



SATURDAY, DECEMBER 16, 1922.

## CONTENTS.

|   | PAGE |
|---|------|
| Science and the Empire . . . . .  | 797  |
| Wegener's Drifting Continents. By Prof. Grenville<br>A. J. Cole, F.R.S. . . . .   | 798  |
| A New Treatise on Chemistry . . . . .   | 801  |
| Physiology of Respiration. By Joseph Barcroft,<br>F.R.S. . . . .  | 803  |
| Our Bookshelf . . . . .   | 804  |
| Letters to the Editor :—  |      |
| Echinoderm Larvæ and their Bearing on Classifica-<br>tion.—Dr. Th. Mortensen . . . . .  | 806  |
| Rotary Polarisation of Light. ( <i>With diagrams.</i> )<br>—Prof. F. Cheshire; Dr. A. E. H. Tutton,<br>F.R.S. . . . .         | 807  |
| Space-Time Geodesics.—Dr. Alfred A. Robb,<br>F.R.S. . . . .   | 809  |
| A New Type of Electrical Condenser. ( <i>Illustrated.</i> )<br>—Dr. T. F. Wall . . . . .                                      | 810  |
| Sex of Irish Yew Trees.—Dr. C. J. Bond, C.M.G.<br>. . . . .   | 810  |
| The Physiography of the Coal-Swamps. By Prof.<br>Percy Fry Kendall, M.Sc., F.G.S. . . . .                                     | 811  |
| The Royal College of Science for Ireland. ( <i>Illus-<br/>    trated</i> ) . . . . .  | 814  |
| Obituary :—   |      |
| Sir Isaac Bayley Balfour, K.B.E., F.R.S. . . . .  | 816  |
| Sir Norman Moore, Bt., M.D. . . . .   | 817  |
| Current Topics and Events . . . . .   | 818  |
| Our Astronomical Column . . . . .   | 821  |
| Research Items . . . . .  | 822  |
| Physiological Aspects of Physical Measurement.<br>By Sir John Herbert Parsons, C.B.E., F.R.S. . . . .                         | 824  |
| The Design of Railway Bridges . . . . .   | 825  |
| The Alps of Chinese Tibet and their Geographical<br>Relations. By Prof. J. W. Gregory, F.R.S., and<br>J. C. Gregory . . . . . | 826  |
| The Present Position of the Whaling Industry . . . . .  | 827  |
| Biometric Studies . . . . .   | 827  |
| University and Educational Intelligence . . . . .   | 828  |
| Calendar of Industrial Pioneers . . . . .   | 829  |
| Societies and Academies . . . . .   | 829  |
| Official Publications Received . . . . .  | 832  |
| Diary of Societies . . . . .  | 832  |

*Editorial and Publishing Offices :*

MACMILLAN & CO., LTD.,

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

Advertisements and business letters should be  
addressed to the Publishers.

Editorial communications to the Editor.

Telegraphic Address: PHUSIS, LONDON.

Telephone Number: GERRARD 8830.

NO. 2772, VOL. 110]

## Science and the Empire.

**D**URING the past few weeks the minds of many electors in Great Britain must have been disturbed by the storms of rhetoric, appeals to occupational interests, and promises of a Golden Age in the near future, which are common characteristics of a general election. We have seen dozens of election addresses, and almost all of them profess the desire to promote industrial development, and thus reduce the burden of unemployment. The solution of this problem is not, however, so simple as it seems on paper, and is not, moreover, solely a matter of adjusting the conflicting claims of capital and labour. The third pillar of the tripod upon which the structure of modern civilisation has been erected is creative science, yet scarcely a candidate referred to it as an essential factor of national stability as well as of progress.

This is perhaps not surprising, as the number of voters engaged in scientific research or familiar with its productive value is negligible in comparison with the electorate in general upon whose suffrages in bulk depends the position of a candidate at the poll. It is also a consequence of the fact that scientific investigators as a body do not in the public Press or on the public platform assert their claims, or pronounce their principles, so vociferously as do advocates of many social changes and reforms of relatively trivial importance. It is true that there is a National Union of Scientific Workers, but it is a Trade Union affiliated, we believe, to the Labour Party, and it exists to secure suitable conditions of work and payment for its members rather than for the extension of natural knowledge. It is therefore concerned with occupational interests alone, and has almost nothing in common with our scientific societies which month by month add more to the store of human knowledge than was gained in a century in some earlier epochs of modern history. Whatever may be thought of the strength of our position in any other respect, it cannot be questioned that as regards output of originality and inventiveness British men of science are in the front rank of the scientific army and often bear the banner in the van of progress.

We have every reason to be proud of our pioneers who to-day, as in the past, are cutting a way through virgin forests into new lands of promise from which others will gather the fruits; yet their names are mostly unknown even to our political leaders, and their works arouse no interest in the market place. Scientific men are usually indifferent whether the public gives attention to their work or no; theirs is the joy of the chase, and others may dispute over the spoils. This unworldly attitude may excite respectful admiration,



and we should be sorry to suggest that scientific investigators themselves should seek to get into the limelight or take part in the turmoil of politics. They are much better employed in the laboratory than in Parliament. What are wanted, however, are advocates of science and scientific method—men and women who know the disinterested spirit in which purely scientific inquiries are carried on and desire to introduce into social and political discussions the same impartial attitude towards evidence and fearless judgment upon it. At the present time it is in a large measure the mission of science to rebuild a shattered civilisation, not alone by providing the foundations for material progress, but also by introducing scientific methods and the scientific spirit into all fields where questions of national significance are debated.

To attain these ends there must be a much wider understanding of the service of science than exists at present. Science will not advertise itself, but there is every reason why believers in it should undertake a publicity campaign on its behalf. Dozens of interesting leaflets or short pamphlets might be written showing what science means to progressive industry and modern civilisation, and they should be distributed in thousands both to enlighten and to stimulate. Wireless telephony, for example, is a direct product of purely scientific studies. The tungsten used for the filaments in the thermionic valve and in metallic filament lamps generally, was discovered more than a century ago. It enters into the constitution of all high-speed tool steels and every magneto. Manganese, nickel, titanium, aluminium, and other essential constituents of the alloy steels now used for many engineering purposes were all first discovered in scientific laboratories. So also were the thorium and cerium used in the manufacture of incandescent gas mantles, calcium carbide for the production of acetylene gas, the methods of extracting nitrogen from the air to produce nitrates for explosives and agricultural fertilisers, and hundreds of other substances and processes which are now accepted as part of our daily life without a thought of their origin.

The most remarkable of such developments is that of helium gas discovered by Sir Norman Lockyer in the sun in 1868, found in terrestrial minerals by Sir William Ramsay twenty-six years later, and now being produced in millions of cubic feet from certain oil wells in the United States, where all airships are compelled to use this gas instead of hydrogen. It is quite possible that the practical monopoly of helium which America possesses in its rich sources of supply, may be of great significance both in the arts of peace as well as those of war. At any rate, the United States Government is quietly accumulating vast quantities of the gas com-

pressed in cylinders for whatever needs the future may bring.

It is obvious that valuable national and Imperial service can be performed by a body which has sufficient funds to undertake active propaganda work for the extension of an understanding of the influence of scientific research and its results. The only organisation which is attempting to do this is the British Science Guild, founded in 1905 to convince the people, by means of publications and meetings, of the necessity of applying the methods of science to all branches of human endeavour and thus to further the progress and increase the welfare of the Empire. The Guild is thus not a scientific or technical society but a body of citizens united for the purpose of making the Empire strong and secure through science and the application of scientific method. Its relation to the work done in our laboratories is that of the Navy League to the Royal Navy—to watch and promote progress. Lord Askwith has just accepted the presidency of the Guild in succession to the Marquess of Crewe, who has reluctantly had to withdraw from this office on account of his appointment as British Ambassador at Paris.

Active steps are shortly to be taken by the Guild to secure adequate funds for displaying the fertility of British science not only throughout the Empire but also to the whole world. We possess a great treasure, and in these days cannot afford to let it lie hidden. It is devoutly to be hoped, therefore, that when the British Science Guild makes its appeal for funds and members there will be a rich and ready response to it, so that branches may be established throughout the Empire for the strengthening of the foundations of the knowledge upon which our position among the nations of the world depends. The British Empire Exhibition to be held in 1924 will provide an opportunity for showing what science has accomplished, and we look to a body like the British Science Guild to see that the promoters provide in the Exhibition a Temple of Science which shall be worthy of the great achievements of British genius.

### Wegener's Drifting Continents.

*Die Entstehung der Kontinente und Ozeane.* By Dr. Alfred Wegener. Dritte gänzlich umgearbeitete Auflage. Pp. viii + 144. (Braunschweig: Friedr. Vieweg und Sohn, Akt.-Ges., 1922.) 9s.

HOWEVER much conservative instincts may rebel, geologists cannot refuse a hearing to Dr. Alfred Wegener, professor of meteorology in the University of Hamburg. As an oceanographer, he looks out over the boundaries of sea and land; as a meteorologist, he is interested in changes of climate in