



SATURDAY, MAY 18, 1935

No. 3420

Vol. 135

CONTENTS

	PAGE
Large-Scale Research in Crop Production—Cotton	805
Evolutionary Morphology of Plants. By Prof. W. H. Lang, F.R.S.	806
Israel in the Making. By Prof. J. L. Myres, O.B.E.	808
Universities of the British Empire	809
Short Notices	810
The Industrial Transition in Great Britain. By Dr. K. G. Fensholt	811
The Professors of the Royal Institution. By Thomas Martin	813
Obituary:	
Mr. C. F. Cross, F.R.S. By Sidney S. Napper	816
Colonel W. G. King, C.I.E. By S. P. J.	817
Prof. R. Carr Bosanquet	817
Prof. E. Poullsson. By Dr. Ottar Rygh	818
News and Views	835
Research Items	841
Cost of German Scientific Publications	843
Copepods from West Greenland Waters	843
All-Metal Radio Receiving Valves	844
Physical Methods in the Study of Earth Structure	844
History of Bitumen	845
University and Educational Intelligence	845
Science News a Century Ago	846
Societies and Academies	847
Forthcoming Events	848
Official Publications Received	848

SUPPLEMENT:

Letters to the Editor:

Magneto-Optic Rotation.—Sir Joseph Larmor, F.R.S.	819
Concentration of Artificially Produced Radioelements by an Electric Field.—Prof. F. A. Paneth and J. W. J. Fay	820
Nature of Cosmic Rays.—Dr. Pierre Auger	820
Cosmic Rays and Novæ.—Dr. W. H. McCrea	821
The 'Lipotropic' Effect of Protein.—Prof. C. H. Best, M. E.	821
Huntsman and J. H. Ridout	821
Physiology of Whales.—Alec H. Laurie	823
Osmotic Pressure of Fixing Solutions.—J. Z. Young; Dr. John R. Baker	823
Chinese Influence on Western Alchemy.—Dr. William H. Barnes	824
The Ratio 136/137 in Atomic Physics.—Dr. W. N. Bond	825
Auger Effect and Forbidden Transitions.—Prof. H. R. Robinson, F.R.S.	826
Supra-conducting Alloys.—K. Mendelssohn and Judith R. Moore	826
Electrical Resistance of Pure Aluminium at Liquid Helium Temperatures.—H. A. Boorse and Dr. H. Niewodniczanski	827
Range of Action of Surface Forces.—Dr. F. P. Bowden and S. H. Bastow	828
Interchange of Heavy Atoms in Organo-Metallic Methyls.—Mrs. Alice Leigh-Smith and Dr. H. O. W. Richardson	828
Ebulliometric Determination of the Degree of Decomposition of an Organic Substance.—Prof. W. Swietoslawski	829
Ebulliometric Method of Determining the Amount of a Substance Adsorbed on the Surface of Solid Substances.—M. Wojciechowski	830
Compressibility of Electrolytic Solutions.—Prof. H. Falkenhagen and Ch. Bachem	830
Mathematical Psychology of War.—Dr. Lewis F. Richardson, F.R.S.	830
Some Uses of the Air-Driven Spinning Top.—Prof. James W. McBain, F.R.S.	831
A New Test of the Magneto-Ionic Theory.—F. T. Farmer and J. A. Ratcliffe	831
Detonation of Nitrogen Iodide, NI_2NH_3 .—Prof. W. E. Garner and W. E. Latchem	832
A Further Reappearance of the Second Red-Eye Mutation in <i>Gammarus</i> .—K. W. Yarnold	832
Composition of Interveneal Mosaic of Potatoes.—J. B. Loughnane and Phyllis Clinch	833
Physiological Polarity in <i>Aspergillus</i> .—Dr. P. Henrard	833
Preparation of Diazomethane and its Homologues in the Free State.—D. W. Adamson and Prof. J. Kenner, F.R.S.	833

Editorial and Publishing Offices:

MACMILLAN & CO., LTD.

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

Telephone Number: WHITEHALL 8831

Telegraphic Address: PHUSIS, LESQUARE, LONDON

Large-Scale Research in Crop Production—Cotton*

ORGANISED research in furtherance of industry has, in proportion to the interests involved, developed more slowly for agriculture than for industrial commodities or for processing or for transportation. The work of the Empire Cotton Growing Corporation, one of the youngest and now one of the strongest organisations for research on crop production, is, however, an example of bold development. The raw cotton position just after the War, when Great Britain was dependent on the United States for a very high proportion of her supplies, led to the founding of the Corporation in 1921. Production in the newer Empire fields (that is, excluding India) has since then increased from 30,000 to 90,000 tons. The financial support of the Corporation has come largely from the cotton spinning industry which, by promotion of research throughout its own grave depression, has shown striking faith in science. In brief, it is the object of the Corporation "to put the Empire into such a position that it can and will produce, within economic limits, its proper share of the cotton required by the world. . . ."

This main objective is easily seen to resolve into a great array of problems. Where cotton is a more or less familiar crop, increase of yield and improvement of quality bring up difficult questions of disease, of soil fertility, and in some cases of irrigation. But a great increase in the Empire's cotton area is clearly indispensable, and is only possible by extension to territories where cotton has not been grown at all or only scraggily, for simple local use. Here are added to the problems of established cotton areas many new, intriguing issues. Suitable varieties must be found or made. Labour must not only be trained but also, if possible, made more effective by displacing hand tools—for the available new areas are largely in East and West Africa—by cattle-drawn ploughs and hoes. In devising appropriate systems of cropping and cultivation for the new areas lie some of the most important problems. Ancient systems, resting on some form of 'shifting' cultivation, do not readily admit a wholly new crop, and that a cash crop, on any extensive scale. Further, the terrible menace of soil erosion hangs over orthodox weed-free methods in many places, while maintenance of

* Empire Cotton Growing Corporation. A Review of the Work of the Experiment Stations, Season 1933-34. By Dr. J. C. Willis. Pp. 38. (London: Empire Cotton Growing Corporation, 1935.) 1s. 6d.

fertility is a problem of which green manuring, an old, unsolved question of the most progressive European countries, is but a part. There are, too, considerable issues in ensuring supplies of seed, in grading, marketing and transport.

The Corporation has provided for the study of its problems by setting up stations, twelve in number, which besides working independently, collaborate with the agricultural departments of their territories. A post-graduate scholarship scheme has been used to provide a large part of the scientific personnel.

This great research organisation is governed by the Director of the Corporation, with advice from a small scientific committee, which meets in London. Stations have substantial freedom in determining, appropriately to their circumstances, the balance between primarily scientific and more empirical and immediate investigation. A purely scientific research station in Trinidad (not included in the "Review") is maintained for studies in which central effort and the most specialised resources are required.

Suitable collaboration and mutual assistance among twelve widely dispersed and variably circumstanced stations demand—perhaps it is the chief need—a most careful provision for interchange of views and experimental results. A volume of progress reports is issued every year by the Corporation, but this leaves unsatisfied the needs of a great number who, as contributors to the research fund, or as investigators, or as

administrators in the territories concerned, are deeply interested in the realisation of the Corporation's aims. It is for them Dr. Willis's review, with its admirable brevity and simplicity, is issued.

It is natural to find plant breeding the most prominent part of the stations' work, for in new circumstances improved varieties frequently offer the earliest opportunity for agricultural progress. A selection made by F. R. Parnell, of the Corporation's staff in South Africa, has, under the name of 'U. 4', now become famous. Its great value arises from its strong, inherent resistance to the jassid (*Empoasca facialis*), an insect which formerly threatened to inhibit cotton cultivation over most of the southern half of the African continent.

Dr. Willis, in dealing with improvements in agricultural practice, refers to the importance of "work which has a definite bearing, not upon cotton as cotton, but on its satisfactory, efficient, and economical insertion into the general agriculture of the country". This obviously right, though far from common, attitude in research on a single crop, gives to the agricultural studies of the various stations an admirable range and soundness. The actual problems are as diverse as the countries in which they occur—Australia, Rhodesia, South Africa, Fiji, Sudan, the West Indies, and many parts of East and West Africa. The Corporation may be assured that an annual review in the form and the style Dr. Willis adopts in this first essay will be widely appreciated.

Reviews

Evolutionary Morphology of Plants

Primitive Land Plants, also known as the Archegoniatae. By Prof. F. O. Bower. Pp. xiv+658. (London: Macmillan and Co., Ltd., 1935.) 30s. net.

THE publication of a new work by Prof. F. O. Bower dealing with the Archegoniatae is an event of importance in the study of the morphology of plants. For Prof. Bower, who has contributed largely to our detailed knowledge by his investigations, has never rested content with mere description. He has always aimed at bringing the facts under general conceptions or hypotheses. His work has thus never lost the impulse of the evolutionary point of view, whether it has been a direct quest for phyletic lines or, as he here puts it, an attempt "to visualise the Methods of Advance which these primitive Land-Plants appear

to have followed in their evolution". That he has retained this aim and the faith that it may be reached is closely connected with his work having been concerned with the Vascular Cryptogams or Pteridophyta, for these present exceptionally favourable material for evolutionary morphology. They can be studied apart from the later evolved Gymnosperms and Angiosperms, they are represented by varied living forms and they have a wonderfully good and instructive fossil record.

The Vascular Cryptogams are here considered in relation to the Bryophyta, as was the case in "The Origin of a Land Flora", published twenty-seven years ago. The subject matter is the same, but "Primitive Land Plants" is an entirely new work. The changes in interpretation are due to Prof. Bower's responses to the additions in the interval to our knowledge of the facts. The book is divided into two parts: Part I, which occupies