

The History of the British Association.

BY JOHN MILLS.



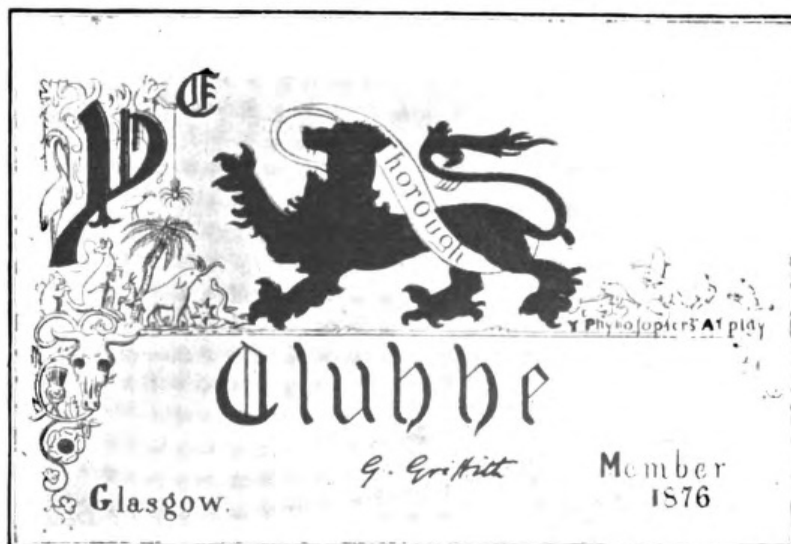
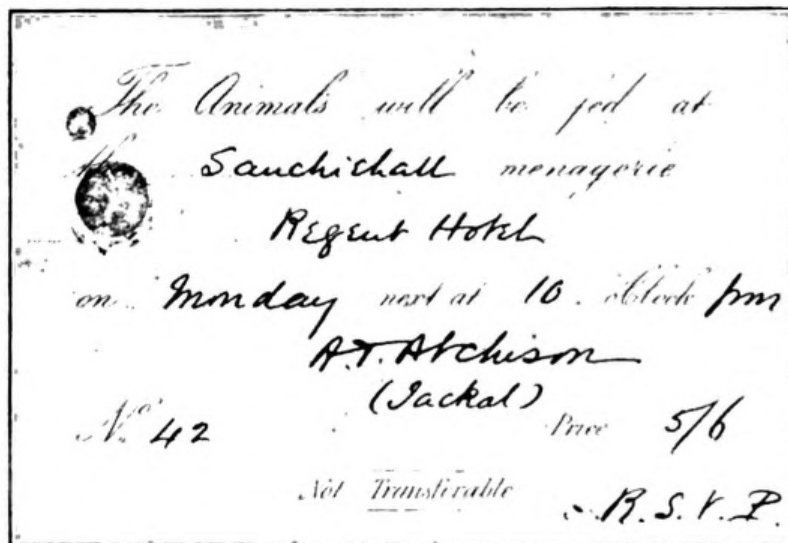
ON the eleventh day of the current month there will be a great concentration of leading men of science in the City of Glasgow. Chemists, physicists, mathematicians, astronomers, naturalists, geographers, explorers, engineers, economists, and other specialists in every branch of human knowledge will, for one free and easy week, quit the usual routes of research and sit down together by the River Clyde, not to weep, but to cheerfully present to each other, to the world, and to posterity the fruits which they have individually gleaned in the scientific vineyard during the last twelve months.

It is interesting to note, in passing, that among the members of the Association there is a combination called the Red Lion Club. It was founded by the late Edward Forbes and others, and a dinner generally takes place at the meeting. The members of the club are called Lions, and the President the Lion King. New members are known as cubs, and the arrangements are in the hands of two jackals, or the lions' providers. "The great feature is the discourse of the senior jackal, illustrated with diagrams, repetitions of experiments, and so forth, in which the errors, scientific and other, in the various presidential addresses and the chief papers of the meeting are pointed out, and suggestions suited to the character of the club thrown out. Manifestations of applause are usually made by roaring, though it is regarded as a breach of etiquette for a cub to do more than wag his coat-tail, and if he offends against this rule

he is liable to be called to order by the Lion King and removed." A ticket of invitation to the club is here reproduced.

The Association is not a secret confraternity of men jealously guarding the mysteries of their profession. It invites the public at large to share its advantages, having as one of its objects to break down those imaginary and hurtful barriers which exist between men of science and so-called men of practice.

Just now, while preparations are in progress for the great meeting in Glasgow, it is opportune to glance at the origin, aims, and history of the Association, and to point out its use to the general public. I may



BACK AND FRONT OF INVITATION CARD OF THE RED LION CLUB.

say at the outset that His Majesty's subjects are equivalent to shareholders in a gigantic co-operative movement, in which the members of the British Association form the Board of Directors, and every man, woman, and child, though ignorant of the fact, receives regular and substantial dividends, increasing year by year as time rolls on. The Association has been and is an unseen body of far-sighted men working down in the foundations of social structures; strengthening the hands of statesmen in making laws for the public good; suggesting, aiding, and executing schemes for filling the public granaries while we are far advanced down the foreigner's throat, three-fourths of our food supplies coming from abroad; formulating ways and means for raising coal from greater depths at a time when the exhaustion of the upper seams is coming threateningly near; better water supplies to large towns, improved drainage, broader and sounder education for the people; the seeds of these and a thousand other reforms in our everyday life were sown, watered, and the young plants tenderly nursed at the meetings of the British Association.

Probably there is no one alive to-day out of the 325 members who attended the first meeting held at York on Tuesday, 27th of September, 1831, in the Museum of the Yorkshire Philosophical Society, and at which Lord Milton presided. The Rev. W. Vernon Harcourt, father of the Right Hon. Sir William Harcourt, was the virtual founder of the Association. Of a scientific turn of mind, he constructed a laboratory, and, aided by his friends Davy and Wollaston,

occupied himself in chemical analysis. While he was President of the Yorkshire Philosophical Society the following letter from Sir David Brewster was received by the secretary, Professor John Phillips, who acted as Secretary of the Association up to the year 1862, and was President at the Birmingham meeting in 1865:—

Allerly, Melrose, 23rd Feb., 1831.

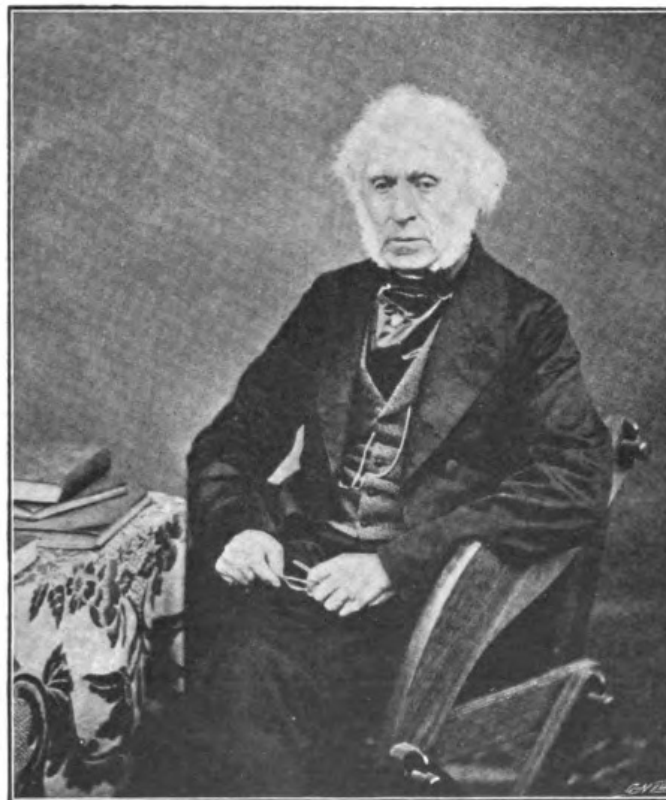
DEAR SIR,—I have taken the liberty of writing to you on a subject of considerable importance. It is proposed to establish a *British Association of Men of Science*, similar to that which has existed for eight years in Germany, and which is now patronized by the most powerful Sovereigns in that part of Europe. The arrangements for the first meeting are now in progress, and it is contemplated that it shall be held

in York, as the most central city of the three kingdoms. My object in writing to you at present is, to beg that you would ascertain if York will furnish the accommodation necessary for so large a meeting, which might perhaps consist of above one hundred individuals; if the Philosophical Society would enter zealously into the plan; and if the Mayor and influential persons in the town and in the vicinity would be likely to promote its objects. The principal objects of the society would be to make the cultivators of science acquainted with each other—to stimulate one another to new exertions; to bring the objects of science before the

public eye, and to take measures for advancing its interests and accelerating its progress. The society would possess no funds, make no collections, and hold no property; the expense of each anniversary meeting being defrayed by the members who are present. As these few observations will enable you to form a general opinion of the object in view, I shall only add that the time of meeting which is likely to be most convenient would be about the 18th or 25th July.—I am, etc.,

D. BREWSTER.

The Rev. W. Vernon Harcourt was a man of great intelligence, great influence in high places, and great energy. He possessed the



SIR DAVID BREWSTER, WHO SUGGESTED THE FORMATION OF THE ASSOCIATION. [Photo.]

necessary resources for effectually helping Brewster to float this grand idea, and at the first meeting he set forth a more fully developed scheme with such skill, foresight, and good judgment, that it has remained practically unchanged to this day.

It was agreed that the Association should employ one week in every year in pointing out lines in which research should move, proposing problems to be answered and calculations to be made, and setting to work in the most useful manner the multitude of humbler labourers in science who were anxious to know how they might direct their studies with the greatest advantage to science in general. Mr. Harcourt then proceeded to read the plan of the Association in several resolutions. It was proposed a "British Association for the Advancement of Science" should be formed to give a stronger impulse and more systematic direction to the efforts of men of science in this country; that members of philosophical societies in the British Empire should become members, by desiring their names to be enrolled and contributing some small subscription; that the Association should meet annually at certain places in rotation.

There were no railways in 1831—at least none which could be of much use in aiding wayfarers to the ancient city of York. One year previous, in 1830, the Manchester and Liverpool line had been opened. Although letters of invitation were sent to all learned societies and all men known to be engaged in scientific work, the founders of the Association were quite prepared for many letters excusing non-attendance on account of distance, loss of time, and expense, and they did not even expect to see at the meeting men living in such far-off places as Cornwall! The means of travel were scanty and dear, available for the most part to the rich alone, and men of science, as a rule, are not rich; and for all ranks travelling then was beset with discomfort and risk. Correspondence by post was a slow business, and communi-

cation by telegraph was a dream of the future.

The birth of the British Association occurred just on the borderland between the England of our grandfathers, so much like the ancient civilizations of Greece and Rome, and the England of our day filled with magic wonders which would perhaps scare them back into their graves could they but see the transformations wrought since 1831. He, therefore, that would see the sun of science rise higher and higher on England's horizon, and witness the growth of the old sciences and germination of the new, must follow the migrations of this Association from town to town and watch the doings of the members. The first paper was read by John Dalton of Manchester, and was entitled "Experiments on the quantity of food taken by a person in health, compared with the quantity of secretions and insensible perspiration." The experiments by Dalton himself. At the very first meeting the Association began that system of reform which has earned for it the title of "The British Parliament of Science." At that time the Patent Laws were a serious impediment to both the progress of science and the free course of industry. It cost about £400 to get a patent through,

and even then it was regarded as of no value until it had sustained a suit at law to establish its novelty. They also sought to reduce the tax on glass, which was so expensive that the manufacture of telescopes was carried on at a prohibitive cost, and in museums glass was too much of a luxury to be used for cases of specimens as we now see them. These museums, by the way, were the objects of much sarcasm in those days, and eminent men spoke contemptuously of "the stuffed ducks, the skeleton in the mahogany case, the starved cat and rat which were found behind a wainscot, the broken potsherd from an old barrow, the tattooed head of the New Zealand chief, the very unpleasant-looking lizards and snakes coiled up in the



THE REV. W. VERNON HARCOURT, THE VIRTUAL
FOUNDER OF THE BRITISH ASSOCIATION.
From a Photo.

spirits of wine, the flintstones and cockle shells."

It is curious to observe the large proportion of clergymen who formed the main body of the Association in its early days, and the almost complete absence of so-called professors of science. Now the order of things is entirely reversed. With the great development of scientific education during the last few decades professors have sprung up like mushrooms, and many of them shine as stars of the first magnitude in these yearly meetings. It is evident that the Association made a profound impression on the captains of industry throughout the land; many employers enrolled themselves as members—machinists, ironfounders, shipbuilders, agriculturists, and others, who recognised in the deliberations of this Parliament of Science the prime mover of progress in all that appertains to the improvement of trade, wholesome living, and intellectual refinement. At York, at Oxford, at Cambridge, in their initial gatherings, we see them in committee with their heads together, endeavouring to fix on some piece of work for the public good.

The tides? Any old salt at Hull, Liverpool, or Portsmouth can tell you one day at what time the tide will be up the next, but the man of Hull would not undertake to perform the part of prophet for Liverpool or Portsmouth. And so our Parliament of Science recognised that if a great number of observations of the ebb and flow of the tides were taken at many different places, accurate tables might be constructed which would render the prediction of the tides as certain as that of eclipses of the sun and moon. The conduct of this most important work was intrusted to the father of Lord Avebury (Sir John Lubbock), and it has been followed up by others, so that now tables are prepared in advance for all important ports in the civilized world.

Oxford University, 1832, at the first meeting of the Association in that city, conferred the degree of Doctor on Faraday, Dalton, Brewster, and Brown. Lord Salisbury, as President of the Association in 1894, again at Oxford, told a story about this incident. He said: "A curious record came to light last year in the interesting biography of Dr. Pusey, which is the posthumous work of Canon Liddon. In it is related the first visit of the Association to Oxford in 1832. Mr. Keble, at that time a leader of University thought, writes indignantly to his friend to complain that the honorary degree of D.C.L.

had been bestowed upon some of the most distinguished members of the Association. 'The Oxford doctors,' he says, 'have truckled sadly to the spirit of the times in receiving the hodge-podge of philosophers as they did!' It is amusing, at this distance of time, to note the names of the hodge-podge of philosophers whose academical distinctions so sorely vexed Mr. Keble's gentle spirit. They were Brown, Brewster, Faraday, and Dalton. When we recollect the lovable and severe character of Keble's nature, and that he was at that particular date probably the man in the University who had the greatest power over other men's minds, we can measure the distance we have traversed since that time, and the rapidity with which the converging paths of these two intellectual luminaries, the University and the Association, have approximated to each other."

Familiarity with railways from earliest childhood has rendered us almost oblivious to the risk of life, and long journeys are now undertaken with scarcely a thought of danger. Lord Francis Egerton, as President of the Association at Manchester in 1842, gave a picture of a different order when Bessel, who measured the distances of some of the stars, visited the Association. "If ever accident is destined to happen on the Birmingham and Grand Junction Railroad," said he, "I hope it may be spared us on an occasion when two such companions as Bessel and Herschel are trusting their lives to its axles. May they convey to us in health and safety the illustrious stranger, the accuracy of whose observations have enabled him to pass the limits of our system and the orbit of Uranus, and to measure and report the parallax and the distance of bodies, which no contrivance of optics can bring sensibly nearer to our vision—and which remain on the mirrors of our most powerful telescopes, the same points of unextended light which they appeared to the Chaldean shepherd."

Lord Brougham takes a more cheerful view, and looks into the future with genuine optimism. "What is it that enables man to move almost with the wings of a dove," he says, "and perform the various operations of business, or amusement, or pleasure, to attend to private affairs, or to public concerns, half-a-dozen times in the course of the day, at distances thirty miles asunder, which in former ages it would have taken a week to accomplish? What is it that makes the distance between Manchester and Liverpool nothing, which will enable us shortly to proceed from Liverpool to Birmingham,

or from Liverpool to London, in eight or ten hours at farthest? What is the power that annihilates, as it were, the space which separates different communities of men—or, walking on the waves, brings the continents buried in the heart of America down to the sea-coast, and civilizes their inhabitants by commerce and intercourse with their fellow-men? Why, it is steam, subdued to the use of man, and made as docile as and a thousand times more powerful than any domestic animal, instead of being the source of terror and dismay by its devastation."

Among the many useful national objects which have been promoted by the physical researches of the British Association there is one which calls for special notice, namely, the proposal of Robert Stephenson to carry an iron tube over the Menai Straits to sustain the great railway to Holyhead. "This bold proposal," said Sir R. Murchison, "could never have been realized if that great engineer had not been acquainted with the progress recently made in the knowledge of the strength of materials, and specially of iron; such knowledge being chiefly due to investigations in which the Association has taken, and is still taking, a conspicuous share, by the devotion of its friends and the employment of its influence." Nevertheless, at this period it was thought necessary to explain at each meeting the character and objects of the Association, and to vindicate it from the denunciations fulminated against it by individuals, and even by parties of men, who held it up as dangerous to religion and subversive of sound principles of theology. Now, so marked is the change in public feeling, that the Association is solicited by

the clergy, no less than by the laity, to hold the meetings within their precincts.

It was to the British Association at Glasgow in 1840 that Baron Liebig first communicated his work on the "Application of Chemistry to Vegetable Philosophy." The philosophical explanation there given of the principles of manuring and cropping gave an immediate impulse to agriculture, and directed attention to the manures which are valuable for their ammonia and mineral ingredients, and especially to guano, of which

in 1840 only a few specimens had appeared in this country. The late Duke of Argyll, as president of the Association, again at Glasgow in 1855, speaking on this subject said, "Chemistry has come in with her aid to do the work of Nature, and as the supply of guano becomes exhausted, limited as its production must be to a few rainless regions of the world, the importance of artificial mineral manures will increase. Already considerable capital is invested in the manufacture of superphosphates of lime, formed by the solution of bones in sulphuric acid, the use of which was first recommended at the last Glasgow meeting. Of these artificial manures



PROFESSOR HUXLEY IN 1860.
From a Photo. by Hills & Saunders, Oxford.

not less than 60,000 tons are annually sold in England alone."

But infallibility is not to be conceded even to the wise men of our Parliament of Science, as will be seen in the case of one of the greatest men of this or of any age—James Prescott Joule. Joule's own account of the general reception of his work is given in a note, dated 1885, to his "Collected Papers." He says: "It was in 1843 that I read a paper on the Caloric Effects of Magnetic Electricity and the Mechanical Value

of Heat to the chemical section of the British Association assembled at Cork. With the exception of some eminent men, including the Earl of Rosse and a few others, the subject did not excite much general attention; so that when I brought it forward again in 1847 the chairman suggested that, as the business of the section pressed, I should not read any paper, but confine myself to a short verbal description of my experiments.

This I endeavoured to do, and, discussion not being invited, the communication would have passed without comment if a young man had not risen in the section and, by his intelligent observations, created a lively interest in the new theory. This young man was William Thomson" (Lord Kelvin). Now Joule's presentment stands on a pedestal.

Professor Schönbein, in addition to his report on ozone, brought to the Association a discovery which has proved to be of vast practical importance. The "gun-cotton" of Schönbein, the powers of which he exhibited to his colleagues, is an explosive substance, which was said to exercise a stronger projectile force than gunpowder, to possess the great advantages over it of producing little or no smoke or noise, and of scarcely soiling fire-arms; "whilst no amount of wet injures the new substance, which is as servicable after being dried as in its first condition. The mere mention of these properties is sufficient to suggest its extraordinary value in warlike affairs, as also in every sort of subterranean blasting." Nitro-glycerine was first exhibited to the

Association by Professor de Vry at Ipswich in 1851.

When it was announced at the meeting of the British Association in 1856 that a paper would be read on a new method of converting cast iron into malleable iron without the use of fuel the intelligence was received by many with a smile of incredulity, and not a few "practical men" went to "Section G" expecting to be entertained by the visionary

schemes of some ingenious but idle enthusiast. Their expectations were utterly falsified. A graceful tribute of admiration was paid by Mr. Nasmyth to Henry Bessemer, who had made one of the greatest discoveries of the age. Mr. Bessemer's workshop was at Baxter House. The result of his experiments was the discovery of a process applicable to the arts of peace no less than to those of war. "It is difficult to assign any limits to the importance of an invention whose influence will



From a]

PROFESSOR TYNDALL IN 1860.

[Photo.

be felt throughout the civilized world in the improved quality and diminished cost of one of the great staples of modern industry." Sir Henry Bessemer not only secured the legitimate reward of his industry and ingenuity by the grants of patent rights in almost every part of Europe, but alive to the greatness of his invention, he resolved to adopt a wise and liberal policy in the grant of licenses, and to place the use of the process within the reach of all persons who might be desirous of availing themselves of its important advantages.

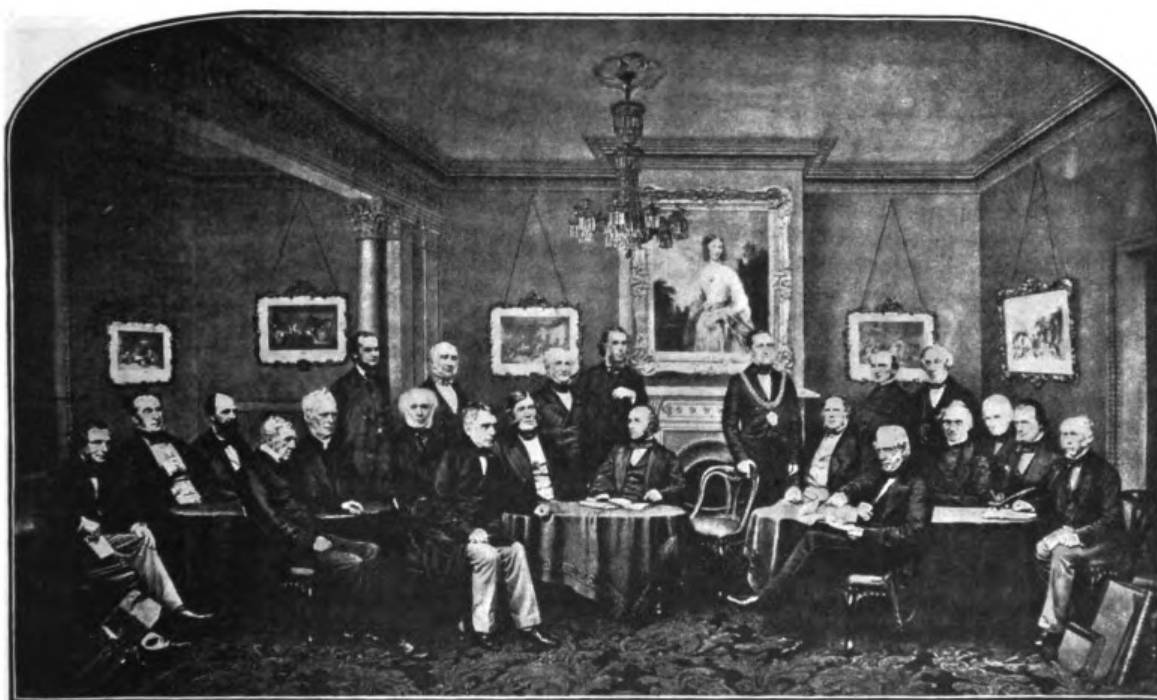
One mode in which the Association has materially aided in the advancement of science is through the instrumentality of its

Observatory at Kew. The objects which have been attained by that important establishment are the trial and improvement of instrumental methods, and especially of those connected with the photographic registration of natural phenomena; the verification of meteorological instruments, and the construction of standard barometers and thermometers; the supervision of apparatus to be employed by scientific travellers, and the instruction of the observers in their use.

Sir William Fairbairn, as President of the mechanical section at Leeds, 1858, speaks as

extent unexplored, field of this wonderful discovery."

A time of intense intellectual warfare now overtook, not only the British Association, but the whole civilized world. The publication of Darwin's revolutionizing works brought to light views on man's origin which made sad havoc of the poetic imaginings of long generations of teachers and spiritual leaders. At the Oxford meeting, in 1860, the late Professor Huxley championed the cause of science in the face of terrible opposition. How the great Darwin himself



THE BRITISH ASSOCIATION AT MANCHESTER, 1861.

From a Photo. by A. Brothers, 14, St. Anne's Square, Manchester.

follows on the completion of the Atlantic Cable: "The consummation of telegraphic communication between the old and new world is the crowning triumph of the age, and I hail in common with every lover of science the immense benefits which the successful laying of the Atlantic cable is calculated to secure for mankind: it is another step forward in the great march of civilization, and the time is not far distant when we shall see individuals as well as nations united in social intercourse through the medium of the slender wire and the electric current. These are blessings which the most sanguine philosophers of the past never dreamed of; they are the realizations of the age in which we live; and I have to congratulate the section on what has already been done in the wide, and to some

found solace may be gathered from this passage: "The astonishment which I felt on first seeing a party of Fuegians on a wild and broken shore will never be forgotten by me, for the reflection at once rushed into my mind — such were our ancestors. These men were absolutely naked and bedaubed with paint, their long hair was tangled, their mouths frothed with excitement, and their expression was wild, startled, and distrustful. They possessed hardly any arts, and, like wild animals, lived on what they could catch; they had no government, and were merciless to everyone not of their own small tribe. . . . For my own part I would as soon be descended from that heroic little monkey who braved his dreaded enemy in order to save the life of

his keeper. . . . as from a savage who delights to torture his enemies, offers up bloody sacrifices, practises infanticide without remorse, treats his wives like slaves, knows no decency, and is haunted by the grossest superstitions."

The famous aeronauts, Glaisher and Coxwell, undertook their thrilling adventures in the air at the request of the British Association, and the expedition of H.M.S. *Challenger* was also born under the same roof. An interesting result of this deep-sea exploration

the tedium of long winter evenings unrelieved by adequate illumination. At present we have no experience of a house-to-house system of illumination on a great scale and in competition with cheap gas; but preparations are already far advanced for trial on an adequate scale in London." Referring to the adventurous spirit of the Association in crossing the Atlantic to hold their meeting, he said: "It is no ordinary meeting of the British Association which I have now the honour of addressing. For



From a]

THE BRITISH ASSOCIATION AT BIRMINGHAM, 1865.

[Photo.

has been to show that the depths of the ocean are no mere barren solitudes, as was until recent years confidently believed, but, on the contrary, present us many remarkable forms of life. We have, however, as yet but thrown here and there a ray of light down into the ocean abysses.

Nor can so short a time sufficient be
To fathom the vast depths of Nature's sea.

Our Parliament of Science has been from the first, and still is, imbued with the spirit of prophecy. Lord Rayleigh, as President when the Association met at Montreal in 1884, said: "Looking forward to the future of electric lighting we have good ground for encouragement. Already the lighting of large passenger ships is an assured success, and one which will be highly appreciated by those travellers who have experienced

more than fifty years the Association has held its autumn gathering in various towns of the United Kingdom, and within those limits there is, I suppose, no place of importance which we have not visited. And now, not satisfied with past successes, we are seeking new worlds to conquer."

Coming nearer still to our own day we find Sir William Crookes in his Presidential address at Bristol looking ahead to the time when food will not be obtainable at any price by dwellers in these islands without the artificial assistance of the chemist. The controversy raised by this remarkable speech obliged Sir William to write a book, "The Wheat Problem," in his own defence, in which he says: "I stated that, under present conditions of needless culture, a scarcity of wheat is within appreciable dis-

tance; that wheat-growing land all over the world is becoming exhausted, and that at some future time—in my opinion not far distant—no available wheat land will be left. But I also pointed out that Nature's resources, properly utilized, are ample. I urged that, instead of being satisfied with an average world-yield of 12·7 bushels an acre, a moderate dressing of chemical manure would pull up the average to 20 bushels—thus postponing the day of dearth to so distant a period that we and our sons and grandsons may legitimately live without undue solicitude for the future. It was far from my intention to create a sensation, or to indulge in a 'cosmic scare.' After considerable study I placed before the public hard and formidable *facts*. I have been assailed with criticism—unfavourable, abusive, suggestive—but, having pondered disputed points, I cannot in any material degree modify my estimates of the future producing capacity of the wheat fields of the globe. . . . I have no wish to be gloomy, and certainly no wish to consider myself infallible. If at the end of another generation of wasteful culture my forecast is invalidated by the *unforeseen*, I cheerfully invite friends and critics to stone me as a false prophet."

The meeting at Dover, September 13, 1899, is memorable because it was the occasion of meeting on both sides of the Channel of the French and English Associations. The meeting of the French on this side at Dover and their reception of our Association at Boulogne are things to be remembered always by those who were privileged to be present on both occasions, when a real Continental embrace took place and Sir Michael Foster kissed the French President on both cheeks.

The meeting to be held at Glasgow a few days hence is likely to be one of the most interesting on record, and, combined with the additional attraction of the great exhibition, unusual numbers will wend their way

northwards in search of health, pleasure, and information. The attendance at Newcastle in 1863 numbered 3,335; at York, in 1881 (the jubilee year of the Association), 2,533; and at Manchester in 1887, 3,838. These numbers will probably be far exceeded this year. The President-elect is Professor Arthur William Rücker, late of the Royal College of Science, South Kensington, and now President of the London University, a gentleman who has won great distinction in the domain of mathematical and physical science. Visitors are assisted by an index in the reception-room to inform the passer-

by what paper in each section is at the time in course of reading or discussion. Telephonic communication also is established between the several sections and the reception-room for the convenience of members. Sometimes the proceedings are enlivened by warm controversy, and passages of arms between intellectual giants are now and then afforded to the great joy and admiration of the pigmies. There will be abundant hospitality for those who are lucky enough to find it: receptions, dinners, smoking

concerts, excursions to places of interest in the neighbourhood, popular lectures for visitors, reinforced by a large contingent of residents in the place—residents who would probably not go any long distance to attend, but among whom a fruitful spirit of inquiry is often awakened by the circumstances in which the objects, methods, and advantages of science are brought home to their doors. The more abstruse papers and addresses which furnish the natural food of some of the sections are pleasantly lightened; in others, by histories of the adventures and observations of great travellers, or by dissertations which are not without bearing upon moot points of contemporary politics. Other forms of entertainment are provided for those—and they are many—who regard the annual British Association meeting as a gigantic picnic.



PROFESSOR RÜCKER, PRESIDENT-ELECT OF THE BRITISH ASSOCIATION, 1901.

From a Photo. by George Neumes, Limited.