



SATURDAY, JUNE 29, 1935

No. 3426

Vol. 135

CONTENTS

	PAGE
Social Research and Industrial Reorganisation	1053
The Arachnida. By M. B.	1055
Theoretical Materials and Experimental Structures	1056
Electrokinetic Phenomena	1058
Short Notices	1059
The Geological Survey and Museum	1060
Clinical Science within the University	1062
British Chemical Abstracts	1063
Obituary:	
Sir Robert Blair	1065
Prof. W. E. Scothill	1065
Mr. D. N. Dunlop, O.B.E.	1065
News and Views	1066
Letters to the Editor:	
Ring Structure of Calciferol.—Prof. I. M. Heilbron, F.R.S., K. M. Samant and Dr. F. S. Spring	1072
Colorimetric Estimation of Cestrin in the Urine of Non-Pregnant Women.—Prof. G. F. Marrian and S. L. Cohen	1072
Radio-Transmission of Cosmic Ray Data from the Strato- sphere.—S. Vernoff	1072
The Phosphorescence Process as Revealed by the Luminescence from Solid Nitrogen.—Prof. L. Vegard	1073
The Solution, by the Method of Association, of Problems in Inverse Probability.—Dr. T. E. Sterne; Dr. Herbert Dingle	1073
The Breeding Age of the Yellow-bellied Toad, <i>Bombina</i> <i>variegata variegata</i> , Linn.—R. Maxwell Savage	1074
Fossils as Indicators of Continental Drift.—Prof. A. E. True- man; Sir Arthur Smith Woodward, F.R.S.	1074
Statistical Aspect of the Production of Primary Lesions by Plant Viruses.—Dr. W. J. Youden	1075
Coagulation of the Blood as a Chain-Reaction.—Dr. Albert Fischer	1075
Oscillations of Hollow Quartz Cylinders.—L. Essen	1076
Plasticity of Crystals of Sylvine.—Prof. E. W. Zehnowitzer	1076
Electrolytic Method for obtaining Bright Copper Surfaces.— P. A. Jaquet	1076
Twinning in Alpha Iron.—Hugh O'Neill	1076
Dissociation Energy of the CO Molecule and the Sublimation Heat of Carbon.—P. Goldfinger and W. Lasareff; B. Rosen	1077
Research and the Library.—J. L. Berry and Dr. Wilfrid Bonser	1077
Prediction of Earthquakes.—F. Twyman, F.R.S.	1078
Research Items	1079
The David Dunlap Observatory, Toronto. By Sir Frank Dyson, K.B.E., F.R.S.	1082
Humoral Transmission of Nervous Impulses	1082
Cosmic Ray Results of the American Stratosphere Balloon Explorer I	1083
Surface Chemistry and its Industrial Applications	1084
University and Educational Intelligence	1085
Science News a Century Ago	1085
Societies and Academies	1086
Forthcoming Events	1088
Official Publications Received	1088
Recent Scientific and Technical Books	Supp. v

Social Research and Industrial Reorganisation

ASSOCIATED with the general satisfaction at the improvement in trade which finds expression to-day, there is a desire to understand, and use to advantage, the factors responsible for the better conditions which prevail. It is clear that, on the whole, 1934 recorded a distinct advance over 1933. In most countries unemployment continued to diminish, production to increase and exchanges remained more stable. In some countries the belief became current that the depression was already passing into history. While, however, it may be fairly said that the world's economic life has been running in smoother and deeper channels, it is still far from having returned to the broad, even flow of real prosperity. The imminent dangers of renewed international competition in armaments alone should make even the most thoughtless pause before indulging in extravagant prophecy about the return of an age of prosperity; but there are many other facts which should discourage easy optimism. Not the least of our present perils is that the improvement in trade which has undoubtedly been experienced in Great Britain and elsewhere may be interpreted by partisans as the fruit of policies and methods which impartial investigation might reveal as really hindering recovery.

The annual reports of the director of the International Labour Office provide an expert examination and analysis of the social and economic conditions of the world which assists even the layman to probe the partisan claims with which he is often assailed. Mr. H. B. Butler's latest report* is no exception to the rule. His analysis shows clearly that hopes of a general recovery have not materialised. Recovery is still superficial rather than fundamental. There is still widespread distress and frustration of hope. There is no sign of a general swing-back of the pendulum to prosperity without any basic disturbance of the economic system having taken place and without any serious political consequences having ensued.

There is much indeed in Mr. Butler's survey that is not only highly interesting to scientific workers, but also significantly in line with the conclusions of many among them who have endeavoured to arrive at an impartial opinion on the present situation and the means of recovery. Controversy still unfortunately rages round many

* Report of the Director, International Labour Office, Geneva, 1935

Editorial and Publishing Offices :
MACMILLAN & CO., LTD.
ST. MARTIN'S STREET, LONDON, W.C.2
Telephone Number : WHITEHALL 8831
Telegraphic Address : PHUSIS, LESQUARE, LONDON

Advertisements should be addressed to
T. G. Scott & Son, Ltd., 63 Ludgate Hill, London, E.C.4
Telephone Number : City 4211

questions such as that of public works as a remedy for unemployment, nurtured more by the desire to prove or disprove the value of some economic doctrine or political attitude than by any judgment of the real facts.

If, however, there is one thing which is more and more clearly evident, it is that policies of temporising or dalliance with prejudice rather than facts are not only ineffective but also liable to be disastrous. Everywhere fatalistic belief is giving way to the demand for systematic collective action; and Mr. Butler in his survey notes that, in dealing with the problems presented by the depression, those Governments which have adopted unorthodox measures have, on the whole, succeeded better than those which have relied on the traditional processes. Deliberate interference by the State in economic affairs has continued to increase rather than to diminish. Its success appears to be justifying and strengthening the popular belief that by bold, well-conceived steps planned on a sufficiently comprehensive scale, Governments can influence the course of recovery to a very considerable extent.

This growing reluctance to accept the thesis that human agencies are impotent to control the fluctuations of economic fortune is one of the most significant and hopeful signs of the present time. Its very existence is a psychological element in the general situation which cannot be ignored. In addition, it represents not merely confidence in the ability of man to regain control over events, but also a willingness to accept change, to try new methods. It is a hopeful sign in itself which permits the co-operation of the scientific worker and the application of the scientific method to these difficult problems. There could be no greater tragedy than for the slight recovery which has been experienced in the last year to blind us to the necessity for fundamental investigations and perhaps changes of policy and methods, if the full recovery and the alleviation of the hard core of unemployment and general distress, which are undoubtedly within our powers, are to be secured.

Against this very real danger, one of the surest safeguards is the extent to which recent and more fundamental attempts to modify and adapt the old economic structure to meet the new conditions have been inspired in the main by social considerations. It is not merely that Governments are expected to devote the same energy, ingenuity and attention to the provision of the elementary needs of feeding, clothing and shelter on a civilised

scale as to the promotion of air communications, wireless services and elaborate systems of national defence. Questions of organisation of industry, hours of work and the like are judged more and more from a social point of view than from that of financial or technical efficiency alone.

To these social implications, Mr. Butler, in the report to which we have referred, directs special attention. In commenting on relief of unemployment, he points out that the failure of relief, while warding off actual starvation, to prevent progressive under-nourishment and demoralisation of individuals and families where unemployment is of long duration, is leading to an increasing demand for adoption by the State of energetic measures to create work, whether direct or indirect. His reference to the devastating effect of juvenile unemployment is pertinent in relation to the Jubilee Trust Fund recently inaugurated in Great Britain. For juvenile unemployment, relief affords no solution. "No social problem is of more vital importance and it may safely be said that money saved by ignoring the dangers of intellectual, physical and moral deterioration to which the young unemployed are exposed represents the worst and most short-minded form of national economy".

This growing insistence on the importance of the social factor coincides with a wider recognition of its importance on the part of scientific workers themselves. Julian Huxley has suggested that the main trend of post-War thought, where not merely pessimistic or destructive, is in the direction of science tempered by humanism; and the refusal of public opinion to consider the improvement of production, the growth of retail sales or the appreciation of securities as in themselves satisfactory unless accompanied by a corresponding reduction of unemployment, is paralleled by growing attention to the social factors on the part of scientific workers, whether as affecting the direction or conditions of their own work or as a field for further investigation.

It is in fact at last being widely realised that an elaborate mechanical organisation is often a temporary and expensive substitute for an effective social organisation or a sound biological adaptation. The error of confusing efficiency with adaptation to large-scale production is being more and more apparent, and in many fields, organisation and processes are being judged less by their purely mechanical or technical efficiency than by their social consequences in the widest sense. What the product contributes to the labourer becomes as

important as what the worker contributes to the product.

From this point of view the ideal of fitness for a purpose implicit in technology acquires a new significance. The rationalisation of industry is no longer considered merely from a technical or economic point of view. The entire social situation must be taken into account. A process which promises higher technical efficiency may indeed be rejected, for example, either because of the untoward disturbances it produces in the State as a whole or because of the risks it involves to the health of the worker. As Mumford suggests in "Technics and Civilisation", "a rational society might alter the process of motor car assemblage at some loss of speed and cheapness to arrive at a more interesting routine for the worker. Similarly it would either go to the expense of equipping dry-process cement-making plants with dust removers—or replace the product itself with a less noxious substitute. When neither alternative was practicable it would drastically reduce the demand itself to the lowest possible level".

In this attitude there is essentially no slowing up of progress. On the contrary, while the direction of research may be changed, its scope is enlarged.

The realisation that industry offers opportunities for creative experience which is social in its processes as well as in its objects gives a new impetus to research over a wide front. Such bodies as the National Institute of Industrial Psychology are indeed only faintly foreshadowing the services which they can render, when industry and society are widely permeated with an ideal of efficiency or rationalisation which takes full account of the worker and the social consequences, as well as of the process, the product and the economic return. The following out of the principle of economy in its highest and truest sense means that at least as much attention will be paid to the choice of the correct means of avoiding waste of human effort and welfare as to the choice of the appropriate apparatus or raw materials. The stress laid upon the problem of unemployment in the midst of the Jubilee rejoicings emboldens the hope that, so far from the partial recovery already experienced leading us astray, there is a growing determination to seek new ways and means, if those of the past prove inadequate to solve this problem and secure the wider distribution of the vast resources at man's disposal, could he but make mechanisation his servant and not his master.

Reviews

The Arachnida

The Arachnida. By Theodore H. Savory. Pp. xi + 218 + 8 plates. (London: Edward Arnold and Co., 1935.) 25s. net.

THE Arachnida have been unduly neglected by zoologists, having been overshadowed as objects of study by the beauty and infinite variety of the insects. The study of the class has been difficult, owing to the scattered literature and the scarcity of several of the forms. Of the ten existing orders, only four are represented in Great Britain, and several of the smaller orders do not reach the confines of Europe. Mr. Savory has now given us a generalised account of the class as a whole, for which all zoologists and naturalists will be grateful.

The Arachnida, more than the insects, have attracted the attention of philosophical morphologists, since the days when Strauss-Dürkheim, so long ago as 1829, first pointed out that *Limulus* is an arachnid, and the close resemblance between that genus and the Eurypterida has long been recognised. It is remarkable that of these two primitive groups, *Limulus* has survived, being to-day not only by far the largest arachnid, but

also the only marine one, while the Eurypterida, making their first appearance in the Cambrian, attained their zenith in the Silurian, producing such extreme forms as *Stylonurus* of the Old Red Sandstone, which reached the enormous size of ten feet, with very long legs. These gerontic characters foretold an early extinction, for the order made its last appearance in the early Carboniferous.

In discussing the evolution of the class, the author quotes the theory associated with the names of Ray Lankester and Pocock, according to which *Limulus* and the scorpions were both derived, each through an intermediate link, from the Eurypterida, which in turn, through *Limulava*, came from the Trilobites. In any event, all will agree that the Eurypterida, *Limulus* and the scorpions undoubtedly have a common origin. Zittel derives all three from a hypothetical early Cambrian predecessor, reserving the Trilobites as ancestors of the Crustacea. But, as the author points out, if by this hypothesis he would exclude the Trilobites from being at the same time ancestor of the Arachnida, he is virtually denying evolution.

The critical step in the evolution of the class