

NATURE

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CONTENTS

	Page
The Atomic Age	161
Universal Principles. By Prof. Herbert Dingle	163
Two Topics in Theoretical Physics. By Prof. Max Born, F.R.S.	165
Nature's Continuous Change. By T. H. Hawkins	165
Rural Life and Work. By R. N. Dixey	166
Phyllotaxis and Organogenesis in Ferns. By Prof. C. W. Wardlaw	167
The Second International Polar Year, 1932-33. By Dr. V. Laursen	170
Modern Methods of Mineral Exploration. Dr. F. Dixey, C.M.G.	171
Anthropology and Art. By William Fagg	174
News and Views	175
Letters to the Editors:	
A New Method of Sampling the Upper Atmosphere.—Prof. F. E. Simon, C.B.E., F.R.S.	179
Production of Ice-Crystal Clouds by Seeding.—D. Fraser	179
Formation of Frozen Rain-Drops and the Condition of Ice-crusts on Trees.—Prof. Kotaro Honda	180
Biosynthesis of 'Asymmetric' Citric Acid: a Substantiation of the Ogston Concept.—Prof. Van R. Potter and Dr. Charles Heidelberger	180
Synthesis of Pyrazine Cyclic Hydroxamic Acids Related to Aspergillitic Acid.—George Dunn, J. A. Elvidge, G. T. Newbold, D. W. C. Ramsay, Prof. F. S. Spring and Wilfred Sweeney	181
Fractionation of Thyroid Iodine by means of Filter-Paper Partition Chromatography.—Alvin Taurog, W. Tong and Dr. I. L. Chaikoff	181
Use of Furan Derivatives in Paper Chromatography.—Dr. H. R. Bentley and J. K. Whitehead	182
Quantitative Paper Chromatography.—Dr. R. B. Fisher, D. S. Parsons and R. Holmes	183
Preparation of Silver Bromide Precipitates for Radioactivity Measurements.—F. P. W. Winteringham	183
Denaturation in Regenerated Protein Fibres.—Dr. F. Happley	184
Sodium Bismuthate as an Oxidizing Agent for Organic Compounds.—Dr. W. Rigby	185
Interaction Terms in the Potential Functions for Polyatomic Molecules.—P. Torkington	186
<i>Lactobacillus lactis</i> Dorner for the Assay of Vitamin B ₁₂ .—Geo. E. Shaw	186
Senescence and Rejuvenation in <i>Lemna minor</i> .—Prof. E. Ashby and E. Wangermann	187
A Parasitic Flea Larva.—R. B. Freeman, M.B.E., and Holger Madsen	187
Experimental Macrocytic Anæmia in the Rat Treated with Purified Liver Extract, Pteroyl Glutamic Acid and Vitamin B ₁₂ .—D. G. Cameron, Dr. S. T. E. Callender, G. M. Watson and Prof. L. J. Wiggs	188
Growth-Cycle of Influenza Virus.—Dr. Forrest Fulton	189
Recrystallization of Relaxed Animal Fibres.—Miss L. Jagger and Prof. J. B. Speakman	190
Piezo-electric Resonator of Ethylene Diamine Tartrate with Zero Temperature Coefficient of Frequency.—R. Bechmann	190
Theory of Viscosity.—F. Balázs	191
Luminous Night Clouds.—J. Paton	192
Abrasion Tests on Diamonds. By P. Grodzinski and W. Stern; Prof. S. Tolansky and E. Austin	193
The New South Wales University of Technology. By A. Denning	195
Academia Sinica (1928-48)	196
Endocrine Glands in Insects. By Dr. V. B. Wigglesworth, F.R.S.	197
Recent Scientific and Technical Books	Supp. iv

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THE ATOMIC AGE 701

MORE than a year ago, the Atomic Energy Commission of the United Nations gave reasons, which no one attempted to answer, why it could see no hope of further progress towards international agreement, and asked to be relieved of its task. The General Assembly of the United Nations insisted in November that the Commission should try again; but that insistence, perhaps, indicated that the Assembly itself found the situation beyond its powers. Nor have events during the year offered the Commission much guidance as to how to proceed. The majority of the Commission seem to be firmly resolved that a measure of general agreement must come before detailed work can be considered on the allocation of quotas, the stages of procedure for control and the sanctions required with which atomic scientists in the United States are anxious to proceed.

Several books on the general theme, which provide useful material for consideration, have recently appeared. The Halley Stewart Lectures for 1948, which have now been published under the title "The Atomic Age"*, on the whole tend to support this majority view. In the main, these lectures add very little to what was said in the series of talks on atomic energy arranged by the British Broadcasting Corporation in March 1947, or in the discussion by a Chatham House Study Group last year. Prof. P. M. S. Blackett and Prof. M. L. E. Oliphant both took part in the B.B.C. talks, and the latter also participated in the B.B.C. discussion. While the implications for good or ill of atomic energy are stated just as clearly, and there is the same insistence on the need for international co-operation and for a new outlook if man is to enjoy the advantages which may be possible through the application of atomic energy to peaceful purposes, neither they nor any of the other contributors really point the way to a solution of the dilemma that is responsible for the present deadlock.

One of the new contributors, Mr. Lionel Curtis, in a lecture on the political repercussions, argues as fluently and cogently, as in his book, "World Revolution in the Cause of Peace"†, that the only hope lies in the democracies pooling their forces in peace as they pooled them in war. To do this, he urges that they must first create a government to organise and control these forces for the common defence. The whole problem rests on the question of sovereignty; and to deal with the repercussions of atomic power, we must begin by merging national sovereignties in an international sovereignty. Mr. Curtis's book is of additional value as containing a well-documented account of the various speeches which reflect the trend of public opinion towards Western Union and the Marshall Plan. It includes also a critical review of the evolution of the Federal system in the United States, as well as of The Hague Conference of May 7, 1948, and subsequent steps towards Western Union; but Mr. Curtis's enthusiasm

* The Atomic Age. By M. L. Oliphant, P. M. S. Blackett, R. F. Harrod, Bertrand Russell, Lionel Curtis and D. W. Brogan. (Sir Halley Stewart Lectures, 1948.) Pp. 149. (London: George Allen and Unwin, Ltd., 1949.) 7s. 6d. net.

† World Revolution in the Cause of Peace. By Lionel Curtis. Pp xv+167. (Oxford: Basil Blackwell, 1949.) 7s. 6d. net.

for federation leads him, in stating the theoretical case for federation, to brush aside majestically rather than helpfully the manifold practical obstacles to the process of merging States.

The Halley Stewart Lecture by Lord Russell on values in the atomic age also pleads for a scheme of voluntary federation; but Lord Russell puts all his authority on the formation of a single armed force loyal to one civil authority, which at first must be the government of an alliance in which the United States is paramount. He is as insistent as Mr. Curtis that the dangers of the atomic age require us to modify our adherence to certain of the values upheld by nineteenth-century liberalism, and believes that only by surrendering certain national liberties in this way can we hope to preserve the real freedoms in which creative work and individuality are possible. His lecture is as much an analysis of the idea of national freedom as of the ways of preventing war; but, except in the forthright proposal to accept American leadership, adds very little to what has previously been said.

The really new suggestions in the Sir Halley Stewart Lectures for 1948 are contained in Mr. R. F. Harrod's discussion of the economic consequences of atomic energy. After emphasizing, as becomes an economist, the economic burden involved in defence against atomic attack, particularly the implications of dispersion, he reviews in some detail the credit side; he reaches the broad conclusion that while humanity might gain some advantage in the diversion of nuclear energy into power for economic purposes, it is not at present *a priori* probable that the advantage would be great. Moreover, if the creation of power for economic purposes in the various countries is permitted, its creation for warlike purposes can only be prevented by a very thorough-going and possibly oppressive system of international control. It is clear from the deadlock on the Atomic Energy Commission that international relations are now such that it is unlikely that nations will consent to such a system, and Mr. Harrod accordingly suggests that all nations should agree to forgo the use of nuclear energy for the generation of industrial power for a term of years.

Mr. Harrod's proposition is thus similar to, though not identical with, that advanced two years ago in the United States by Mr. Cuthbert Daniel and Mr. A. M. Squires, who suggested that, for the present, not even the atomic development authority should mine or process fissionable materials or operate reaction piles which would yield significant quantities of nuclear fuel. Mr. Harrod would ask the Atomic Energy Commission to formulate precisely the nature of the inspection that would be needed to secure the enforcement of this agreement, which should not be inconsistent with the retention of piles of moderate size for the provision of materials for research and medical purposes. The far milder form of inspection involved, Mr. Harrod thinks, might well prove acceptable to all the nations.

This view is reasonable, and the suggestion goes some way towards meeting objections on which the U.S.S.R. has based its rejection of the Baruch plan.

Nevertheless, it scarcely touches the central difficulty of good faith. Freedom of intercourse and free exchange of information are not only important in themselves, but also are of further value as they contribute to good understanding and to mutual confidence between nations. That question of good faith is as unavoidable in considering postponement of the control of large-scale power production until the world is better prepared for it as in considering the control of atomic energy for purposes of war.

Nevertheless, it is interesting to find that, from outside the purely scientific field, reasoned arguments are being advanced that the world should refrain from exploiting the use of atomic power, except possibly on the relatively small scale required for biological or medical purposes, until mankind is morally and ethically prepared to accept the limitations on national sovereignty which are implicit in the degree of international co-operation essential for effective safeguards against the misuse of nuclear energy. While more specific and limited in form, it reflects the essential idea of the Bishop of Ripon's plea for a moratorium on scientific discovery advanced more than fifteen years ago. Nor is it essentially dissimilar from the arguments advanced from time to time in the scientific world for the planning of science on broad lines so as to secure advance along the whole front by diverting resources from fields which appear to be over-cultivated to those relatively neglected.

Fundamentally, there is inherent in all such proposals a recognition that science is not something apart but an essential element in the life of mankind which needs to be in balance with other elements in human life, and indeed requires for its own well-being that those other aspects should be nourished adequately. The realization of the essential unity of knowledge and of human life has become more widespread in the three years that have passed since a series of broadcast talks on "The Challenge of Our Time" took place, in which scientific men such as J. D. Bernal, M. Polanyi, J. B. S. Haldane and C. H. Waddington participated with historians like E. L. Woodward, philosophers such as A. D. Ritchie and Lord Lindsay, men of letters and others like E. M. Forster, B. Farrington, A. Koestler and V. A. Demant; those talks are now available in book form*. Although Prof. Waddington emphasizes in his essay that there is no real conflict between the humanistic and the scientific approach to the problems of to-day, read consecutively the essays leave the impression of a sharp antagonism between morality and science.

Since the talks were given, it is probably true to say that there has been a much more general recognition of the need for a spiritual basis for world order, and that the problem is much deeper than that of the proper use of science, as Prof. Farrington suggests. Something of this can be seen in the lectures delivered at the opening session in Paris of the United Nations Educational, Scientific and Cultural Organisation in

* The Challenge of Our Time. A Series of Essays by Arthur Koestler, E. L. Woodward, J. D. Bernal, E. M. Forster, Benjamin Farrington, Michael Polanyi, J. B. S. Haldane, V. A. Demant, C. H. Waddington, A. D. Ritchie, Lord Lindsay. Pp. 78. (London: Percival Marshall and Co., Ltd., 1948.) 7s. 6d. net.

November and December 1946, which have also recently been published*. In book form, these addresses show little more unity than the B.B.C. talks referred to above; but they provide the spiritual and philosophical background to that Conference, and that of A. H. Compton and three of those on education are constructive.

Dr. Compton, looking on the advent of atomic energy as a part of social evolution, is not content to stress the increased need for co-operation which comes from such activities; he stresses equally the trend towards more education and the increasing concern with life's objectives. His support of Unesco rests on the ability of that Organisation to further these trends. In his view, the power of nuclear energy to enrich the life of man depends on the peoples of the world learning to work together; they must fit themselves for such co-operation by further education, and must select worthy goals which will harmonize the efforts of all. That conception is implicit in H. E. Wilson's address, "Education at a Crossroads", where the need for social and cultural unity is also stressed, and the need for the specialist to see his work in perspective and in a framework of social relations; and it finds even clearer expression in Prof. C. M. Bowra's address on "International Aspects of Education".

The first duty of education, in Prof. Bowra's view, is the pursuit of truth and the need to teach men and women how to find it. Like Prof. Polanyi, he recalls the old ideal and practice of the travelling scholar, passing easily from one European university to another, and pleads for the restoration of some of those old relations and for giving them a new significance, broader and more humane than before. Beyond this, we should see that each nation makes its special contribution to the common stock, and absorbs much in return without losing its individual characteristics. For this process of unification and synthesis, Prof. Bowra looks to the creation of an international university; such a university might offer a more effective contribution to the unification of science than training men in many fields of science. That there is room for men with training and working sense in many fields of physical and biological science, however, will not be disputed; though whether it is necessary to go so far as is suggested by a group of American scientific workers in a recent issue of *Science* is open to doubt. Elsewhere, Dr. W. Bronk has claimed as a characteristic of American culture the gradual union of the physical and human sciences, and especially of the natural sciences with the social sciences and the humanities. The suggestion certainly seems to indicate a ferment in the American universities comparable with that in Great Britain.

The penetrating lectures on Christianity and history which Prof. H. Butterfield recently broadcast were based on the primacy of the Christian philosophy and also stressed the importance of moral factors in intellectual decisions and mistakes. These lectures, like the writings of such men as N. Berdyaev and R. Niebuhr, Middleton Murry and Lewis Mumford, reveal how a

* Reflections on Our Age: Lectures delivered at the Opening Session of Unesco at the Sorbonne University, Paris. Pp. 347. (London: Allen Wingate (Publishers), Ltd., 1948.) 18s. net.

new synthesis of thought is maturing in the minds of great thinkers of our time. The conditions which W. G. Carr defines in the volume of Unesco addresses as necessary for the success of that body are, by and large, those on which the solution of the problem of atomic energy depends. To forgo even for a limited period whatever advantages its development might bring to mankind, even if wise and expedient, is essentially a negative policy; it can only be justified as a temporary expedient if it is accompanied by constructive effort to prepare the world for a positive policy. That point was made most emphatically by Prof. H. C. Urey and Prof. M. von Laue in commenting on proposals by Mr. C. Daniel and Mr. A. M. Squires in a symposium in the *Bulletin of Atomic Scientists* last autumn on the question whether scientific workers should refuse to take part in work for military purposes. They believe that the problem can only be solved by establishing a world government which is strong enough and comprehensive enough to prevent war. This will only come from co-operation and understanding between the nations, which are two of the functions of Unesco. If, as Mr. Carr suggests, Unesco can enlist in its work the help of the outstanding educationists, men of science and other scholars of the world, it may make a really effective contribution to world order, both direct and indirect. But valuable as is every organisation that encourages co-operation and the understanding of all that is involved in such questions as federation and the surrender of sovereignty, the place of creative thinking may be even more important; for from it will emerge the new forms of organisation, and the new means of communicating thought and even information essential to the functioning of a real world community. The synthesis of thought of which there are now such welcome signs can be the source of the vision and the spiritual power required to revitalize our civilization and build a new order in which the noblest elements of man's rich cultural and spiritual heritage find their place side by side with the wider and more potent powers which the new knowledge has placed at his disposal.

UNIVERSAL PRINCIPLES 251c

The Unitary Principle in Physics and Biology

By Lancelot Law Whyte. Pp. x+182. (London: Cresset Press, 1947.) 12s. 6d. net.

THIS book demands serious attention for more than one reason. It represents a significant stage in the course of a line of thought which has been followed for many years and of which the earlier stages have already been described in a succession of writings. The author is, moreover, not—as often in such undertakings—blinded to weaknesses in his arguments by ignorance of essential facts; Mr. L. L. Whyte has a wide knowledge of modern science and the ability to understand its purport. Finally, the problem with which he deals is so fundamental that, if his work is sound, it cannot fail to be of great importance.

Mr. Whyte's aim is to discover a principle underlying all science—physical, biological and psycho-