

## THE BRITISH ASSOCIATION

BELFAST MEETING, 1952

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THIS year the British Association will meet in Belfast during September 3-10. On three previous occasions Belfast has acted as host to the Association: in 1852, 1874 and 1902. Newspaper comments on these meetings reflect vividly the changed relations between scientists and the public in Britain. The 1852 meeting was scarcely noticed in the local press. The *Belfast News-Letter* reported one paper only—an account of the sanitary statistics of Belfast. There was at the time an outbreak of cholera in Berlin and Warsaw, and the editor's comment was "Let there be a board of health in every house and a humble reliance on the mercy of Him who holds the rod of chastisement, and the plague will pass us by". There was plenty of evidence in the Belfast of 1852 of that public indifference to science which the Association was working to overcome. Twenty-two years later no one could have accused the Belfast public of indifference. John Tyndall had given a presidential address which was interpreted as materialistic. On the following Sunday every pulpit thundered against the Association and its despicable scientists. It was left to T. H. Huxley to heal the breach through his lecture on "The Hypothesis that Animals are Automata". A serious strike of local millworkers was ended through the mediation of the Association, a success which enhanced the prestige of economists, who felt (and at that time rightly felt) they were the poor relations of the Association. The newspapers, though still critical and patronizing, were certainly not indifferent to the meeting. The scientists had stirred the public: some two thousand people attended the meetings. By 1902 the Association's meetings were receiving the serious attention of the press and the respectful interest of the public which we nowadays take for granted. James Dewar was president. The sections met (as they will this year) at Queen's University, and Methodist College and in surrounding halls. Sunday produced an innocuous crop of sermons: the bitter feeling between religion and science, which Newman half a century earlier had shown to be unnecessary, had now vanished except from the minds of a few bigoted reactionaries.

In 1952 the Association is assured of an enthusiastic welcome. The City, the University, and the Northern Ireland Government are making adequate preparations for Ulster to become for one week the focus of British science. Meetings will be held at Queen's University, Methodist College, Stranmillis College, and in the City Museum. Belfast is a splendid centre for excursions, and (apart from sectional excursions) members will have to choose among trips to the Mourne Mountains, the Antrim coast, Donegal, and Dublin. There will be opportunities to see the agriculture of Northern Ireland, the linen industry, shipbuilding and other industries.

For his presidential address, Prof. A. V. Hill has boldly chosen "The Ethical Dilemma of Science". Evening discourses are to be given by Mr. A. C. Hartley (on engineering), Prof. A. Macbeath (on philosophy), and Sir William Slater (on science in agriculture). The sectional presidential addresses in-

clude topics as varied as the assessment of personality (Section J), Britain's food supplies (Section M), and progress in aeronautical science (Section G).

Belfast has the honour of having initiated the handbook on the geography, natural history, and economics of the region, which is now a regular feature of Association meetings. The first handbook was produced in 1874 by the Belfast Naturalists' Field Club. The handbook for 1952 is the work of some dozen authors under the direction of Prof. Estyn Evans. Armed with this book, and with the help of exhibitions illustrating the archaeology of Ulster, and with the co-operation of the Naturalists' Field Club (which is holding a *conversazione* during the meetings) the visiting naturalist, historian or archaeologist will have good opportunities to see during the week what Northern Ireland has to offer him.

A special feature of the Belfast meeting will be its provision for young people. There will be five afternoon lectures for boys and girls: "Seeing is Believing", by R. J. Bartlett; "Noises, Old and New", by Prof. G. H. Bell; "The Honey Bee", by C. R. Ribbands; "Animals of the Past", by W. E. Swinton; and "Travel and Adventure on the Roof of the World", by F. Kingdon-Ward; and in addition a series of biological films. Tickets for these lectures are available only for student members of the Association—not for full members; but they must be secured before June 4. After this date the remaining tickets will be distributed among senior schoolchildren in Northern Ireland. Another special feature for students is a tour of Ireland to be held immediately after the meeting, under the guidance of students from Queen's University.

There will be the usual social events which accompany Association meetings, with one notable addition: Northern Ireland has its own Government, and the Government is to entertain the Association at Stormont. Members will welcome this event not only for its own sake, but also to give them an opportunity of seeing something of the benefits of devolution of government, an experiment in which Northern Ireland has unique experience.

In these days of specialist scientific societies, and with the calendar peppered with technical conferences and seminars, the British Association is no longer the place for the announcement of major new discoveries in science. In recent years the Association has been restored to its original purpose: to be a place where scientists in different fields interpret their work to one another and to the public. It might be argued that this original purpose has now been fulfilled. The public spends some £16 million a year on civilian scientific research, quite apart from £20 million a year spent on universities: surely it is no longer necessary to arouse public interest in science; and in any event have we not the Third Programme, and a flourishing popular scientific literature, to maintain interest? This is a topic which might well be discussed by the British Association itself; but there is not much doubt what the outcome would be. For scientists are now dependent on

public support in a way they never were before. A century ago private subscriptions could at a pinch have supported the whole body of scientific research in Britain. To-day the man-in-the-street is the patron of science. Without his support our universities and research institutions could not pay even their salary cheques for the next quarter. Therefore the interpretation of science to the public has now become a major activity in modern society, not to be entrusted entirely to the efforts of scientific journalists; and the British Association remains the chief instrument for this activity.

## HERBICIDES AND SYSTEMIC FUNGICIDES

THE field of herbicides and systemic fungicides is one in which planned progress depends on the collaboration of chemists and biologists. Such collaboration was exemplified by a joint meeting, held at the Imperial College, London, on March 14, of the Association of Applied Biologists and the Crop Protection Panel of the Society of Chemical Industry.

### Herbicides

The morning symposium on herbicides was presided over by Mr. W. E. K. Piercy, chairman of the Crop Protection Panel. In the first paper, Dr. E. W. Simon, of King's College, London, described the assessment of the relative toxicities of phenol, *o*- and *p*-nitrophenol and 2:4-dinitrophenol by five methods, including tests on fungi and higher plants. The relative toxicities of these compounds were found to be largely independent of the test organism, provided that the comparisons were made at pH-levels at which there was little dissociation. At these levels the descending order of toxicities was: dinitrophenol, mono-nitrophenols, phenol. Lower concentrations were required in tests based on growth responses (*Trichoderma* and *Lemna* tests) than in tests in which respiration-rates of yeast and of infiltrated leaf disks of *Brassica alba* were measured. This finding supported the hypothesis that nitrophenols owed their toxicity to the uncoupling of oxidative phosphorylation. Relatively high concentrations were required to kill *B. alba* seedlings in spraying tests, a reflexion presumably of the high concentration gradient needed to ensure that sufficient of the compound passed through the cuticle and plant tissues to build up a toxic dose within the individual cells.

Mr. G. W. Ivens, of the Agricultural Research Council Unit of Experimental Agronomy, Oxford, speaking on the phytotoxicity of mineral oils and hydrocarbons, made the point that, while the practical use of mineral oils as herbicides had demonstrated that phytotoxicity was roughly dependent upon boiling range and aromatic content, more precise correlations between toxicity and physico-chemical properties were needed before herbicidal potentialities of particular oil fractions could be predicted. Spraying results with individual hydrocarbons indicated that the order of increasing phytotoxicity was: paraffins, olefins, naphthenes, aromatics—the phytotoxicity increasing with boiling point. In such experiments, however, it was difficult to judge how the toxicity estimates were affected by differences in the penetration of liquids into the intercellular spaces of the leaves.

Such differences were eliminated by exposing detached runner-bean leaves to hydrocarbon vapours. The toxicities of representatives of all four major groups of hydrocarbons estimated in this way showed a close inverse relationship with vapour pressure, and there was little difference in toxicity between the groups. As toxicity increased, the ratios between vapour pressure of equitoxic concentrations and saturated vapour pressure (thermodynamic activity) rose, reaching 1.0 with compounds boiling at about 170° C. Compounds of higher boiling-point were non-toxic as vapours. Leaves of a plant resistant to oil spray (parsnip) showed similar relationships; but higher concentrations were needed to cause injury and the 'activity' reached 1.0 at about 140° C. The 'activities' of all compounds tested were between 0.3 and 1.0, suggesting that hydrocarbons act on plants as 'structurally non-specific' substances.

Phytotoxic effects of 'hormone' herbicides on cereal crops were described by Mr. E. B. Scragg, of the North of Scotland College of Agriculture, Aberdeen. If such herbicides were applied while the spikelet primordia were being differentiated, they induced various types of abnormalities in the ears, caused by multiplication or fusion of parts. Application of 'hormone' herbicides after the completion of differentiation of the ear could cause sterility of the florets. In all cereals, the stage of maximum susceptibility was immediately before tillering.

All the species and varieties of cereals tested were susceptible to damage. Of the herbicides in commercial use, the amine salt of 2:4-D (2:4-dichlorophenoxyacetic acid) caused most damage and the sodium salt of 2:4-D least. Methoxone (sodium salt of 2-methyl-4-chlorophenoxyacetic acid) and the *n*-butyl ester of 2:4-D were intermediate in phytotoxicity.

The direct effect of 'hormone' herbicides upon yield was also influenced by time of application. Very early applications had in some experiments given considerable reductions in yield. In other experiments, there had been no reduction, despite the presence of a high proportion of abnormal ears. Late applications, by causing infertility of the florets, decreased yield.

Increase in grain size and in crude protein content had sometimes been found in sprayed crops. Viability of the grain did not appear to be impaired.

### Systemic Fungicides

The chairman for the afternoon session, on systemic fungicides, was Mr. R. W. Marsh, president of the Association of Applied Biologists. The symposium was introduced by Prof. R. L. Wain, of Wye College, who directed attention to the modern successes in animal chemotherapy which had led to a renewed interest in the possibility of controlling plant diseases by introducing curative chemicals into the plant. This technique had been employed in the United States by Horsfall and Howard, who had obtained encouraging results, using various unrelated chemicals against systemic diseases such as the various wilts, for which other methods of control were not available.

In Britain, Crowdy and Wain, studying compounds which might be translocated in plants, found systemic fungicidal activity in certain aryloxyalkylcarboxylic acids. Brian *et al.* demonstrated the marked systemic fungicidal properties of griseofulvin, an antibiotic which might be present in soil.