

an inland region dependent on adjacent mountains and lakes for its water. Methodical irrigation might yet reclaim much that in the near future will be absorbed into desert.

S. CASSON.

#### THE BRITISH ASSOCIATION AND SCIENTIFIC RESEARCH.

THE valuable work done for science by the research committees of the British Association is well known in the scientific world, but few people outside are familiar with its nature, extent, or influence. It is not commonly understood that all members of such committees render their services without fee of any kind, or even receive travelling expenses to attend meetings; indeed, as a general rule, a member not only gives his time and knowledge freely, but also adds somewhat to his personal expenditure. The association makes grants of a few pounds annually to some of the research committees, but others are without grants; and in many cases the chairmen and secretaries meet the necessary expenses out of their own pockets.

The committees thus represent at its highest and best united work for the promotion of natural knowledge, and their constitution could not well be improved. The subjects and members are put forward by the various sections of the association, and any grants desired have to pass the scrutiny of the Committee of Recommendations, which is made up of representatives of all the sections. The organisation is, in fact, one in which men of science themselves decide upon subjects of research, and allocate the slender funds at their disposal to aid selected inquiries and reports. Obviously, this system is both efficient and economical, and its general adoption would be in the best interests of progressive knowledge.

The amount of money which the association can allocate as grants in aid is, however, only about 1000*l.* per annum, and this has to be shared between thirty or more research committees. As other funds are now available for scientific research, it has been suggested that the association should limit its aid to committees to the payment of secretarial and like expenses, instead of attempting to provide for actual investigations by the small grants it is able to afford.

The work of the research committees has, however, been of such high value throughout the existence of the association that no one would wish to make any change which would diminish its importance; and there is not the slightest doubt that whatever funds the association has available for research will be usefully applied. The present position is clearly stated in the sub-joined communication from Prof. John Perry, treasurer of the association, being mainly remarks made by him before an evening discourse on September 11 at the recent Bournemouth meeting of the association. No general appeal is made for funds, but it is to be hoped that wealthy benefactors will follow the example of Sir James Caird and others interested

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in the promotion of scientific knowledge, for no more effective machinery for attaining this end could be devised than that provided by the British Association committees.

"You are aware that, after paying printing and office expenses, the funds of the British Association are devoted to scientific research. For more than eighty years we have spent more than 1000*l.* a year on research, long before ordinary people had heard of research.

"Every year we form many research committees; each of them is formed of the foremost men of science of Great Britain, who receive none of the money themselves, and their accounts for mere out-of-pocket expenses are carefully audited. These researches in the past have created some entirely new sciences, have led directly and indirectly to the creation of many new industries, and they have largely produced the world's present natural knowledge. And now to my point. Yesterday a very prominent member of the association asked me about our finances. I had to admit that even before the war we were meeting with difficulties due to the increased cost of printing and other things, that since the war we have been behindhand to the extent of more than 1000*l.* every year, and that we have never yet asked for the help of moneyed men. The only gift we have ever received from a moneyed man was a voluntary gift from Sir James Caird, who handed me 11,000*l.* at the Dundee meeting. My questioner said we ought to ask for help, and that he was willing to start a fund with a sum of 1000*l.* At this moment he does not wish to have his name mentioned.

"I need not dwell on the importance of our research work, as I feel sure that every person here who has himself done original work shares my opinion that when we limit our expenditure on research, and especially on pure scientific research, we shall begin to be a bankrupt association—bankrupt, that is, morally from the point of view of science, if not actually in the financial sense.

"The moneyed men of Great Britain are most willing to help any good object when they get proof that it really is a good object. We cannot complain of want of their help, for they did not know the facts. At the same time, the treasurer of an association with such a record as ours does not feel happy at the prospect of begging for help."

In the two days of the meeting following that on which I made this statement, the fund was raised to a total of 1475*l.* I intend to publish in due course a list of names of donors and donations.

To illustrate by many instances (as I might) our claims as to the importance of our researches would unduly prolong this letter, and any selection of a few examples would be unrepresentative. I will cite a single illustration:—The National Physical Laboratory, the scene of researches of which the importance to the nation during the war and earlier cannot be overestimated, had its origin (if its antecedents be traced backward) in the Kew Observatory, which was maintained by the British Association from 1842 to 1872, in which period the association spent some 12,000*l.* on its upkeep.

DR. JOHN AITKEN, F.R.S.

DR. JOHN AITKEN, widely known for his unique researches in meteorology, died at Ardenlea, Falkirk, on Friday, November 14, at the ripe age of eighty years. Although he served his apprenticeship as a marine engineer, Dr. Aitken's intellectual interests drew him into the fields of

physical research, for which he received a stimulus as a student under Sir William Thomson (Lord Kelvin) in Glasgow University. He lived a retired life in Falkirk in a house which was largely fitted up as a laboratory, whence he would emerge from time to time to communicate some novel experiment or observation to the Royal Society of Edinburgh. Dr. Aitken frequently visited the Continent, partly for his health's sake, and never failed to utilise his opportunities in studying at first hand the varied meteorological conditions of our globe. He published scientific papers in the *Philosophical Magazine* and through the publications of the Royal Societies of London and Edinburgh, but it was mainly through the latter society that his important investigations were laid before the scientific world.

In his classical memoir on dust, fog, and clouds (1880) Dr. Aitken broke entirely new ground, and by his later paper on dew (1885) he consolidated his reputation as a natural philosopher of the first rank. Those who were privileged to see his demonstrations before the Royal Society of Edinburgh in 1880 can never forget the effective simplicity of his apparatus and the clearness of the argument by which he established the great truth that invisible dust particles are the nuclei on which water vapour condenses to form mist, fog, and cloud in all their infinite variety. By successive slight exhaustions of saturated air in a glass receiver, and by infiltration through cotton-wool of ordinary air from the outside, he gradually cleared it of dust particles; and when this purification had been effected, expansion with cooling of the enclosed air was, in general, unaccompanied by the formation of cloudy condensation. He noted, however, in these early experiments, that after the air had been thus purified of dust particles, a more rapid and somewhat greater expansion was sometimes accompanied by cloudy condensation. The explanation of this was afterwards given by Mr. C. T. R. Wilson, who showed that in dustless saturated air suddenly expanded electric ions acted as nuclei on which drops of water were deposited. This ionic condensation requires a distinctly greater diminution of pressure than is needed to effect the cloudy condensation in ordinary unfiltered air, and in his last paper on the subject of cloudy condensation (Proceedings R.S.E., 1917) Dr. Aitken gave many experimental illustrations of his belief that under ordinary atmospheric conditions the nuclei on which fog, mists, and clouds form are fundamentally the dust particles, although the effect may be occasionally intensified by the presence of ions.

Dr. Aitken followed up his main investigations in many ingenious ways, inventing, for example, an instrument for counting the number of particles in a given specimen of air, and applying it to the study of the conditions under which the number of dust particles varied according to locality, wind, barometric pressure, or time of day. In all these discussions he displayed unusual powers of accurate observation, great skill in devising crucial

experiments, and singular gifts in interpreting natural phenomena. His researches led him into questions of colour in cloud, sky, and sea, and into the dynamical laws of cyclones and anti-cyclones. In this last branch of meteorology he found himself at variance with other leading meteorologists. Dr. Aitken was elected a fellow of the Royal Society of Edinburgh in 1875, and of the Royal Society of London in 1889. By the former he was awarded the Keith medal and prize (1886), and the Gunning jubilee prize (1895), and by the latter a Royal medal in 1917. In 1899 he received the degree of Doctor of Laws from Glasgow University. He was a lovable personality and of great modesty of disposition. Much though his many friends desired it, he would never allow himself to be nominated for high office in the Royal Society of Edinburgh. This, he maintained, was not his *forte*. He was a humble student of natural phenomena, and his one desire was to elucidate the workings of Nature in her everyday moods.

C. G. K.

#### NOTES.

THE Electricity (Supply) Bill, which passed the report stage in the House of Commons on Tuesday, is a laudable attempt by the Government at constructive economy. In almost every business, combination and standardisation lead to great economies, and this applies in a very special manner to the supply of electricity. An attempt was made on Monday to prove that the Bill in its present form was a breach of the agreement made in the Act of 1888 whereby a term of forty-two years was granted to the companies to carry on their supply without Government interference. This is perhaps technically right, but the companies have no real grievance. The Bill leaves their distributing business undisturbed, and guarantees to supply them with electricity as cheaply as they could generate it for themselves. Lord Moulton and others have laid great stress on the economy, from the point of view of the conservation of coal, of using gas for heating instead of electricity. Many electrical engineers will agree with this view. But although electrical supply companies will provide energy for heating—generally at prohibitive rates—when they are specially asked, they regard the heating load as of minor importance. Electrical heating forms only one of the manifold uses of electricity. Every engineer knows that cheap power is essential to many of our most important industries. Our supremacy as a commercial nation depends on a plentiful supply being available. A cheap and abundant supply would soon effect an industrial revolution, and be a special boon to the manual workers. Another objection that has been urged against the Bill is the danger of strikes. If a national system of supply were adopted, and if the electric workers went on strike, the work of the nation could be held up at any moment and the nation forced to grant the demands of the workers, however unreasonable they were. The experience gained by the workers, however, during the recent railway strike ought to discourage similar action against the community in the future.

UNDER a Bill introduced by the Government last week, power is given to the Board of Trade to safeguard "key" industries in this country by prohibiting the importation of certain articles. Of chief scientific interest among these are analytical reagents, photo-