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CONTENTS

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INCENTIVES IN MANAGEMENT AND PRODUCTION

ALTHOUGH in his speech at the outset of the debate in March in the House of Commons on the economic situation in Great Britain, Sir Stafford Cripps emphasized the importance of the necessity for some incentive element, throughout the wages structure, which would be an inducement to a higher rate of productivity, and elaborated further the policy foreshadowed in the White Paper in that respect, the Budget proposals showed little evidence of the Government's intention to implement that policy. The debate on the economic situation tended to concentrate attention on this question of incentives, and on that of securing the most effective distribution of man-power. Mr. Lyttleton brought strong support to Sir Stafford Cripps' observations on the importance of incentives, and Wing-Commander Millington's example of the increase in output of bricklayers from 80 bricks to 462 bricks per man per day as a result of incentive schemes shows what can be done by the introduction of incentive schemes into wage systems.

The vital bearing of both these factors on the industrial and commercial efficiency, on which, as Sir Andrew Duncan rightly said, rising standards of living, increased leisure and social security all depend, was fully displayed in the debate, although the significance of the Prime Minister's remarks about mixed incentives was passed over. Doctrinaires on either side will do real harm by attempting to exclude either the public or private interest motives. Few men and women are not influenced both by the idea of public service and by private profit, and which incentive is the more effective will depend on circumstances, and on the type of person. What needs to be remembered is that the question of incentives is not restricted to one particular class: it is as important among the professional and managerial class of workers as among the manual workers. While, however, the importance of efficient management is now widely recognized, the question of management incentives has received nothing like its proper attention. It is fully as important as that of the wisest distribution of our resources in administrative ability, over which such concern was expressed in the House of Commons debate on man-power on March 19.

Taking the brain-power of Great Britain as a whole, we have to do two things. On one hand, we have to see that it is deployed to the best advantage —that neither the Armed Services nor the Civil Service are allowed to draw excessively on the limited resources of trained man-power, scientific or otherwise, leaving the universities each year, and that within the Services as in industry those resources are fruitfully and fully employed. On the other hand, we have to see that the conditions of service are such as to stimulate those men and women to exert to the utmost the abilities which they possess.

It is realized that the allocation of technical knowledge between the competing demands of

defence, industry, medical research, etc., is no simple task. Even a system of priorities demands constant scrutiny and revision, and only incessant vigilance can eliminate waste even if man-power has been allocated in accordance with the most rigorous and satisfactory scheme of priorities. Moreover, the debate on defence on March 20 gave rise to some uneasiness that in certain fields the distribution of trained man-power is out of balance.

In a speech in the defence debate on March 19, Mr. A. V. Alexander announced that during the coming year some £60 millions would be spent by the Admiralty and the Ministry of Supply in scientific research and development. He had already, in the debate on the economic situation in Britain, indicated that, of the man-power in the Armed Forces, some 46,000–47,000 were engaged in such work. The estimated expenditure of £3,118,000 of the Department of Scientific and Industrial Research includes some for military purposes, and the grants to universities and agricultural colleges and institutes include large sums for maintenance and teaching costs and the usual apparatus of student life; hence *The Economist* is probably not far wrong in its estimate that out of an anticipated expenditure of slightly less than £19 millions for research during 1947–48, including that on the Agricultural and Medical Research Councils, Colonial research, the universities, and research financed directly by the Department of Agriculture and Fisheries, only some £10 millions is used for research proper.

The contrast between this £10 millions and Mr. Alexander's £60 millions is striking, even when we bear in mind that the figures do not include the unknown but considerable expenditure of private industry on research. But whether the comparison is by expenditure or by man-power, the picture seems out of balance, and however readily it may be possible to justify the expenditure on military research—and the stress laid in the defence debates on the importance of scientific development and research is a welcome and reassuring feature—it at least appears probable that the economic position of Britain makes further assistance necessary from the Exchequer for research in fields bearing on industrial development. Mr. Alexander stated that the Defence Research Policy Committee and the Advisory Council on Scientific Policy would be in general control of policy and priorities, and would concentrate their energy on stimulating research in fundamentally new fields which scientific discoveries have opened up. On the picture thus presented, they will need to grapple more seriously with the distribution of the country's scientific man-power and material resources than the Government has yet attempted to do. It is at least a sound reason for Sir Henry Tizard's tenure of the chairmanship of both bodies.

The distribution or redistribution of man-power in any field is admittedly a difficult problem; but despite the attention focused upon it in recent debates, few constructive proposals have been forthcoming either from the Government or the Opposition. Reliance appears to be placed in the main upon incentives, and although the operation of a system of incentives either as a factor in attracting man-power or brain-power where the interests of the nation most require them, or in increasing output, is handicapped by shortages of raw materials, equipment and labour, the importance of incentives is not easily over-stressed. For all that, Mr. R. A. Butler appears to have been alone in the recent debate on the economic situation in stressing the importance of incentives for the management and others in industry as well as for the manual workers.

The point has not entirely escaped Political and Economical Planning, which in a recent broadsheet, "Men, Management and Machines", pointed out that first-class management will not be obtained while every manager is liable to indiscriminate political denigration. The psychological factors are in fact even more important than the financial incentives for the manager, and also for the research worker, and an interesting little note "The Requirements for Fruitful Research" printed in a recent issue of the *Journal of Chemical Education* (24, 165; 1947) is rather marred by its failure to recognize this. In this article a distinction is drawn between the worker in pure science and the worker in applied science, and the investigator in applied science is designated interpreter.

The distinction between pure and applied research is much less clear-cut than is suggested in this note, though it is rightly urged that the function of the applied research worker is "to deliver the goods", and that industry will judge his success by the measure in which his work leads to practical results. Few research managements, however, would to-day agree that adequate material rewards alone would suffice to attract the best men in adequate numbers. Individual rather than mass psychology is also important, and for fruitful industrial research the atmosphere and conditions of work are little less important than in fundamental research in the university. The atmosphere of freedom matters, too, even if there must in the nature of things be restraints that do not, and should not, apply in the university, where fundamental research finds its natural home.

What is overlooked in this little note is the interaction between the university and industry. If it is important that a university should rigidly guard its freedom and abstain from entering the field of applied research, it is equally important that conditions within the university and within industry should be such as to foster the free and full exchange both of staff and of knowledge. Neither will benefit from disparities in conditions of service, financial or otherwise, which denude one or the other of a proper proportion of the highest type of ability it needs. One of the greatest problems facing Great Britain is in fact to provide in industry and in the public service conditions which stimulate to the highest degree the creative thought, the enterprise and adventurousness which mark the ideal investigator at the university seeking to extend the bounds of human knowledge.

That indeed is the position taken up by Mr. W. B. Wiegand, director of research of the Columbian Carbon Co., in a paper, "Motivation in Research",

in *Chemical and Engineering News* of October 25, 1946. Mr. Wiegand emphasizes the complex character of motives or incentives in research, and observes that it is a mark of true insight to foster and encourage the adventurous phase of research. The competitive spirit, he holds, cannot be ignored, and need not be discouraged. Mr. Wiegand recognizes the value of a generous publication policy and of taking care to ensure that individual recognition is forthcoming for good work; but however careful we may be to establish the right conditions of service, the spark of leadership will always be indispensable for the most fruitful results. Motives and emotion are indivisible, and a friendly, loyal and appreciative management is as vital a factor in research as it is in the handling of men in production or distribution, and one which no elaborate equipment or careful organisation can displace. Indeed, the very fact that industrial research depends so much upon teamwork enhances the importance of leadership in this sense as contrasted with the direction of research.

The point was well brought out by Mr. L. C. Gabriel in his chairman's address to the Road and Building Materials Group of the Society of Chemical Industry last year. Industrial research must obviously conform to a long-term predetermined plan, and the leader of any research team must exercise mental discipline to ensure a proper relation between achievement and the agreed plan. Much latitude in detail must be allowed to all responsible staff, and the control from above must seek essentially to promote a voluntary discipline to prevent helpless drift and to turn individual enthusiasm into profitable channels.

Such psychological factors are more important than the physical conditions of work. This is not to deny that a research team works most fruitfully in a modern well-equipped laboratory, with pleasant surroundings, facilities for reading and writing and for formal and informal discussion, nor to suggest that there are not many industrial and indeed academic laboratories which fall far short of any reasonable standard in this respect. But it is well to remember that, in research as much as in industry at large, there is a factor of management or leadership which is indispensable to enable our objectives in research or in production to be attained; no organisation, on the national scale or in the laboratory itself, which disregards this factor can hope to succeed or to secure that higher standard of productivity and greater output upon which national recovery depends.

From this point of view the problem is similar whether we approach it from the aspect of labour or from that of research. The manager or administrator has to take account increasingly of the human factor and to devise the conditions of work and the incentives which will induce men and women willingly to give of their best. In so far as nationalization of an industry promotes such an atmosphere of co-operation—as is probably true in the coal industry—it is *a priori* to be welcomed, provided there are not other factors in nationalization which militate against efficiency. It must be borne in mind that so far there has been little evidence that the public corporation provides the conditions of service or the incentives which stimulate enterprise, initiative and first-class efficiency in the administrator in quite the same way as the best concerns in private industry.

It has already been suggested that this may well be our biggest problem. It is admittedly difficult and complex, but there are new opportunities opening up before us, and new instruments being created which may be used to find the way to a solution. It is one to which the National Coal Board may rightly be expected to give some consideration, and it is pre-eminently one for consideration and study by the new British Institute of Management and the Administrative Staff College. Other bodies too, such as the Institute of Industrial Administration and the National Institute of Industrial Psychology, have contributions to make, and the trade unions themselves could help if they were minded to take a more positive and constructive view of their functions. Bonus schemes and other financial incentives for the research worker and manager might well be re-examined objectively by such bodies; but much more is required. The creation of the right atmosphere and conditions of co-operation, and the discovery of the organisation and intelligence system which industry and society need to meet the increasingly complex demands of to-day, require co-operation from many quarters, and above all in the same spirit of impartial patient searching for truth which animates the research worker in his own laboratory investigations. Moreover, the growing importance, if not necessity, of a scientific approach to labour problems, as urged by Mr. W. C. Puckey in a stimulating paper before the Royal Society of Arts on January 29, with all that such an approach connotes, in training for management and in a scientific outlook on the part of the manager, emphasizes once more the necessity of a considered attempt to ensure that the administrator, no less than the research worker, is both adequately trained for his job and also given the essential conditions for doing it.

INDIA AS A SOCIAL KALEIDOSCOPE

Caste in India

Its Nature, Function and Origins. By Dr. J. H. Hutton. Pp. viii+279. (Cambridge: At the University Press, 1946.) 18*s*. net.

THIS 'brief conspectus' is for students, and assumes in its readers some knowledge of India and anthropology. Dr. Hutton claims no novelty, and draws freely on the accounts of Blunt and O'Malley (1931–32) and on his own Census Report of 1931, two important extracts from which, on 'untouchables' and on primitive religion, are reproduced *in extenso* as appendixes.

The ground is covered in three sections, each of four chapters. Part 1, "The Background", after a rapid glance at the races and languages of India, gives a short account, province by province, of such castes and tribes as illustrate the "almost incredible diversity" of Indian society. Part 2, "Caste", is