the country. Where else could the eyes of the community turn than

1. See "Nature", May 11, 1946. pp. 601-603.

2. Compare: The President of the Board of Trade, Sir Stafford Cripps, has suggested 'Working Parties'. These will not need to probe deeply into the measures required to increase the efficiency of the industries; they are investigating to discover the great importance of recruiting the right type of industrial leader. Secondly the raising of the educational standard and culture outlook of the industrial and clerical workers by itself will create a demand for higher standards of industrial leadership. "Nature", December 12, 1945, pp. 671-72.

to the university for the turning out of men who will answer these requirements and who will interpret the aspirations of the nation towards a better order of things?

We may now turn to the direction in which our university education in India is drifting. As against the craze for a general equipment in arts, which existed a few decades ago, today the pendulum has swung the other way with the emphasis on technological training. In our leading universities there is an almost ungovernable flow for the science courses. In some of our universities the proportion of the matriculates who take up the science course as against those who choose the arts curriculum is anywhere between 3:1 and 5:1. We will leave aside for the moment other problems that this great influx in the realm of technocracy will bring, for we can safely assume that they will not be as serious as they were in the past decades when the large army of 'disgruntled Arts Graduates', created a political problem for the British bureaucracy. In fact the need for science and technical graduates is so great that the present increase may not be regarded as alarming. For our purpose here, however, this great influx means that an increasingly larger and larger number of university-men will or must seek a business career. In other words leading positions in the industrial world will more and more have to be filled by men who by habit and training are strategic rather than tactical and are accustomed to verify ideas and opinions by a study of facts and results and who take the long-term rather than the short-term view of costs and benefits. *This will undoubtedly bring into greater relief the hiatus that at present exists between the university-graduate and the businessman.* On the one hand there is a widespread belief—*not merely in our country*—that the intellectual level and general equipment of men entering business is not

Craze for Technocracy

The Hiatus

so high as that of those who seek other careers; on the other hand, the businessman instinctively feels that merely spending a few years at the university and passing out of examinations are not enough for shouldering responsibilities in a field in which one must imbibe the habit of assimilating and benefitting from all that is offered, so that one can distinguish between opinion and fact. We would pointedly refer to this hiatus between the average businessman and the average university-graduate, not merely to stress the need for a better understanding as to the psychology and equipment of the university-man by the former, or the need for the latter to get into livelier and more responsible touch with the business-world, but *to plead that the results of this hiatus are great friction and frustration that can be—and must be—avoided if industry is to benefit by the service of minds competent to appraise human factors in a situation and quick to appreciate the possibilities of technical innovation.*

It is true that on this question strong views are held by both sides and very often the general background of our universities is blamed for creating a feeling in the minds of youngmen that education ends with the university instead of really commencing at that stage, and that in general university-training does not develop a sense of initiative in youngmen. It will serve no purpose at this stage to open this question in full. Instead of referring to this conflict we would only emphasize the need for bridging the gulf by suitable methods. A greater collaboration can be achieved by a closer study of the problems of management and by bringing the university-training more and more closely in touch with the requirements of business. This question of bridging the gulf has undoubtedly assumed great significance in this generation of 'managerial revolution' and as we have seen before the great emphasis that is now being placed on the problem of management in Great Britain and U. S. A. is symptomatic of this signi-

ficance. This question, however, opens out larger issues with which we are not directly concerned here. It will suffice for our purpose if we bear in mind the need for eliminating this hiatus and if we formulate this plea in a two-fold plan of organizing training for business management, viz. (1) an effective co-ordination between the non-technical administrator or executive and the scientific worker or technician, and (2) a systematic investigation of the general problems of business administration and business research.

The three questions

Before, however, we formulate this plan, it would be pertinent to raise three questions of a general nature which would emerge from this discussion.

1. What is the training which the university-man will need for successfully pursuing his work in the business world?

2. What has been the use made of university-men in business? and

3. What can the businessman, by himself, or in concert, do for the better preparation of university-men entering business?

We must at the outset frankly realize that the kind of university-man who will make a success in the business world is neither he who is, by temperament or equipment, scholarly—who, in other words, would pursue knowledge only for its light-bearing qualities, ignoring its fruit-bearing results; nor will it be he who takes university life rather lightly and who loses himself in the social activities of the university. In a generality of cases, this successful man will belong to that type who imbibes the habits and training that make for the development of the whole personality. If the university-man in general does not possess the character and mental ability to do this, he should rather go straight from school into business. The failure on the part of such men who do not profit by this all-round training in the university has very often been respon-

sible for the indifference—if not contempt—of the employers. More than this negative emphasis, it would be difficult to say in general terms, beyond stressing the need for bringing the universities more closely to satisfy national needs. In India no efforts have yet been made either by the Provincial or Central Governments to control and guide university education on these lines, but as we have seen ere long this attitude will have to be given up.[1] When we turn to the question of actual uses in business to which university-trained men have been put, we would find it somewhat difficult to generalize in the absence of precise data, but a very general impression prevails that business has not been recruiting so high a proportion of the intellectually ablest university-men as other occupations do. Perhaps the only authentic data we can obtain is about the sugar industry where 3,000 science graduates are estimated to be regularly employed. The impression above referred to is not to be accounted for by adequacy or inadequacy of the remuneration paid, but by a feeling that there is a lack of opportunity and a denial of that responsibility which is regarded by them as more valuable than lucre. This impression has largely been supported by the report of a Committee which was recently appointed by the Cambridge University Appointments' Board.[2]

The Discontent and its Remedy

1. In this connexion it is useful to compare the extended terms of reference of the University Grants Committee as announced in the House of Commons in July 1940, viz. 'to collect, examine and make available information on matters relating to University education at home and abroad; and to assist in consultation with the Universities and other bodies concerned the preparation and execution of such plans for the development of the Universities as may from time to time be required in order to ensure that they are fully adequate to national needs.' (See "Nature", Sept. 21, 1946.)

2. Inadequate remuneration is not often mentioned in the graduates' letters, but want of opportunity and lack of responsibility are constantly referred to as frustrating the usefulness of university-men in business. Some graduates complain that firms when recruiting university-men hold out prospects of positions of responsibility and that after a time it becomes clear that there is little likelihood of these prospects materializing. Such a practice must destroy the university-men's confidence and have the effect of making the best men enter other

In fact this discontent is not confined only to the men of the highest rank but is carried down to the lower rungs of the ladder as well. Here it is largely to be accounted for by the treatment and method of training new recruits that is generally adopted in business houses. This method may be generally described as 'the sink or swim method' which ignores the fact that the graduate differs in his mental attitude from the school-boy. The former has three or four years' education of a kind which differs radically from that of the school because this education is meant not only to develop his critical faculties but to impart knowledge to him in new fields in which a high standard has been set. These cumulatively must modify his attitude to learning and demand a more thorough approach than would satisfy less-formed minds. This does not mean that the graduate should receive preferential treatment, but that the graduate and school-boy must be given training in ways that are adapted to the different stages of their mental development when entering business and that the graduate would be most effectively trained, in business methods, if his training is a natural sequence to his university education. Thus, for instance, numerous instructions that are given to him would be meaningless unless he understands the principles of their interaction. Once he understands these, the facts will be fitted into a co-ordinated whole and will become a part of his mental habit, not because he has memorized them but because they are the essential symbols of his thought.[1] The focus of attention will lead to the emer-

employment so that business will only be able to recruit from the less able graduates. This is the result to be avoided. (Report, pp. 7 & 8).

1. 'Special stress is laid upon the value of sympathetic sponsorship of a proper senior member of the staff in helping the young graduate to appreciate the purpose and the method of his training, stimulate or curb ardour as occasion requires and ensure that he gets a fair deal at the hands of the executives under whom he will be working during his tour of departments. Such handling will also encourage that feeling of loyalty which firms often say is one of the best features of university-men in business and which is one of the most valuable gifts a man can offer to the institution.' (See "Nature", December 8, 1945, p. 673.)

gence of new facts relevant to a situation and it is this capacity to discover new facts and relate them to general principles that gives birth to new ideas which are the main assets of the best type of university-men in business. This again does not mean that the capable and promising school-boy should be handicapped as against a graduate in his progress. In fact, it is very desirable that business firms should adopt a practice of providing full-time university courses for the occasional school-boy who shows real promise and capacity to benefit fully from higher education. Such boys are very often found on the technical side and they should normally be afforded ample opportunities for at least taking part-time courses at universities or technical institutions.

It is also desirable in order that the other complaint about the lack of opportunity, etc., may be removed, that high administrative posts should be offered to men with scientific training particularly in manufacturing firms. At any rate the technical man should not be made to feel that even in the higher fields he is only a tool in the hands of the financier or the organizer. There is one more consideration which links together the first two questions, that we have raised. It is well known that there is at present too much of purposeless drifting into business careers, that a large number of persons take to business not so much out of choice as of compulsion. While some of this drifting is unavoidable much waste could be eliminated if competent advice is given to an undergraduate in the light of his qualities and capacities as to the career he can hope to embark upon at his own free will and how best he can do so.

University Appointments' Boards

One of these ways to which we shall presently refer is to bring the commerce and technical courses of universities more and more in accord with requirements of business by a recognition that their aim is to increase the standard of business administration and business leadership and by a realization that industry in its widest

sense plays a very important part in the modern world and further that business provides an opportunity for the highest form of social service for many of the ablest men in the community. For this purpose, the universities must be assisted in bringing their commerce degree curricula as much in line with the requirements in business as possible. Thus while on the one hand universities may be assisted in improving their curricula, on the other hand there is also the need for the establishment of University Appointments' Boards, such as are, for instance, developed at some British Universities. These Boards can render extremely useful service firstly by tendering general information and advice to undergraduates not necessarily for making an early decision in their careers. Their advice should awaken the prospective entrants into business careers to the difficulties and complexities of the tasks ahead, and thus succeed even at the initial stage in preventing square pegs from going into round holes. Secondly, these Boards will in time be able to render valuable service both to the university-men and the business houses in finding out proper employment for young graduates.

In dealing with the third question, we are concerned with the positive suggestions for the preparation of university-men for business and with our emphasis on establishing some useful links between technicians and executives. We have already deplored the paucity of opportunities to an ordinary citizen in our age of specialization (in which there seems to be a wide-spread refusal to interpret science to the common man) for obtaining an insight into scientific processes. In business this has created a barrier between the technician and the administrator, and what is more, it has prevented co-ordination of efforts of both to the common advantage of all. We very often hear the complaint of managers and employers that the university-man entering business is unduly ignorant of the subject matter of his occupation.

Technician Vs Administrator— A Link

It is here that the business units themselves can increase the efficiency of their employees by affording facilities to the executive staff to obtain an insight into the technical processes of their industrial establishment and by co-operating with the training institutes to which we shall presently turn. There is thus, in the first instance, a good deal to be said for voluntary courses for arts and commerce students, as well as science students entering business, to be afforded an opportunity for obtaining the requisite complement to their knowledge which will be of use to them in their professional careers. Indeed to a large extent this principle has been accepted by the technological institutes both here and abroad wherein engineering and other science students are given a course of training in industrial management in order that they might be successful managers as well as technicians. The recent Reports of the Committees appointed in Great Britain, to which we have referred above, make a pointed reference to this and indicate that the experience of the last war has shown that the greatest deficiency in British industry is the shortage of scientific men and technologists who can also administer and organize and apply the results of research and development.[1] It is, therefore, necessary that university departments of technology and other technical institutes should co-operate with business houses in filling up this lacuna, and for strengthening their links with the world of business and industry. As for the training of the non-technical men the institutes for business administration and business management, to which we shall presently refer, must endeavour to seek help and guidance from departments of technology as well as business houses.

1. Particularly the report of the Sub-Committee appointed in April 1944 under the Chairmanship of Lord Eustace Percy to advise on the needs of higher technological education in England and Wales, published in 1945.

II

It is against the background of these problems that we raise the issue of management training. In the West, education in management has made headway as part of the larger question of personnel management and indeed this latter subject has of late been receiving increasing attention. The rise of this movement is generally associated with the name of F. W. Taylor, an American Engineer. Taylor defined management as the art of 'knowing exactly what you want them to do and then seeing that they do it in the cheapest way' and he emphasized three things: (1) Research and Experiment, (2) Stabilizing conditions by standardizing, and (3) Control of methods to common end. As we shall presently see both the connotation and the denotation of the term can now be extended and the training in management, we suggest, should also have as its aim, the elimination of the hiatus which we have emphasized above. It would then be useful if we paused a little to examine briefly the development of education for management and the main problems that have been brought into relief during this process. It would be enough for our purpose if we study the contrast between the British and American system at some length and indicate the trends that educational policy has now taken in some leading countries of the world.

Training for Management and Business Administration

More than in any other country in the United States of America professional education is largely a function of the university. Undoubtedly there are many individual, tax-supported colleges as also other privately-operated, but by far the largest number of those engaged in the professions receive their professional education in the university. It would, therefore, be of interest to examine in some detail the principles on which these institutions are founded and the content of vocational education which

U. S. A.

they impart. There is perhaps no country in which since the beginning of this century such great emphasis has been laid on business administration and business research. In fact this lead, thus given by the United States, has now been followed—as we shall presently see—by other countries as well. It has now come to be realized, at any rate all over the West, that business management is the secret of business efficiency. Even before the last war, this realization was exemplified in the International Management Congress, which held its last session in Washington in 1938. This year (1947) too, this International Management Congress met at Stockholm (in July) in order to review the progress of business management during the last nine years. Two hundred representatives were sent by Great Britain alone and her participation was organized by the British Management Council comprising the United Kingdom's leading trade and industrial associations. We have already referred to the formation of the British Institute of Management which supersedes the Business Management Council and we shall presently indicate the trends of thought and policy in Britain on this subject. But it is also pertinent to note that the Australian Institute of Industrial Management too was represented by five nominees at the aforesaid Stockholm conference.

There is indeed a social significance that can now be discovered behind such institutes of management as have grown up in America. Mr. Alwin E. Dodd, President of the American Management Association has been reported to have observed at the Stockholm Congress: 'This idea of a sense of social responsibility on the part of modern American Business may be hard for some Europeans to grasp, judging from the European comments and the declarations made at recent international economic meetings. They appear to have difficulty in understanding the American concept of profit motive as a spark plug and incentive for maximum pro-

duction and employment, the latter of which in June 1947 reached the all-time peak of 60 million employed."[1] It would appear that ideas of democratic capitalism in the United States brought about a situation in which all American business came to be regarded as a social institution with social responsibilities. The American generally likes to take pride in the fact that it is such an outlook that has enabled the nation to reach new heights during the last war when the United States with 7 per cent of the world's population produced 40 per cent of the world's goods and that this great productivity which made this possible was built up over many years before the war.[2]

Let us, therefore, briefly survey the growth of such institutes of business administration in the United States and the work which they have increasingly undertaken during the past 40 or 50 years. In the first instance the social undercurrents of growth of such institutions can be found in the changing character of business enterprise towards the latter part of the nineteenth century and the early part of the present century. During this period business enterprise became larger and more complex and specialization developed the various functions of business management with increased administrative responsibility. The business leaders more and more developed a professional attitude

1. "Economic Review, American Newsfile", June 27, 1947. Incidentally this figure of 60 million employed was believed to be an impossibility only a few years ago.

2. In the mid-year Review of the Economic Progress, President Truman with justifiable pride observed inter alia:

(a) In June we reached a record level of 60 million civilian jobs.
(b) Farm income has attained a record level.
(c) Business investment and equipment has reached even the record heights of last year.
(d) With a slight reduction in the work-week productivity has increased.
(e) Our standard of living is exceptionally high and purchasing power thus far has been adequate to absorb completely the enormous production of American firms, mines and factories.

—a realization of the existence of economic forces and of the need for expansion of research and scientific methods of administration. It is in this environment that early collegiate schools of business found their *raison d'etre.* In the decades that followed, increased participation of Government in the supervision and regulation of business, the susceptibility of American business in international affairs, the growing emphasis on the complexities of human relations and their bearing on industrial efficiency, the increased competitive struggle and the trend towards narrower profits gave new opportunities to collegiate schools of business for training men for the ever growing managerial responsibilities and thus for contributing to the general welfare. Beginning with the Dalton School of Finance and Commerce at the University of Pennsylvania in 1881, the New York University in 1900, Harvard in 1908, there are at least 100 other formally organized versions of business management in the American colleges and universities that have grown up during the last three or four decades. In June 1896 the American Association of Collegiate Schools of Business was organized at a conference of representatives from 16 collegiate schools of business. This organization is now composed of 53 institutions and their programmes of instruction in business subjects have achieved the standards established by the Association.[1]

In 1917 the Smith-Hughes Vocational Education Act was passed as a result of which the High Schools began a rapid development not only of vocational education and agriculture, trades and industries, homes economics and commerce, but also of other courses which were called for by the needs of the community. From this time there started two movements, one to broaden the base of the College and the other to broaden

1. For details see 'American Universities and College Handbook of Higher Education of the American Council of Education,' 4th edition 1940, pp. 103-105.

the base of the High School. The colleges and universities have progressively become widely vocationalized on the professional school level, though they have not made adequate adjustments to serve those young people and adults who graduate from High Schools and want vocational education for the scores of occupations of less-than-professional grade.[1]

Professional persons have actually doubled in numbers and have increased their proportion of the total number of workers by one-half in the period 1910-40. Proprietors, managers, and officials have increased by approximately one-eighth in numbers, but have decreased relatively in proportion to the other categories.[2]

Much more apposite than the foregoing history would be a survey of the general nature and the content of these educational programmes. The objectives of these institutions are typified in the charters of such institutes as the Rochester Institute of Technology which 'provides general education and technical training for the living of a satisfying life and the earning of a respectable living, not as two processes, but as one, closely integrated so that graduates may successfully take their places in the community as contributing citizens' or the Los Angeles City College where the terminal curri-

1. 'From the building of the Pyramids down to the present day, the proportion of the world's work of the nature of mere physical digging, pushing, carrying, and hammering, by the exertion of muscular force, has almost continuously diminished. From the cutting of the canal at Corinth to the cutting of that at Panama, the share of the thinker, the architect, the designer, the draftsman, the engineer, the toolmaker, the accountant, and the clerk, in every productive enterprise has become steadily larger; and the proportion of workers so engaged has grown accordingly.' "Whither Mankind?"—by C. A. Beard, Ch. V; "On Labour", by S. & B. Webb, p. 140 (Longmans 1928.)

'The need for vocational education of college grade is indicated by numerous trends in our national life. Some of these trends are conditioned by the changing structure of our economic life, others grow out of the larger social pattern, while still others are shaped by our scheme of education. It is difficult to determine which of the factors involved in these trends is cause and which is effect.' (Federal Security Agency, U. S. Office of Education, Vocational Education of College Grade, Bulletin 18, p. 9.)

2. ibid., Table 5 on p. 14.

cula and courses 'are designed to develop competency in the practical knowledge, the principles of practice and the general nature of the occupational field of the student's choice' so that he is also provided with 'a workable and salable skill in this occupational area which will enable him to enter and hold a position with capacity for improvement and promotion'. The development of vocational educational programmes in colleges and universities represents an evolution of the point of view that higher education should serve the needs of all citizens who can profit thereby.

Vocational Education of the college grade and its programmes may be classified under three general groups:

1. Technical institute type programmes,
2. Junior college terminal programmes, and
3. Programmes of degree-granting institutions.

1. Technical Institutes

A recent survey of these institutes (conducted in 1945) included the names of 76 of these schools, and grouped as follows:

State maritime academies and Federal Schools—10
State and municipal technical institutes —14
Privately endowed technical institutes —18
Proprietary Technical Institutes —34

A total day enrolment of 10,538 students and a total evening enrolment of 8,337 students were reported by 43 of these institutions in 1944-45.[1] These technical institutes serve persons who wish to prepare intensively in one, two or three years for vocations and job services, which demand more preparation than that which is required of skilled craftsmen and less than that required of graduate engineers or agriculturalists. These schools prepare chiefly for technical, supervisory, or managerial

1. A pioneer investigation of this type of education was first made in 1931 and this report was published under the title 'A Study of Technical Institutes' by the Society for the Promotion of Engineering Education. Statements concerning the total number of technical institutes vary in accordance with the definitions used. Thus another tentative list prepared for private use named as many as 247 technical institutes.

services and also serve the needs of adults already in service in respect of their further training. A very large part of their instruction is direct and practical and is based on the usages of industry and related occupations. Their aim is to prepare individuals for specific technical positions or lines of activity rather than for broad sectors of engineering. Most of the technical institutes are located in the highly industrialized areas of the State, especially in the Northerly States, east of the Mississippi River and in the Pacific Coast States.

2. Junior Colleges

Though this term was used as early as 1896, the national organization of these institutions--the American Association of Junior Colleges—was established in 1920. The junior colleges offer several kinds of curricula, such as (1) those aimed at covering the freshman and 'sophomore' years of 4-year curricula for students who would later transfer to other institutions where they may continue their study for degrees, (2) pre-professional curricula to enable the students to enter professional schools, (3) terminal curricula for serving the needs of students, who do not intend to pursue more advanced study, (4) curricula to serve returning veterans and others with maturity and experience who need service in overcoming any educational deficiency for advanced vocational training, and (5) curricula to provide vocational education of college grade for day-time employed adults especially during evening hours.

The American Association of Junior Colleges lists as many as 584 junior colleges in its Directory published in 1945. These institutions are widespread and are found in all States, California and Texas having 71 and 48 respectively. According to the U.S. Office of Education Biennial Survey of Education, 1940-42, junior colleges which supplied data had increased in number from 52 in 1919-20, with an enrolment of 8,102 to 461 in 1941-42 with an enrolment of 141,272.

Colleges and universities, which grant degrees,

offer vocational education of college grade under various administrative arrangements. In some institutions the work is carried on in the 'lower division'. In other cases the programmes are under the control of the extension division and are offered both as 'on-campus' and as 'off-campus' work.

3. Colleges and Universities

While colleges and universities in every State offer class extension courses, State Universities and institutions of higher education in large cities are especially active in such work. Courses or curricula are often organized on the basis of specific needs of business, industry, or agriculture, or of groups of students with specific needs, and are more practical and direct in methods of instruction than the usual courses leading to degrees in the same fields. Many students take extension courses which carry credit certificates towards degrees. The number of persons served by higher education institutions through class extension activities is indicated by the fact that in 1939-40, 214,027 men and women were enrolled in the classes of college grade and 54,841 in classes of sub-college grade.[1]

Sometimes a number of Colleges and Universities co-operate with other institutions and agencies in their vocational offerings, such as for instance in the North-east Junior College of Louisiana State University, where the shop work for the technical courses is taught by the Ouachita Valley Vocational School, or at the Wayne University, where a curriculum in banking is offered in co-operation with the American Institute of Banking or Industrial training sponsored jointly by the University and the Chrysler Corporation. These programmes obviously are based on continual analysis of the demands for workers in the major occupational fields and as occupations form a continuous series from the unskilled to the professional, these institutions providing training must be closely co-ordinated. Thus for instance, the

Some Notable Features of their Programmes

1. Vocational Education, ibid., p. 38.

programme of vocational education operated under the Smith-Hughes and George-Deen Acts was set up to provide mainly skilled operatives. It carries on under the limitation of being of 'less than college grade'. The essential feature of its administrative machinery is a State Board created or designated in each State with authority to administer the programme.

We may now examine a little more closely some representative programmes of business administration in order the better to appreciate the content of such training and the characteristics of the programmes which the American Universities have developed.

Western Reserve University, Cleveland, Ohio.

Cleveland College Vocational Education Programmes: The College has established a wide variety of vocational terminal programmes which include:

1. Public accounting,
2. Industrial accounting,
3. Retail merchandising,
4. Organization and operation of small business,
5. Life insurance underwriting,
6. Advertising and market research,
7. Secretarial training.

These programmes are different in nature and content to meet the vocational needs of a wide variety of individuals, such as a purchasing agent, salesman, retailer, commercial artist, inferior decorator, personnel worker, business research assistant, translator, radio broadcaster, and insurance agent. The courses are so adjusted as to lead to specialization in the different fields for (1) college students who expect to enter the employ of local and other metropolitan department stores and chain organizations; (2) college students who expect to establish their own small stores or to be employed in smaller stores in executive capacities; (3) retail stores which desire to train selected future executive material

while still in school to meet future needs; (4) department stores and chain organizations which wish to upgrade promotional material selected from present personnel; (5) college students who later may want to complete the requirements for the degree of bachelor of business administration.

Five types of courses and training are provided: (1) General business courses designed to acquaint the student with problems and procedures of all business, including both manufacture and distribution; (2) orientation courses in merchandising to acquaint the student with the functions of retailing, store organization and inter-departmental relations; (3) merchandising methods courses to train the student in the accepted procedures of modern retailing as applied to various kinds of merchandise; (4) merchandise information courses covering the basic materials with personalized training for individuals to meet part-time job requirements; and (5) job functional training, including salesmanship, executive techniques, advertising problems, personnel administration, and other courses as required.

The Personnel Research Institute, well-known in the industrial personnel field, has already extended its activities into retailing, and has recently planned a research programme for a leading local store. This work co-ordinated with their training programme offers Cleveland College an unusual opportunity to be of service, particularly with respect to post-war adjustments. The results of the Institute's research will be of particular value in determining the exact content of courses in the merchandising curriculum.

Two-Year Programme in Business Administration

The two-year curriculum (60 hours, 2 years full-time) in business administration leads to a certificate with specialization in subjects or courses applicable to the retail field.

A one-year Training Plan with or without college credit, totalling 30 hours, or a 30-hours certificate, is

One-Year Programme in Business Administration

offered under store sponsorship and University approval.

In the year 1945 the American Council on Education, (Washington, D.C.) published a very useful *Guide to Colleges, Universities and Professional Schools in the United States.* Its first part deals with Junior Colleges, Colleges of Arts and Science, Colleges and normal Schools including such other college units as Basic General Colleges, Junior Divisions and Colleges of Science, while part two is devoted to professional Schools.

There are several universities which are well known for their schools of business administration; perhaps the best known of these is the Graduate School of Business Administration, of the Harvard University. The aim of the school is to train youngmen for positions of responsibility in private business or in the business of government. The Harvard School of Business Administration was founded in 1908. The University authorities believed that the elements of business administration could be defined and taught better, more quickly, and to higher social purpose by such a school than by the traditional apprenticeship in business or the dogmatic course in business routines then offered by a variety of institutions. The growing complexity of business and the trend toward larger business units had made it difficult for an apprentice to learn the whole of any process or to see clearly the relationship of his work to the other functions of an enterprise. Another change of significance was the increasing number of college graduates seeking careers in business rather than in the older professions.

University and College Schools of Business Administration

The School undertook to give college graduates an opportunity to study business problems and principles under adequate guidance and with minimum emphasis upon routines.

The regular programme of the School leads to the

degree of M.B.A. upon satisfactory completion of four terms' work. As stated by the Faculty, these include, ability to analyse business situations, recognise problems and determine issues, seek pertinent facts, develop alternatives, and reach reasoned decisions; ability to organize, ability in oral and written communication, ability to deal with people; ability to train subordinates; ability to use figures effectively for administrative purposes, ability to establish standards and to control and judge performance, ability to execute effectively selected operating tasks, including those involving severe time pressures; considerable knowledge of business techniques in one or more areas, acquaintance with sources of business information; understanding of the general framework of business relationships, functional and institutional; understanding of the useful generalizations of political economy and ability to develop at least the beginnings of an integrated social and economic philosophy; understanding of ethical considerations as an integral part of business administration and ability to develop an integrated set of ethical concepts for personal guidance in administration, a spirit of vigorous and courageous enterprise.

Under normal conditions, a man must hold at least a Bachelor's degree to be eligible to apply for admission to candidacy for the M.B.A. degree.

All first-year subjects contribute to one another, to the first-year course as a whole, and to the work of the second year, but primary emphasis is on one closely integrated programme of training in the fundamentals of administration. Each of the subjects is dealt with from a managerial point of view. This course is divided into six subjects: Production, Marketing, Finance, Control, Administrative Practices, and Public Relationships and Responsibilities.

The second year has a three-fold function. Definite specialized knowledge and skill are of real importance in helping the graduate make a successful beginning in

his business career; the second year provides for definite specialization in some particular field of business activity. The functions of the second year result in a curriculum which provides for concentration, distribution and integration in the student's programme of study. In the third and fourth terms, students are normally required to take a total of 11 one-term courses, six courses in the third term and five courses in the fourth term. There is also a two-term basic programme for veterans. Some veterans may wish professional education for business, but because of financial or family obligations, be unable to look forward to the 16 months necessary for the M.B.A. programme. For these men the School has provided a two-term (eight months) programme which essentially consists of the Elements of Administration. There is also a one-term reorientation programme, for a limited number of veterans and for graduates of the Harvard Business School, without the necessary experience and after a break resulting from, say, service in the army. For such courses several companies depute their men and they are described as key-men for the posts.

Doctor of Commercial Science

The work for the degree of Doctor of Commercial Science at the Harvard Business School is planned not only for men who have done their Master's work at the School, but also for men who have done their Master's work at other institutions. This degree is granted in recognition of the need for advanced training of men who are preparing for research and teaching, for positions with Governmental units which closely concern business, and for certain types of specialized business positions. This course is specially designed to (1) develop a comprehensive grasp of administrative problems, (2) secure mastery of several broad areas in business and related subjects, (3) achieve command of a specific field, (4) perform research of an original and constructive nature, and (5) present effectively the

results of such research.

Division of Research

The School of Business Administration has a division of Research which has two objectives: The first is to provide the essential realistic material on which to base its teaching programme; the second is to contribute to the economic and social well-being of the country by analysing and clarifying problems of business administration, problems common to particular industries and problems of inter-relations between government and industry.

The research activities of the School are of two types: individual and organized. Individual research is carried on by individual Faculty members with funds, if any are needed, secured by their own efforts. Organized research under the division of Research falls into two categories, case research and special projects. Research in both these categories is financed by allocations from funds contributed by the Associates of the Harvard Business School and by gifts from corporations, trade associations and individuals. The organized preparation of cases began in 1920 and since that time, the School has obtained approximately 18,000 cases.

Special research projects cover such diverse fields of interest as airport management and financing, operating costs of department stores, history of a cotton manufacturing company, functions and duties of corporated directors, taxation of growing enterprises, human aspects of air transport design and operation, the use of newspapers as advertising media, and fuel oil distribution. Since 1942 a considerable amount of research has been conducted for the Army, the Navy and Government agencies, most of which remained confidential for the duration of the war.

The Bureau of Business Research, established shortly after the founding of the School, has published in all more than 120 bulletins, mostly concerned with the operating expenses of retail and wholesale business.

The Bureau also conducts a Fatigue Laboratory, founded by Rockfeller Foundation. This Laboratory is equipped with adequate apparatus for work in physiology and biological chemistry, as well as with facilities for studies of all kinds of climatic conditions.

The foregoing sketch of the various institutions providing education for management in the U.S.A. is intended not so much to detail the facilities available as to indicate the contrast that exists between Great Britain and the U.S.A. It was more than 22 years ago (in 1924) that the Balfour Committee on Industry and Trade observed that there were 80,000 students attending 100 schools or departments of business administration or commerce—'a figure out of all proportion to the few hundreds to be found taking similar courses in this country',[1] a reflection which is almost repeated by the Urwick Committee on Education for Management which reported last year: 'there is an almost complete lack of courses provi ling full time training for the man who proposes to teach management as a career after he has acquired the necessary practical experience.' This lead given by the United States is also emphasized by the Percy Committee on Higher Technological Education, which reported in 1944. In fact they recommended that 'at least one institution should be selected as a centre for post-graduate study of industrial administration. It should be the function of this centre to set standards in the teaching of subjects, to systematize it as a mental discipline, to conduct the necessary research, to develop the literature on the subject and to train teachers of it.'[2]

But before we turn to Great Britain in order to view this contrast let us emphasize that the American outlook has been in no small measure responsible for practical co-operation between business schools and local industries to an extent that is not found in any

1. Factors in Industrial and Commercial Efficiency, Committee on Industry & Trade, p. 261.

2. Report of the Special Committee on Higher Technological Education, p. 23.

other country. Further it was this outlook which made even the part-time courses improvised by the Office of Education at Washington under the Engineering Science and Management of War Training Programme so notably successful. In the month of December 1943 alone the number of students enrolled for management courses was 51,500 and the Urwick Committee has estimated that in 1943-44 at least 200,000 students were taking courses in management subjects.[1]

When the Harvard School of Business Administration completes its post-war reorganization it will have an annual output of 800 graduates, a figure which alone is more than ten times the annual output in Great Britain of men with a university training in management.

Great Britain

We have already seen that Great Britain has lately awakened to the need for education in management and has accepted the lead of the United States in this matter. If, therefore, we revert to the Balfour Committee's observations in 1924 (referred to in a foregoing paragraph already), it is only to show that the lapse of 22 years has yet made little difference in the relative positions of the two countries in this matter.[2] It is true that full-time courses have been held by the Department of Industrial Administration at the Manchester College of Technology, by the School of Economics at Dundee and by the Department of Business Administration at the London School of Economics. Still, however, this contrast between the two countries persists and is largely explained by the difference in the outlook on the part of the universities as well as industry in the two countries. In fact, there is even now in Great Britain a lack of statistical

1. See ibid., para 56. The Committee adds, 'we should be surprised to learn that the actual number of students in Great Britain was even a twentieth of that figure.'

2. 'While there has been some difference in Great Britain, the result has been a trickle compared to thousands of young men poured out annually in the U.S.A. with some intellectual preparations for and an established "concern" with management technique.' (The Urwick Committee Report, Appendix D).

information illustrating the national facilities available for education in management.[1]

This does not, however, mean that facilities for business training have altogether been neglected in England. As against the U.S.A., England has justly been proud of her technological institutes and her system of *part-time* education, which is built up round the technical colleges. What is notable, on the other hand, is that so far this training in management has been regarded as ancillary to technical education and that there has been a general reluctance to develop the subject of management as a broad intellectual discipline in itself. Thus even before the war, some technical and commercial colleges in Britain were finding it difficult to provide classes for the varying requirements of professional bodies for instructing students in management subjects. The number of such professional bodies, whose students are required to study management subjects has undoubtedly grown during the recent years.[2] In these paragraphs then, let us attempt not only to indicate how this emphasis on the study of management has developed (and led to the establishment of the British Institute of Management), but also to describe the background in which the problem has received its prominence. For the past few years Great Britain has been systematically attacking the larger problem of educational reconstruction together with that of the distribution of scientific man-power. Great Britain has in fact now to face a three-fold problem: (1) A National Plan for Education, (2) quantitative shortage of man-power in industry in general, and (3) the problem of industrial research and scientific management. While it is only the last one with which we are primarily concerned, we would note in passing that a national scheme of educational reconstruction was mooted as early as in the Education Act

1. This point was stressed by the Urwick Committee as late as 1946.
2. See the Ministry of Education Secretary's Foreword to the Urwick Committee Report.

of 1944. In February 1946, the Ministry of Education accepted the view "that the organization of 'further education' must be on a regional basis if all the needs of the commercial and industrial personnel are to be covered adequately." More recently in April this year (1947), the same Ministry issued a suggestive pamphlet under the title *Further Education,* designed to survey the whole field of further education. This plan contemplates not only technical and commercial education as part thereof, but views education as embracing both skill and social leadership. It is not enough if men and women possess technical education in order to answer the highly specialized demands of industry and commerce today; these men and women must also develop an understanding of human relationships which alone can equip them for social leadership.[1] Industry today is a large-scale organization and success in it will depend upon the qualities of personalities no less than upon the acquired knowledge.

2. *Quantitative shortage of man-power in industry*: It is now well-known that this shortage has proved a bottleneck to Britain's recovery. We shall, therefore, refer only to the Economic Survey published by the British Government in the beginning of 1946 and to the illuminating debates which took place in February 1946 in the House of Commons and in May 1947 in the House of Lords. The Economic Survey published in the beginning of 1946 said that the Government were at the same time modest and ruthless about the

1. The Percy Committee on Higher Technological Education making its concluding recommendations observed: 'The chief of these is the question of training in what may be called management studies. We have been impressed by the statement made by several of our witnesses that the highly trained technician is often ignorant of the principles of industrial organization and management and that he "often shows no inclination to accept administrative responsibility". Admittedly there is a body of knowledge, awareness of which may merely facilitate the process of learning. This body of knowledge should be made available both at the "undergraduate and at post-graduate study".' (Paragraph 71). With this recommendation the Urwick Committee obviously concurred (Paragraph 6).

See also "Nature", January 5, 1946, p. 2.

distribution of man-power and that they had for the time being emphasized five fields in which they would specially consider this distribution, viz., (1) Coal, (2) Agriculture, (3) Textile and Clothing, (4) Metal and Engineering, and (5) Public Services. But this shortage of man-power has also been felt perhaps most acutely in the ranks of Business Managers, Administrators, Scientists, Teachers, Architects and Doctors and it is no wonder, therefore, that the problems of University Education have been the subject of investigation and discussion by a number of committees and conferences.[1] While we are not concerned with the general problems, of the expansion of universities,[2] it is pertinent to refer to the resolution recommended by the Council of British Associations to the University Grants Committee, which suggested: (1) making extensive effectual surveys of the openings for graduates in the national life, (2) maintaining records of the careers of the university graduates and measuring of their success in their professions, and (3) publishing periodic reports on the results of such surveys for the guidance of universities and schools.

3. It is, however, on the third problem, that of *Industrial Research and Scientific Management,* on which we may dilate a little. It will be seen that on the one hand Great Britain is laying down ambitious schemes of scientific and industrial research, but at the same time, she is also coming to realize that there is an equally urgent need for the very careful handling of her existing reserves of scientific man-power. We shall, therefore, very briefly indicate how Britain is almost

1. e.g., (a) Percy Committee on Higher Technological Education, (b) Barlow Committee on Scientific Man-power, (c) Baillieu Committee on Management Institute, (d) Urwick Committee on Education and Management, (e) University Grants Committee, (f) The Committee of Vice-Chancellors and Principals, (g) The Conference on the subject of May 10, 1947, at the University of Manchester, and (h) Committee on Scientific Man-power.

2. Reference must, however, be made to a series of articles in the "Economist" in February, 1946 and to Sir E. Simon's articles in the "Political Quarterly", December, 1944.

vying with the United States in her programme of scientific and industrial research and then proceed to show how she proposes to co-ordinate this expansion of scientific and technical personnel with the requirements of industrial leadership. We have already referred to the increase which the University Grants Committee has sanctioned to the universities, viz., to £20 million as compared to 2 to 4 million pounds before the war. Every effort is being made to stress that the use of science in industry is essential for the survival of the country.[1] But even before the war, while the great contribution of industrial research to the industries in Britain was pointed out—and quite frequently with justifiable pride—it was realized that this kind of technological research was not enough. The war-time experience placed increasing emphasis on the human and social side, for it was by securing complete man-to-man understanding between employers and employed, between managements and trade unions that Britain built up her industrial war potential.[2] This factor has been forcibly brought out by the Percy Committee which said that (1) the position of Great Britain, as a leading industrial nation, was being endangered by the failure to secure the fullest possible application of science to industry, and that (2) this failure was partly due to deficiencies in courses of education and training. They added,

1. Quite recently the "Board of Trade Journal" has begun to publish articles under the caption 'How Science Can Help Industry' as an information service to Industry. 'In fact this divorce between science and industry cost us dearly in the first World War and might have well led to our losing it. It was this realization that led the Government of the day to take steps to bring science and industry closer together. This led to the formation in 1916 of the Department of Scientific and Industrial Research, especially charged with the task of encouraging the habitual application of science in industry.' (Sir Edward Appleton, "Board of Trade Journal", 31st May, 1947).

2. For it was by securing complete man-to-man understanding between employers and employed, between management and trade unions, that Britain's factories built up that astonishing team spirit, animating everyone from the highest executive to the lowest benchhand. (Viscount Leverhume on 'Secrets of Business Efficiency—Britain's Special Contribution'), See "Commerce", 14th June, 1947.

'The experience of the war showed that the greatest deficiency in British Industry was the shortage of scientists and technologists who could also administer and organize research and apply the results of research to development.' Statistics show that before the war, the output of the universities and technical colleges in England and Wales alone was about 2,000. This output which proved inadequate for the purpose of the war was increased to 3,000 in 1943, and the Barlow Committee, therefore, made a number of recommendations for doubling the output of such institutions.[1] The Percy Committee attributed the failure of the universities and technical colleges to meet the demand of industry in the past partly to deficiencies in courses of education and training and partly to faults of industrial organization.[2] In order to overcome this defect, this Committee strongly recommended that all students of technology whether at universities or colleges of technology should be introduced to Management Studies especially in the final year or two years of their undergraduate courses.

The Ministry of Education has in fact from 1944 paid increasing attention to this subject, and in September 1945, a meeting of the representatives of professional bodies concerned with the part-time study of Management in technical colleges was convened to consider whether action could be taken to co-ordinate their requirements. As a result of the resolutions passed at this meeting, the Committee on Education for Management was appointed, which has made a number of important detailed recommendations for the organization of the courses in Management and the establishment of an Advisory Council for Education in Management which is to be associated with the Central Institute of Management. Even these recommendations, which were originally made in 1946, have been amended after

1. Report of the Scientific Man-power Committee, presided over by Sir Allan Barlow, Paragraphs 24 to 50.
2. Percy Committee Report, Paragraph 41.

a meeting of the representatives of the aforesaid professional bodies. The amended report which has just been published has thus received not only the approval of the Minister of Education, but also of the institutions and associations, represented at the meeting and these latter have agreed to implement its recommendations.[1]

We may now very briefly examine the two trends in Great Britain to which a reference has already been made: (1) the British industry's pulling up its research socks and (2) the establishment of the Central Institute of Management. We have seen that a recent survey of the Federation of British Industries established that there are at present 9,000 graduates and scientific workers engaged on research and development in the British industry and that the total expenditure of these various industries on research amounts to £20 million a year. The Government themselves have increased in the 1947-48 budget, their grants to the Department of Scientific and Industrial Research from £3.45 million to £7.27 million over the previous year. This Department has now started a scheme of co-operative research associations in all departments of manufacturing industries in the country. These co-operative research associations are autonomous bodies which are created through the initiative of leaders of industries themselves and are organized and controlled by governing bodies elected by the subscribing firms. Programmes of research are framed by industrialists and carried out by staffs of their own appointing. The Department of Scientific and Industrial Research has also organized a number of different bases for the granting of aid to these associations established under the co-operative scheme. Separate research associations have also been established for the following industries: iron and steel; non-ferrous metals; cast iron; coal; coke; electrical; cotton; silk and rayon; wool; linen; leather, boots and shoes; cocoa; sugar; chocolate, confectionery and jam

1 See "Nature", July, 1947.

trades; flour milling, food processing; laundering; paint, colour and varnish; pottery and refractories; printing; rubber; welding; scientific instruments; shipbuilding; gas; internal-combustion engines; and paper. The total expenditure of these associations have increased from £280,000 in 1934 to more than £500,000 in 1939 and more than £1,000,000, in 1945. The Barlow Committee (Scientific Man-power Committee) expects an immediate demand for 70,000 scientists in 1950 and the Committee hopes that this is an under-estimate and that this demand would probably go up to 90,000 in 1955. This Committee, therefore, has made a number of suggestions to double the output of scientists of each university in order to make up the deficit between their output and the demand of the industry.[1]

British Institute of Management

It is not difficult to see how the above-mentioned trends have led to the plans for the establishment of a Central Institute of Management. In November 1945 the President of the Board of Trade appointed a Committee under the Chairmanship of Sir Clive Baillieu (the then President of the Federation of British Industries) to formulate proposals for the setting up of such a Central Institution. This Committee was thoroughly representative of industry and Government service and it submitted its report early in 1946. In fact a former Committee presided over by Sir Cecil Weir had already stressed the need for such a Central Institute of Management and had ascertained the willingness of the existing organizations to collaborate in its formation. The President of the Board of Trade in May 1946 announced his full agreement with the principal recommendations of the Baillieu Committee and this year the British Institute of Management has already started functioning, having superseded the British Management Coun-

1. Figures taken from "Foreign Commerce Weekly", January 11, 1947. Cf. also Organization of Scientific and Industrial Research, "Nature", May 4, 1946 and 1st June, 1946.

cil, which comprises of the U.K.'s leading trade and industrial associations interested in management. There is also an influential body of opinion in Britain which holds that the training of civil servants and managers can be and ought to be merged and that this institute of management should have such a wide scope that it mixes civil servants with administrators from the public corporations, local government service and industry, so that the ultimate aim of the institute must be to embrace all questions of management in the widest sense, in industry and commerce, in national and local governments, public enterprise, agriculture and institutional management. For the present, the Institute of Management is expected to take a lead in promoting research in management problems and in co-operating in the development of training and educational schemes, in undertaking propaganda on management practice with a view to raising the standard of management. It will thus have two sides: (1) promotion of training and education, and (2) enquiry and research into management problems. It will thus co-ordinate the efforts of other institutions—universities and colleges of technology—and develop research division co-ordinating and harmonizing the activities of the existing managing bodies and bringing them together through affiliation. The Baillieu Committee Report also stresses that the ultimate aim of the Institute should be to establish itself as a professional body with defined grades of membership, with appropriate criteria for each grade including practical experience as managers. The Government has already sanctioned a grant of £150,000 during the first five years, after which the Institute is expected to become self-supporting.

Australia

A similar institute was established in Australia in 1944 and this Institute of Industrial Management began working in July 1945. For those who have noted the strides which Australia has taken in industrial development especially during

the years of the war, a new outlook on scientific approach to problems of management will not appear surprising at all.

Appropriately therefore the formation of this Institute was made possible by the co-operation and financial assistance of 50 Sydney companies and it is now supported by over 100 business houses.

The objects of the Sydney Institute are:

1. To stimulate throughout the business community a widespread interest in management and to endeavour to establish a greater appreciation of the responsibility of management at all levels, and its status in the community.

2. To encourage a scientific approach to management, the application of scientific methods to the problems of management and the marshalling of the knowledge and experience which are becoming available in Australia fro.n day to day. This proved body of knowledge which will be assembled for use in the service of others will provide the foundation for the establishment of the Institute as a professional organization.

3. To stimulate interest in education and training for management.

4. To serve as a bureau of information; provide facilities for study, promote enquiry and research into management problems, and

5. To provide a post-graduate course and serve as a body to which educational authorities can look for advice and assistance in the development of courses of instruction for students.

Its educational activities include monthly lectures by prominent specialists on various aspects of management, Discussion groups, Conference and Research groups on such subjects as Incentives, Personnel Management, Visual Education and Research Service. It is not necessary for us to detail the activities or programmes of such training institutes in Australia, but it may be noted that Australia too has participated in this

year's International Congress of Industrial Management.[1]

III

Three Kinds of Institutes

The foregoing examples must undoubtedly carry their own lessons. It is certainly not intended to convey that American methods, or for that matter even British methods, should be transplanted to our country. But it is certainly significant that the two widely differing systems of education have now converged to emphasize the same kind of training. Technological possibilities of scientific achievements cannot be fruitfully attained unless the new problems of business management are competently handled. In India various universities have their faculties of commerce and such universities like Bombay and Allahabad have been making earnest endeavours to relate their curricula to the requirements of business. But these universities can easily think of establishing schools of commerce and business administration, where the curricula may be graded for the matriculates, for undergraduates who may enter business after two years of collegiate work in cultural subjects and for graduates who desire to specialize in higher types of management and business research. Thus immediately after leaving the high schools or after two years of undergraduate study at colleges, or even after graduation, systematic training in business administration can be imparted so as to equip the prospective entrants into business with the necessary insight into the working of business methods and practices. This kind of co-ordination between universities and business houses can be easily instanced by taking the case of the

1. See "Australian Exporter", April 1947 for the details relating to the Institute of Industrial Management at Sydney and the paper submitted by the Australian Delegation to the Stockholm Congress.

sugar or textile industry in our country. The sugar industry has already established a technological institute at Cawnpore and the Ahmedabad Millowners' Association has just prepared a scheme for a textile institute at Ahmedabad (costing Rs. 48 lakhs).

The more detailed problems of these industries can be studied both by the technical man and the non-technical man by entering into these groups or similar groups of industries. It is true that individual business firms cannot normally be expected to interest themselves in such problems of education, but it may certainly not be difficult for the 100 odd chambers of commerce that have been established in the country to work out a plan for such co-ordination. We have already referred to the University of Cincinnati in the United States where a co-operative plan for commercial training has been evolved so as to afford practical experience in business training.

A scheme of training institutes can also be devised somewhat on the following lines. These may be of three different kinds:

(1) Institutes which may or may not be independent of universities and which may be technical institutes in themselves like the Manchester Institute of Technology.

(2) Those which take up undergraduates and train them for the general business and technical sides of different groups of industries, or commerce—say, the Engineering Industries, or Chemical Industries, or Textiles, or Sugar and so on, and

(3) Graduate Schools of Business Administration, such as the Harvard University School, about which we have described at some length, or similar schools at New York and California, for imparting knowledge of the more responsible types of management and business administration. These can only be established at the principal industrial and commercial centres in the country, because such training involves

a study of actual business cases and instruction through discussion based on situations which members of a class may have been given an opportunity to study and appraise in advance. It should also be one of the principal aims to forge a link between the executive authority and the scientific world and establish a liaison between industrial management which shapes industrial policy and scientific establishments.

The other part of the Plan—the team research aspect, as the Americans would say—refers to institutes for business research and a Central Institute of Management in which all these organizations can collaborate and which can embrace all questions of management in the widest sense of the term in industry and commerce. Today fortunately in our country some interest has already been aroused in research, though in the business world this is largely confined to technological research. The problems of business research to which we refer here relate to the common questions of industries or even firms that require to be investigated (and for which a common solution is desired). There are in fact a number of problems in which universities may not normally be expected to interest themselves and which must therefore be entrusted to such institutes of business research. It may also be added that if this newly awakened interest in research is not canalized into useful channels, there is danger of its being frittered away or dissipated, and the cause of research suffering a setback.

It is also not frequently realized that research is generally of two kinds: (1) scientific research as such and what is now known as the publication of fundamental knowledge, and (2) the adaptation of discoveries to new facts and to practical production. The success in the first of these largely depends upon the psychology of the individual and the creation of conditions which will call forth in each worker the correct mental outlook that must be provided. Essential in this

aspect is the atmosphere in which work is conducted—the atmosphere of freedom and detachment. 'For the research worker is required an atmosphere of freedom; that freedom which will allow him to follow his bent wherever it may lead him. Such work is conducted for the work's sake, without thought of possible material uses; and it is such work that lays the foundation of all technical development. It was not the search for a means of harnessing atomic energy that formed the incentive to the study of the structure of the atom, but the urge to extend the bounds of human knowledge.'[1]

The second aspect of research requires an aptitude for interpretation which is perhaps more common than that for the former, and the demand for this equipment is bound to increase, as the work of fundamental research progresses. Here mass psychology is involved and practical achievement will follow only when fruit-bearing aspects of knowledge are sought to be emphasized. This may be called the field of interpreters.

These institutes of research will also provide to a large extent the much-needed corrective to the mental outlook which has somehow taken 'cramming' as its end, the criterion of ability being that of passing out of examinations only. The university undergraduate will then look forward to a field where his equipment will not only be put to a test, but his own spirit of enquiry will lead him to something which he can demonstrate to be useful. In the wider field, these questions of business management and business research can also aim at applying organized intelligence as far as possible not only in understanding, but in directing change, and what is more in sustaining the bulwarks of active democracy. For this purpose, it is very necessary that the higher types of institutes of management and particularly the Central Institute of Management at the apex should be able to organize both research and its interpretation in an atmosphere of detachment of the aca-

1. "The International Sugar Journal", September 1946, p. 228.

demician as well as the experience of business leadership. The Central Institute of management should therefore be a body which is 'above suspicion'. It should command the confidence of the community at large, the respect of the academicians, as well as the active support of the business leaders. In the absence of such an independent body, there is every danger of landing ourselves into a powerful oligarchy which would, in practice, control science, as well as men of science.

Conclusion

In the foregoing pages, we have dealt with a problem of post-war stabilization to which, we believe, sufficient attention has not been paid. It is not merely a problem of mobilizing scientific man-power, but one that touches our educational as well as industrial organization.[1]

There is so much talk about wage levels and full employment, but the inefficiency and wastefulness of labour that have crept in during the war years also require attention. The present spectacular decline in the efficiency of our leading industries can be attributed, no doubt, to numerous factors. But we must also be bold enough to admit that one of these important factors has been the decline in our labour efficiency. Again, whereas in most industries wages levels have risen and hours of work reduced, very little attention is paid to the useful employment of leisure. Together with these problems, India also shares with the other countries, the difficulty of solving the problem of the shortage of scientific man-power.[2] It has to be remembered that

1. In all the foregoing pages, the assumption of course has been that utmost use will be made of the scientific and administrative talent that is already available. The present writer would, however, like to record with utter dismay examples like the following:

In a leading city, a post-graduate department had almost come to a standstill, as the post-graduate teachers had been engrafted into Government service, whereas at the other end of the town, there were six University Professors in the same science, who would presumably have very willingly spared an hour a week, or fortnightly for the benefit of the aspiring post-graduate students.

2. As these pages go to the press, the Government have just released the Report of the Committee on Technical Personnel presided over by Dr S. S. Bhatnagar.

when the talk about planning, which has now subsided, will again rend the air, this shortage of scientific manpower is likely to prove a bottleneck unless steps are taken to avoid it.

There is indeed a good deal of talk about industrial research, and there are also efforts to establish close links between university-training and the needs of the industry. But these efforts are mainly directed towards converting the results of research into productive processes by bringing technological research in laboratories closer to the requirements of industrial establishments.

It would be readily conceded that on the one hand universities are bound to play an increasingly important role in society and on the other commerce and industry will provide a widening field for the employment of university-trained men. It is not then to be wondered that the universities are being judged—and will be judged—by the contribution that they make in supplying the growing requirements of the community. We propose to confine our attention to two main issues: (1) that of improving the efficiency of technical and non-technical men in industry, and (2) that of proposing a scheme of training for personnel management in the higher types of business administration and business research.

In order to successfully tackle these issues, over and above the new outlook on education which is developing, there is need for bridging the gulf that has come to exist in both countries between technical training and the Humanities as a result of specialization. If at the same time universities are expected to play an increasingly important role in society, it will also be necessary to eliminate the hiatus that has somehow come to exist between businessmen and those coming out of the universities. A better psychological approach to the university-trained men and greater collaboration between the universities and business houses are indispensable

for the avoidance of this conflict.

As regards the emphasis on training for business management, it is not to be wondered at in this age of managerial revolution. No such scheme of training can ever succeed if the present causes of discontent, like lack of opportunity or inadequate remuneration are not carefully eliminated and a more correct and sympathetic attitude developed towards new entrants into business with a view to develop better co-ordination between the administration and technical sides. In this connexion, universities may also think of instituting Appointments Boards, which would give proper information and guidance to undergraduates seeking business careers. We have endeavoured to show that for a solution of this problem it is necessary to handle properly the problems of management. It was with a view to strengthen this argument that we have dilated, dealing at some length on the systems of training in the United States, Great Britain and Australia. These widely different systems, now coming to emphasize the same issues, should abundantly prove the need for education for management.

In India, many universities have been witnessing a great influx of students for science and technological courses. The quantitative aspects of this influx may not be serious in India, but it is very necessary that steps should be taken to co-ordinate technology and administration, production and research, both at the undergraduate and post-graduate levels. A new, dynamic and less mechanical conception of industrial efficiency is needed so that the problems of industrial peace may be understood in the light of the close interlocking of social, technical and economic factors.

With a view to bring about greater co-ordination on these lines, it is also suggested that business houses should adopt a policy of establishing close links between the technician and the administrator, besides fostering co-operation between departments of technology

and themselves.

Finally, the problems of scientific management can be more successfully tackled by establishing institutes for imparting training in business administration at various levels, with an Institute of Management and Business Research at their apex, for organizing and interpreting business research.