

NATURE

No. 4114 SATURDAY, SEPTEMBER 4, 1948 Vol. 162

CONTENTS

	Page
Second Thoughts on University Expansion	349
Evolution in Mankind. By Prof. H. J. Fleure, F.R.S.	352
Towards a Mathematical Sociology. By Prof. R. G. D. Allen	352
The Uniform Calculus. By Prof. L. M. Milne-Thomson	353
Science in Relation to History. By W. L. Sumner	354
Insecticides and Fungicides	354
Centenary of the American Association for the Advancement of Science. By Dr. F. R. Moulton	355
Antibiotic Activity of Growth-Factor Analogues	356
Partition Chromatography on Paper, its Scope and Application. By Dr. R. Consden	359
Obituaries:	
Mr. S. G. Brown, F.R.S. By H. Pasmore	361
Prof. Marcel Brillouin. By Dr. R. Fürth	362
Prof. Beatrice Edgell	363
News and Views	363
Letters to the Editors:	
Mechanism of the Oxidation of Gaseous Formaldehyde.—Chas. A. McDowell and J. H. Thomas; Prof. R. G. W. Norrish, F.R.S.	367
Further Experimental Evidence for the Theory of Quasi-Properties.—Dr. G. W. Scott Blair and J. E. Caffyn	368
Ionic Reactions in Liquid Dinitrogen Tetroxide.—Dr. C. C. Addison and R. Thompson	369
A General Solution for the Force Constants of Polyatomic Molecules.—P. Torkington	370
Study of the Action of Ultra-Violet Light on Urease by Means of the Ultracentrifuge.—Dr. A. D. McLaren, E. Sheppard and J. Wagman	370
Use of the Calyx Burner to Determine Combustion Conditions.—A. R. Bennett and D. Harrison	371
A New Method for the Preparation of Adsorbents for Chromatography.—D. E. Weiss	372
Fine Structure of the Hydrogen α -Line.—Dr. H. Kuhn and G. W. Series	373
Photodisintegration of Deuterium and Beryllium by Thorium C γ -Rays.—D. L. Allan and M. J. Poole	373
Cold Working of Aluminium at Low Temperatures.—T. S. Hutchison	374
A (?) Promethan <i>Austra/opithecus</i> from Makapansgat Valley.—Prof. Raymond A. Dart	375
Indications of Cephalic Sutures in Trinucleidae and Harpedidae.—Dr. Archie Lamont	376
Changes in the Incisor Teeth and Incisal Alveolar Bone of Rats in Hypervitaminosis A and Avitaminosis A.—Prof. J. T. Irving	377
Marine Fish Cultivation.—Dr. F. Gross; L. H. N. Cooper and G. A. Steven	378
Arctic Aerobiology, II. By Dr. S. M. Pady, Dr. C. D. Kelly and Prof. Nicholas Polunin	379
Formation of Hydrogen Peroxide in Water Irradiated with X- and Alpha-Rays. By Dr. P. Bonet-Maury and M. Lefort	381
National Institute of Industrial Psychology. By T. H. Hawkins	382

SECOND THOUGHTS ON UNIVERSITY EXPANSION

THE almost simultaneous publication of the Nuffield College Statement "The Problem Facing British Universities" and the symposium on "Entry and Careers" in *The Universities Quarterly* for August provides valuable material for further discussion on the expansion of the universities. The former Statement brings together much useful statistical information as well as collecting in its chapters on the demand for university graduates estimates of intake to the professions which are not otherwise conveniently accessible. Moreover, in the further chapter on the flow from the schools the Statement does something to meet a point made by Dr. Eric James, high master of the Manchester Grammar School, at the British Association conference on "The Place of Universities in the Community" last year, as well as to supply a factual background to Dr. J. F. Mountford and Mr. James Hemming's contribution to the symposium. Indeed, the Statement contains so much factual information that it is not easy to see the wood for the trees, and the conclusions seem to indicate that the members of the Nuffield Committee have not been entirely sure of themselves for that reason.

The Statement sets out in the first place to survey the chief demands made on universities, and after reviewing those made by the organised professions and other regular occupations which rely for recruitment on university graduates, including the demand for admission from overseas students, which is expected to be strong for some time, it considers the extra-mural work of the universities and the position of the higher technical and other specialized institutions. While the Statement does not commit itself to any quantitative estimate of the extent of university expansion, the Committee regards a permanent expansion as probable and appears to be satisfied that there is little risk of the large number of graduates failing to find employment. On the other hand, it formed the opinion that in the aggregate present demands are probably exaggerated, and that if the demands are pressed separately and dealt with piecemeal without consideration of their interrelation and aggregate effect, there may be real danger that legitimate but sectional needs will be met to the neglect of other needs of greater importance to the maintenance and development of the universities.

The Statement is thus first and foremost a challenge to fresh thought about the purpose and functions of a university, and as a result of that thinking to determine principles by which sound decisions can be made in balancing new claims against existing duties or one new claim against another. The Nuffield Committee does not, it is true, go very far in its analysis. It insists that in the first place there must always be an element of general education or culture in the teaching a university gives, and that, in the second place, this teaching must be given by scholars and men of science who are themselves working at the frontiers of knowledge. A university must maintain a reasonable range of studies, and not allow its desire to meet any one claim to turn it into

Editorial and Publishing Offices

MACMILLAN & CO., LTD.,

ST. MARTIN'S STREET, LONDON, W.C.2.

Telephone Number: Whitehall 8831

Telegrams: Phusis Lesquare London

Advertisements should be addressed to

T. G. Scott & Son, Ltd., Talbot House, 9 Arundel Street, London, W.C.2

Telephone: Temple Bar 1942

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a specialized institution restricted to serving the needs of a single profession or field of research, nor must any aggregate demands for teaching be allowed to deflect its staff from pursuing their own studies and research. The Committee observes here that it is at least a possibility that in the endeavour to give everyone whatever he wants, the universities may end by giving nobody what he requires.

The two chief suggestions made in the Statement to relieve the universities in meeting the immediate and short-term problems of expansion will be discussed in due course. The Committee recognizes that there is no satisfactory solution to the problem of meeting under present conditions the sudden expansion in the demands made on the universities. Its suggestion as to the extension of the extra-mural work of the universities has a bearing, however, on the long-term problem of expansion with which the universities are simultaneously faced.

The Statement suggests that universities which are adequately staffed might extend the opportunities which they offer to part-time students already qualified by previous education by allowing such students who are prevented from full-time residence to spread their study over a longer period than the usual full-time period, and by the provision of short special courses of the refresher type for those who can only come for a short period. The emphasis thus placed on the extra-mural and regional responsibilities of the universities is welcome: no short-term policy even which severely restricted the discharge of such responsibilities could wisely be accepted. Nevertheless, the Statement does not make it clear how the continuance or extension of such functions will contribute to ease either the short-term or long-term expansion. Like the question of size, on which also the Statement briefly comments, these functions appear to be mentioned chiefly as essentials to be kept in mind in deciding the exact purpose and functions of the universities.

Where the Statement is most disappointing is not so much in not indicating the Committee's own conception of a university and the precise purposes and functions it should serve, as in the absence of any constructive suggestion as to how we are to formulate such a conception or definition or to deal with those questions of geographical distribution of universities and the distribution of university resources among different projects where some co-ordination and concerted effort are essential. It rejects the proposal for a royal commission on universities as imposing a further burden on university administrators and teachers who are already overtaxed, without offering much hope of any kind of an early solution of problems. But to the crucial question whether the universities and the present University Grants Committee are competent to effect such a survey of needs and reforms or whether an external agency is required it gives no answer; but merely states the arguments for the alternative courses.

These arguments are admirably put, but what is required at the moment is decision. The Nuffield College Statement makes curious reading on this

point, with Lord Lindsay as one of the signatories. Lord Lindsay's plea in the House of Lords debate on the universities in May of last year for a comprehensive review of the situation as a whole by some body other than the University Grants Committee is perhaps the most convincing argument yet advanced, not for the departmental committee which he suggested, but for the comprehensive and comparative survey which a Royal Commission alone could be expected to make.

However right it may be to hesitate to designate men and women for such a task when our ablest administrators are already often seriously overworked, that exigency is no more valid a reason for not examining the whole problem at the highest level than it is for not carrying out that survey of the machinery of government at the Cabinet and ministerial level for which the Select Committee on Estimates called in a recent report. Failure to conduct either survey may, and almost certainly will, involve waste of man-power at all levels immensely out of proportion to that involved in conducting the survey. So far as the universities are concerned, the brake on expansion imposed by the building situation may well afford the necessary breathing space for such a survey if a prompt decision is made as to the instrument to be used to conduct the survey. Nor need, it might be added, a royal commission, as opposed to the University Grants Committee, or some sub-committee of that body, employ the time of more than a very few of those actively engaged in university administration or teaching. Not only is there a sufficient reservoir of able minds with some experience and understanding of university problems, but much of the information is already being accumulated by various independent means or bodies; these activities and results require bringing together in a composite picture upon which judgment and decision can be based.

Except in respect of science students, where the analysis of available figures is somewhat limited, the Nuffield College Statement provides a fairly detailed comparison of the expansion of the different universities and university colleges in 1945-47 as compared with the situation before the War. The most interesting feature of the symposium in *The University Quarterly* already noted is the reference to a number of inquiries already conducted by the Technical Personnel Committee set up by the Ministry of Labour and National Service under the chairmanship of Lord Hankey, some of which do not appear to have been published. The quotations from these reports are complementary to the information in the Nuffield Statement and help to fill in some of the gaps that exist in our knowledge of the present situation and the probable demand for particular classes of graduates.

It is well known that while in the autumn of 1947 the number of students in British universities had risen from the pre-war 50,000 to roughly 77,000, the number of science students had practically doubled and stood at 14,500. As regards arts students, if the student population remains at about 80,000, there are expected to be about 12,000 graduates in each

year from 1951 as against 7,000 before the War. In spite, however, of this increase in the number of science students, no substantial increase in the output of graduates available for employment outside the universities is expected before 1950. Thereafter there should be a rapid increase to about 5,000 each year or double the pre-war output. The first substantial increase in graduates in technology will likewise not be effective industrially until 1950, owing to the demands of military service, but by 1951 the output should be 3,400 each year as compared with 1,500 pre-war.

These are figures of which not only the universities but Government Departments as well as the universities should take careful note, and they should certainly guide the Advisory Council on Scientific Policy in considering the distribution or re-distribution of scientific man-power. Moreover, when the development plans of both large and small firms are already impeded by their inability to secure the recruits they require for research and production, with all that involves for industrial recovery and export, the situation disclosed by Mr. L. E. Ball in regard to particular categories is disturbing.

Mr. Ball, the secretary of the University of London Appointments Board, states in this article that there are at present sufficient chemical appointments vacant to absorb all new graduates in chemistry up to 1949 and that demand appears to be increasing steadily. Again, the Technical Personnel Committee, according to Mr. Ball, estimates the demand for chemical engineers for the next five years to be 240 a year as compared with a present annual output of less than 100. The reduction in new construction has, however, reduced the demand for engineers, and in engineering generally it seems that supply is in excess of demand.

This report from the Technical Personnel Committee would seem to be one of three reports which, according to Mr. Ball, have already been issued. One relating to mycologists and microbiologists, stated to have been issued in July 1947, indicated that the present output of microbiologists and mycologists is adequate and that a large expansion is not justified. A similar statement has been made of architects, and ~~some of~~ such inquiries as have been made by the Ministry of Labour and bodies like Political and Economic Planning indicate that most of the professional organisations do not expect any large increase in numbers once their war-time gap has been filled. Mr. Ball, however, expresses the hope that other reports dealing with chemists, biologists and physicists will come from the Technical Personnel Committee without delay, and the figures for physics honours students quoted by Sir Lawrence Bragg were presumably collected for this Committee.

Sir Lawrence Bragg points out that the honours physics schools of our universities are now producing about 600 graduates annually in place of a little more than 200 before the War, and returns from the universities indicate that this number is likely to be maintained for the next few years. Of these graduates in 1947 some 31 per cent entered careers in university or government research as against 29 per cent in

pre-war years, 19 per cent entered industry in place of 30 per cent, and only 12 per cent took up a school teaching career as against 29 per cent before the War.

These figures are no less disturbing than those for chemistry graduates, and although the symposium in *The Universities Review* does not give any clear idea of the magnitude of the university expansion at which we should aim, it reinforces the argument for a comprehensive review of the whole situation and points also to the importance of associating industry with this review. Even from a short-term point of view the distribution of scientific man-power needs to be watched closely or there may be as serious repercussions on the flow of students to the universities for science courses as through the inability of industry to recruit the scientific workers it needs now so imperatively for research and production. Moreover, it seems clear also that only with the help of industry can serious unemployment among those who have graduated in arts be avoided during the next four years. Only in industry can openings be found for a considerable surplus over those who can find places in teaching and the professions, and there is real call for business men and industrialists to re-examine their recruiting policy and reconsider their needs for competent managers at the lower salary levels as well as at the directorate levels.

At the entry side, both Sir Lawrence Bragg and Mr. J. Hemming direct attention to the question of quality. There seems to be little doubt that Great Britain's reserves of innate intelligence are sufficient to provide annually another 50,000 students of as high mental ability as those attending before the War. There is some doubt as to whether all those students would be forthcoming with the other specific aptitudes, including cultural standards, to make the most of a university life. Mr. Hemming is hopeful but Sir Lawrence is dubious. He has formed the impression that while we have not been missing many first-rate people, we are admitting to honours courses too many who would have profited more by training in much less ambitious courses.

The question of selection of students will be brought to the fore when the Working Party in State Scholarships and Major Awards reports to the Minister of Education shortly. The question of the cost of university education on which Mr. P. F. Vowles just touches in the concluding article in this symposium is bound to become increasingly prominent in discussions on university expansion. However fully we may subscribe to the belief that university education is an investment, it must be recognized that both the universities and the State have a duty to see that the considerable sums involved are wisely spent. It has been estimated that it costs £3,000 to provide a student at Cambridge with a three-year course. Even if his parents are prepared to pay £300 towards it, £2,700 has still to be found from public or university funds. Expenditure at the provincial universities is much less, but neither there nor at Cambridge can the nation as a whole afford to spend such sums on individuals who possess neither the brains nor the personality to profit from them.

Neither the Nuffield College Statement nor the symposium in *The Universities Review* does much more than indicate the range of problems to be solved and the imperative need for dealing with them as a whole and not piecemeal. Both challenge creative thinking about the purposes and functions of a university. Both indicate the urgent need for decision as to the body to whom that overall review is to be entrusted and for swift action as soon as the facts can be fully assembled and considered judgment made. It seems equally clear that if the nation's reserves of intelligence are to be trained and distributed to the best advantage, in that review must be joined the best minds that not only the universities but also industry and the nation as a whole can supply.

EVOLUTION IN MANKIND

A New Theory of Human Evolution

By Sir Arthur Keith. Pp. x + 451. (London: Watts and Co., Ltd., 1948.) 21s. net.

THIS book is the fruit of a long life of scientific work and meditation by a distinguished thinker with strong intuitions, trying to look towards a synthesis as yet seen 'through a glass darkly', and trying to make that vision clearer without limiting possibilities of its future adjustment. There is no attempt to force the facts to fit preconceived dogma, no riding of a pet theory to exhaustion.

The basic idea is derived mainly from Darwin, Romanes and Gulick. It is that isolated small, inbred groups are likely to diverge. This view is strengthened by the work of the geneticists, who show that in such a group dominant genes are likely to spread generally among the members, especially if they carry some character of value in the environment concerned. Defective genes may bring rapid extermination, especially if emphasized by close inbreeding.

Keith emphasizes the smallness of the hunter-collector groups in several environments; and he might have made more of the probability that in that stage of social-economic development, Britain is not likely to have had more than a few hundred people in scattered small groups. He directs attention very justifiably to the territorial bases of the little early group which he, in common with all other scientific observers, regards as a basal feature of our heritage from prehuman ancestors. Society is not primarily a human construction, and whatever we may say about social elaborations, they are, as it were, shoots on a prehuman trunk. The territorial basis may be a hunting-range, including perhaps a water supply and so on; the group will typically resent intrusions of strangers and will combine to defend the territory. Here we have Spencer's code of amity within the group and code of hostility outside it, both features of the ethical make-up of mankind, the disharmony between which is our permanent problem. But Keith is concerned with the fact that the code of hostility promotes inbreeding and differentiation, in language and custom as well as in physique; and, at an early stage, the more diversity the less interbreeding. Differences of language and custom are thus factors of isolation which he thinks may be more powerful than mountain or desert belts.

The small group has tended to remain poor, and larger associations of groups have come into existence,

with decreasing uniformity in physique, but sometimes enforced uniformity in language and custom. Inbreeding, dangerous as well as sometimes useful, is less and becomes less still when one group conquers another, and the conquerors, mainly young men, take to themselves the girls of the conquered people. The larger and more complex group has more to defend, and around this gathers the emotion of patriotism; this in turn promotes breeding within the group, so the self-conscious, patriotic group may differentiate itself, even physically, from others in the course of time. A tribesman, says Keith, is apt to transfer his own emotions and impulses to his tribe or group, and we know the power of that group impulse, especially in connexion with the code of hostility. Russel Wallace was the first to emphasize group-solidarity and the accompanying selection between groups as a factor of evolutionary differentiation.

Keith emphasizes fetalization as a factor of evolutionary differentiation. The forehead and many other features in women are usually nearer the foetal stage than those of men. Mongol features, so called, including a low and retracted nasal bridge, an epicanthic fold over the upper eyelid and protuberant eyeballs, are foetal and transitory in a proportion of Europeans, but durable in parts of Eastern Asia and among the majority of Hottentots. These resemblances are not necessarily indications of close genetic relationship.

It has seemed best to try here to give a fairly general picture of Keith's views. The book reviews many stages of human social, as well as physical, differentiation and gives the author's considered opinions. He adheres, for example, to the view that the Piltdown skull and jaw belonged to one and the same individual, arguing against the opinion that they are of different species but not mentioning the bare possibility that the skull might be that of a female and the jaw that of a male.

Keith's idea of inbreeding groups as in process of differentiation leads him to think of them as possibly races in the making; but most groups of the present time are heterogeneous and likely to remain so, and it might be better to use some term other than that of race in this connexion.

The book is one for careful meditation, and is an interesting monument of a respected and beloved personality.

H. J. FLEURE

TOWARDS A MATHEMATICAL SOCIOLOGY

Mathematical Theory of Human Relations

An Approach to a Mathematical Biology of Social Phenomena. By N. Rashevsky. (Mathematical Biophysics Monograph Series, No. 2.) Pp. xiv + 202. (Bloomington, Indiana: Principia Press, 1947.) 4 dollars.

IT is only in quite recent times that mathematical methods have been applied in the social sciences or, indeed, in those fields, such as psychology, where the natural and the social sciences overlap. The use of mathematical-statistical methods in the handling of data, as in biometrics or econometrics, has developed rapidly in recent years. The employment of mathematics as a tool of analysis in the development of theory has been neither as general nor as successful. Mathematical economics, like mathematical biology,