

eastwards or westwards as the case might be would have to be considered in connection with one another.

"From what has been said it is obvious that in the intrasolstitial temples the list of available bright stars and constellations is in the first instance limited to those which lie within a few degrees of the ecliptic, and it will be found that in the list above given and those which follow, if we omit Eleusis, where the conditions were exceptional, all but one of the stars are found in the zodiacal constellations. A very great limit is imposed in the second place by one of the conditions being the heliacal rising or setting of those stars from which the selection has to be made. So that when both these combined limitations are taken into account it becomes improbable to the greatest degree that in every instance of intrasolstitial temples of early foundation of which I have accurate particulars, being twenty-eight in number and varying in their orientation from 21° N. to 18° 25' S. of the true east. There should be found a bright heliacal star or constellation in the right position at dates not in themselves improbable unless the temples had been so oriented as to secure this combination.

"I have just been looking into the number of possible stars which could have been used, *i.e.* within the limits of the greatest distance from the ecliptic that could have been utilised.

"The stars which could have been utilised in addition to the seven which serve for nearly thirty temples are ten only, *viz.* :—

Aldebaran.	β Libræ.
Pollux.	α Libræ.
β Arietis.	α Leonis.
β Tauri.	γ Leonis.
α and β Capricorni as a group.	β Leonis.

"If the orientations had been placed at random would not our thirty temples have made many misses in aiming at these seventeen stars, it being necessary also to hit exactly the heliacal margin? And would they have secured anything like a due archæological sequence?"

"Another point is this :—

"Whenever a star less than first magnitude is used (Pleiades only excepted) it has been necessary to secure coincidence to give it several more degrees of sun depression than in the cases of Spica and Antares."] "

BRITISH ASSOCIATION MEETING.

FURTHER information is now to hand as to the scientific work which has been arranged for the approaching meeting of the Association at Nottingham.

In Section A two papers have been received on "Physics Teaching in Schools." G. H. Bryan contributes an interesting paper on "The Moon's Atmosphere and the Kinetic Theory of Gases," showing that every planet must be throwing off some of its atmosphere on the kinetic theory, though at an exceedingly slow rate in the case of the larger bodies. Prof. J. J. Thomson will exhibit and explain a new form of air-pump, which will be of interest to sections A and B. Prof. Viriamu Jones is sending a paper on "Standards of Low Electrical Resistance."

As reported by Prof. Emerson Reynolds on p. 416, Section B has been most fortunate in securing a promise from M. Moissan to describe and demonstrate the preparation and properties of fluorine. This will probably have the effect of inducing chemists from all parts of this country to visit Nottingham, as the demonstration has never yet been made in this country, and is of almost unique importance and interest. It is anticipated that M. Moissan's communication will be put down for Monday, September 18, and will probably include the exhibition of his artificial diamonds. Prof. Percy Frank-

land will introduce the discussion on "Bacteriology in its Chemical Aspects" on Friday, 15, and amongst other papers will be one by J. T. Wood, on "A New Bran Bacterium." Tuesday, 19, will probably be mainly devoted to the discussion of "Colliery Explosions," introduced by Prof. H. B. Dixon, one of H.M. Commissioners. On this day further communications on flame researches are also expected. The President's address is put down for twelve o'clock on Thursday, September 14; it will deal essentially with "The Comparative Chemistry of the Elements," specially treating of carbon and silicon, and of silico-organic researches; showing further that it is possible in the light of recent knowledge to fill in some details of the chemical history of the earth. Dr. Phookan has promised a description of his recent researches on the "Rate of Evaporation of Bodies in Different Atmospheres."

In Section C Prof. Hull will read a paper "On the Water-supply of Nottingham"; Mr. Walcot Gibson, one on "The Geology of British East Africa"; Prof. Brögger will describe "The Eruptive Rocks of the Christiania District"; E. T. Newton, "The Trias Reptiles"; Prof. Sollas, "The Carlingford Rocks" and "Glendalough Amphibolite"; R. M. Deeley, "The Drifts of the Trent Valley"; and Prof. Iddings, of Chicago, "The Petrology of a Dissected Volcano." Amongst other papers already promised are the following :—"The Gypsum Deposits of Nottinghamshire," by A. T. Metcalfe; "Derbyshire Toadstone," by H. A. Bemrose; "Mollusca from the English Trias," by R. B. Newton; "Transported Mass of Chalk in Boulder-clay of Culworth, in Huntingdonshire," by A. and C. Cameron; "Some Volcanic Rocks of South Pembrokeshire," by F. T. Howard and E. W. Small; "Midland Trias," by Dr. A. Irving; "Limestone Inclusions in the White Sill," by E. T. Garwood.

Two further papers are sent in for Section D—one by Prof. Gilson, of Louvain, on "Cytological Difference in Homologous Organs," and one by G. B. Rothera, on "Some Vegetal Galls and their Inhabitants."

In connection with Section E the exhibition of the 120 pictures painted on an Antarctic sealing expedition by Mr. Burn-Murdoch has been referred to. The discussion on the "Limits between Geography and Geology" will be introduced by Mr. Clements R. Markham, Pres. R.G.S. Mr. Delmar Morgan will summarise our knowledge of Thibet, and Miss Taylor will describe her recent journey in that country. Mrs. Grove will read a paper on the "Islands of Chiloë." Mr. E. G. Ravenstein will give an account of recent African travel; and a large number of other papers are promised, many of which are of more than ordinary interest. The illustration of many of these papers by lantern photographs will be a special feature.

With respect to Sections F and G there is at present nothing further to add to the original statement made a few weeks since.

In Section H Mrs. Grove promises a paper, "The Ethnographic Aspects of Dancing." Prof. Boyd Dawkins, who is now on a visit to Glastonbury, intimates his intention to discuss the scientific bearings of the discoveries made at the lake village in that neighbourhood; and, in order that the members may be better able to understand the structural details of the woodwork exposed in the course of the excavations, Dr. Munro proposes to give an illustrative sketch of the different methods adopted in the construction of lake-dwellings. Hitherto lake-dwelling researches have furnished little evidence of the kind of houses erected on the artificial islands, but during last autumn a crannog was investigated in Argyllshire which has disclosed some remarkable information on this point. The discussion on lake-dwellings is fixed for Sept. 19, and as this important subject has formerly only incidentally come before the Association, the occasion promises to be most instructive to all interested in the early history of Britain. Among the other papers sent to

the section is one by Mr. Romilly Allen on the "Origin and Development of Early Christian Art in Great Britain and Ireland." This paper is to be well illustrated. Indeed, this is the case with most of the archæological papers. Dr. Hildebrand is arranging illustrations of the Swedish antiquities he wishes to compare with our Anglo-Saxon ones, in groups, which are to be printed on sheets and distributed among the audience when he reads his communication.

The information contained in the above paragraphs has been furnished by request by presidents and recorders of sections; possibly further details may be forwarded in time for publication before the meeting.

The promises of exhibits of scientific apparatus, models, diagrams, and photographs in the laboratories of the University College, Nottingham, are now coming in. Scientific novelties are promised for the conversazione at the Castle.

Visitors can obtain on application the usual lists of hotels and lodgings.

FRANK CLOWES.

GEORGE BROOK.

GEORGE BROOK, whose untimely decease on August 12 we have already chronicled, was born on March 17, 1857. He died, therefore, in his thirty-sixth year, apparently from the effects of heat-apoplexy, while on a visit to his wife's family near Newcastle-on-Tyne. On the fatal day he joined a shooting party on the adjacent moor; after a successful expedition and a repast in the shooting-box, he was complaining laughingly of the necessity for early rising on such occasions, when his head fell back and he expired without uttering a sound. He was buried at Benwell Church, Newcastle, where, six years previously, he was married to Fanny, second daughter of Mr. Walter Scott, of Riding Mill. He was educated at the Friends' School, Alderley Edge, and, although he afterwards studied for a couple of years under Prof. Williamson and others at the Owens College, Manchester, he may be said to have been, as a naturalist, mostly self-taught. His earlier years of active life were spent in his father's business at Huddersfield, and he turned the experience thus gained to good account in his after career. His first definite association with scientific work dates from his connection with the recently deceased Mr. J. W. Davis, of Halifax, and others, in the prosecution of biological investigation in the West Riding of Yorkshire. He was in 1884 appointed scientific assistant to the Scottish Fishery Board and lecturer on comparative embryology to the University of Edinburgh. He retired from the first-named office in 1887, leaving as a legacy a series of valuable notes and reports upon the food fishes, but the last-named one he held till death. As an embryologist, he is himself best known for his work upon the origin of the endoderm from the periblast in teleostean fishes, and although not the first to have suggested this, it must be said, in justice to his memory, that certain recent investigators have reverted to his views without according him befitting recognition. His love of experimental marine zoology, and his personal munificence in the interests of pure science, reasserted themselves in 1889, in his attempt to found a lobster hatchery and marine observatory at Loch Buie, Isle of Mull, duly noted in our pages (*NATURE*, vol. xlii. p. 399), and which we know to have involved him in a not inconsiderable loss. He was secretary to the Huddersfield Naturalists' Society, and to the Scottish Microscopical Society, of which he was a founder; he was for three years a vice-president of the Royal Physical Society of Edinburgh, and a member of council of the same, the Linnean Society of London, and the Royal Society of Edinburgh. He had recently joined the Zoological Society, and was but a few months ago appointed

an examiner in Biology to the Royal College of Physicians, Edinburgh. In the year 1889 he rose suddenly into fame as the author of the *Challenger* Report on the Antipatharia. His preliminary paper, dealing (*Proc. R. Soc. Edin.*, vol. xvi. p. 35) with the homologies of the mesenteries in the Antipatharia and the Anthozoa, had apprised the world of the breadth of his inquiry into, and the extent of his knowledge of, this difficult and little understood group; but the preparation, within approximately a year, of that which came to be termed "one of the most praiseworthy" of all the *Challenger* reports, set a seal to his reputation, and exalted him to a foremost position among living Actinologists. In this work he elaborated his important discovery of dimorphism (in Schizopathinæ) by division of a single primitive zooid into three, instead of by specialisation of individual polypes; and at the time of his death he had well-nigh completed an important paper dealing with this and kindred subjects, for which his talented assistant, Mr. Binnie, had prepared a large series of beautiful sections and some elaborate drawings. The thorough and conscientious manner in which he had worked out the Antipatharians of the *Challenger* collection led, in 1890, to his engagement by the Trustees of the British Museum for the arrangement and cataloguing of their very large collection of stony corals; and the present month marks the publication of that which will perhaps rank as his *magnum opus*, viz., the "Catalogue of the Genus Madrepora," a quarto volume of 212 pages, with 35 beautiful plates, mostly from photographs taken by himself. This welcome treatise, which was the first of a projected series dealing with the stony corals, like most of the set to which it belongs that have appeared under Dr. Günther's direction, is, in reality, no catalogue at all, but rather a revisionary monograph, founded upon the study of rich material from world-wide localities, which must furnish a basis for succeeding inquiry into the group with which it deals. None but those who enjoyed the deceased author's personal friendship can form an adequate idea of the labour and expenditure, both of time and capital, which he bestowed upon this volume. It is the practical outcome of the last three years of his life's work. The success with which he dealt with the bewildering difficulties before him may be perhaps sufficiently gauged from its "Introduction," and to what important lines of structural investigation and conclusions the task was leading him, it is obvious from this and his last published paper "On the Affinities of the Genus Madrepora" (*Four. Linn. Soc. Zool.* xxiv. p. 353).

The most striking features in George Brook's personality were his right living and his manly independence, his moral attributes being in every way worthy his mental ones. There can be no question that his capacity to form an independent judgment, and his great powers of organisation, under the influence of his indomitable will, formed the keystone of his successes, and placed him in a position to rise supreme above petty jealousy and the evils begotten of narrow cliquism and over-ambition. His natural inclinations were towards solid work, as will be obvious from his having originally settled down to the study of the Crustacea, but to relinquish it for that of the Corals—a choice which makes his loss a well-nigh irreparable one to British zoologists of the present generation. In addition to the many unfinished works to which we have alluded, he has left behind him at least the material for a reconsideration of the morphology of certain great veins in the Amniota, and for a detailed report upon some of the corals collected by Prof. Haddon in the Torres Strait, which had been placed in his hands. Indeed, almost his last words to the writer of this notice were expressive of a desire to "get on" with the latter. His final act, as a zoologist, was the determination of a Collemboloid (upon which group he was an authority) for his friend Prof. W. A. Herdman,