

Aberdeen Meeting of the British Association

THE full programme of the Aberdeen meeting of the British Association, to be held on September 5-12, should be now or shortly in the hands of members known to be attending. The programme itself forms only part of an unusually large bulk of literature issued in advance, for the local committee has prepared a handbook containing full details of all the local arrangements, descriptions of the general excursions, and so forth. Should any members find themselves apt to lose their way through all this mass of preliminary information, there is no need for them to do so, if by using the summary time-table of the meeting they are able to decide what they wish to do with the opportunities offered; there are cross-references in the time-table to the appropriate pages in the handbook. The Scientific Survey of the city and district, also issued in advance, has expanded somewhat beyond the lines laid down in recent years, and may be thought to deal with one or two subjects outside the scientific scope; but its interest never fails, and these surveys, in the course of years, ought to grow into an extraordinarily valuable series. They have certainly no equivalent in other readily accessible form.

Sir James Jeans announces the subject of his presidential address as the "New World-Picture of Modern Physics". The evening discourse which, as stated in the Preliminary Programme, is intended as a memorial lecture for the late president, Sir William Hardy, is now set out as a lecture on the "Storage and Transport of Food", by Sir Frank Smith; and no subject, nor any lecturer, could be more appropriate to the dedication of the discourse. The other evening discourse will be given by Prof. W. L. Bragg on the "Exploration of the Mineral World by X-rays".

It is common knowledge that there has arisen a widespread demand, of recent years, that the Association should secure more effective communication between science and the public, on the general subject of the relations between science and the welfare of the community. On the side of science there is some measure of feeling (whether due to modesty, concentration, or aloofness) against any overt action in this matter on the part of the Association. This view, however, does not appear to be held by many, nor does it seem justified if the Association is to carry out the objects prescribed by its founders, one of which is to obtain more general attention for the objects of science. As for the public demand, there will not be at Aberdeen any set general discussion of this topic; on the other hand, the public is offered a fuller opportunity than ever of appreciating specific applications of science to its welfare and interest.

It is too seldom recognised that the Association, as the principal mouthpiece between science and the public, always presents in its programmes a

series of subjects of public interest: if the Aberdeen programme does not make this evident, none ever will. The title of Sir Frank Smith's discourse, already quoted, is a sufficiently good starting-point. Among the sectional presidents' addresses we find those of Prof. F. G. Baily on sources of cheap electric power; Mr. H. T. Tizard on science at the universities—problems of the present and future; Prof. H. M. Hallsworth on the future of rail transport; Dr. Shepherd Dawson on psychology and social problems; Prof. J. A. S. Watson on scientific progress and economic planning in relation to agriculture and rural life. Among the subjects of discussions or papers in the sections—taken almost at random—there are economic planning, town planning, water supply (a full discussion on underground water), the reduction of noise, the preservation of food, the chemistry of milk, nutrition in relation to disease, the application of soil and ecological studies to problems of land utilisation for forestry and grazing.

These may suffice for examples; there are many others. If subjects of this sort are judged to need further investigation by means of committees, the Association has the mechanism to set such investigation on foot. In fact, action has been taken already in relation to some of the above. The recent inquiry by the Association into the desirability of a survey of inland water resources is well known; the outcome (if any) of the representations made last month to the Government by the Association and the Institution of Civil Engineers is awaited with interest. What may have been almost forgotten is the work of the Association's committee, which from 1875 to 1895 sedulously collected data concerning underground water supplies, and, in the manner of that time, scattered its published results through the successive annual reports, in which they are interred. The committee's recommendations in 1895 were not dissimilar, so far as they went, from those which have been made now. The discussion on noise to be held at Aberdeen follows upon the previous ventilation of this subject in the engineering section: a practical outcome is promised in a demonstration, on behalf of the Association's committee on noise, of the successful modification of a motor bicycle's din. The subject of town and country planning is occupying the attention of more than one section and also of the delegates of the Corresponding Societies, which have lately been afforded, through the Association, an opportunity of indicating to planning authorities any scientific interests which may endorse arguments for the preservation of particular sites.

Aberdeen commands so wide an area of country necessarily so seldom accessible to the Association as such, that very full opportunities are offering for excursions and work in the field. The geological, geographical, botanical, agricultural and anthropological sections will be even more active

than usual outside their meeting-rooms, and the engineering section, among other visits, contemplates one after the meeting to the important hydro-electric works in the west of Scotland. It is not apparent from the programme that the zoological section is as yet concerning itself with the fauna of Loch Ness; but it will find special interests both in land excursions and in the fisheries. The important research institutions in the vicinity of Aberdeen will receive close attention from the sections interested (see NATURE, Aug. 18, p. 258). The general (as distinct from sectional) excursions (see NATURE, July 21, p. 110) are lavishly arranged, and it is hoped that as many members as possible will help the vigorous local organisation by indicating in advance, on the form provided, the excursions in which they wish to take part. The hospitality of the city and the

university has proved itself already, and members will not fail to show their appreciation of it.

It is impossible here to enter into fuller details of the programme, but one point may be added. There is a tradition in the Association that Scottish meetings are always 'good' meetings. As a matter of fact the present writer, in a number of years' experience, has never been actively conscious of a 'bad' meeting, though there may have been degrees of goodness. But there is apt to be at Scottish meetings a certain special quality of enthusiasm, both among local scientific workers who take part in the arrangements and in the programme, and about the audience recruited from interested local residents. The article in last week's issue of NATURE affords sufficient evidence that the Aberdeen meeting will not fall short of this standard.

Morphology and Biochemistry

By DR. JOSEPH NEEDHAM, Caius College, Cambridge

THOSE who are accustomed to ponder the ultimate problems of biology are aware that though the need for a comprehensive biological science is great, the difficulties in obtaining it are equally considerable. Such old antitheses as that of form and function need not, indeed, detain us, for as Woodger's analysis¹ made clear, form is simply a short temporal slice of a single spatiotemporal entity. The main difficulty which confronts the biologist concerns the fusion of the two great realms of morphology and biochemistry or biophysics. Because at the present day the biochemist has little enough to offer towards the solution of the problem of the maintenance of organic form, the morphologist is apt to suppose that no connexions exist, and to acquiesce in an acceptance of the ancient Aristotelian distinction between *materia* and *forma*. This, however, is a counsel of despair.

In much physiological thought of the past there was a tendency to forget altogether about the problem of organic form and to treat the reactions proceeding in the body as though they took place in some homogeneous medium. The rise of colloid science almost acted as a lightning conductor for these minds by allowing them to salute heterogeneity at one level while forgetting it at the higher ones. But the advance of biochemistry itself has demonstrated that organisation must be taken into account. The significant observation of Vlès and Gex² that the ultra-violet spectrometric curve of the intact echinoderm egg is not that characteristic of proteins though these substances make up by far the largest part of the solid present, and the equally significant finding of Pollack³ that picric acid, a notable coagulating agent of proteins *in vitro*, produced no effect when micro-injected into the cell, pointed the way towards new conceptions. The work of Peters⁴ on the effect of adsorption on the dissociation constants of fatty acids, and

much other experimentation referred to in his Harben lectures bore in the same direction; and recent investigations⁵ of the cell-free extracts of muscle and yeast have indicated the formation of stabilisation products among the phosphoric esters which probably play little or no part in the normal processes of the living cell. Such facts as these do not throw doubt on the value of studying *in vitro* processes, they simply show the need for caution in their interpretation.

For the union of biophysics with morphology the situation is, however, not entirely hopeless. It must be always borne in mind that form persists down to the level of organic molecules, and is clearly possessed, for example, by 'crystals' of protein. The possibilities of studying the orientation of these have not so far been explored. The technique of X-ray analysis which has been so successful⁷ in the case of hair and wool, and promises such interesting results with muscle, has not yet been applied to the proteins of the egg-cell. How illuminating might not such an analysis be, when applied to the cell-bridges which Moore⁸ has shown to exist between the cells of the gastrulating echinoderm embryo, or to the primitive connective tissue fibres which are believed by Weiss⁹ to guide the growth of cells later arising? Again, the possibility exists that the origin of dextrality and sinistrality exhibited by certain molluscan eggs in their cleavage¹⁰ may be found in the stereochemical properties of the protein molecules composing them. Finally, we must probably assume that some oriented space-lattice of protein molecules is involved in the polarity which, as Conklin¹¹ and Wintrebert¹² describe, persists and determines cleavage after the movable ballast of the egg is shifted from place to place by centrifugation; and although as yet we know nothing of the way in which the primary organiser works in the amphibian egg, it is at least not