

ilies and genera, and the most important results verified. The experiments upon medusæ were confined to the genus *Goni-onemus*, members of which from physiological habit loaned themselves quite readily to such work. While the series of experiments have not been completed, enough has been done to establish the capacity of even such specialized forms to regenerate various parts and organs with great readiness, and that both centrifugally and centripetally. Indeed, an apparent capacity for considerable heteromorphism.

22. The President of the Association read the next paper on 'The Penial Structures of the Saurians,' which was printed in abstract in the last number of this JOURNAL.

23. 'The Relationships of the North American Fauna,' was then presented by the chairman of the section, Vice-President Gill, and discussed at length by Prof. E. D. Cope and others. In the course of his remarks the author said: "The question of the extent and relationship of the North American Fauna have been several times discussed recently and very different conclusions deduced. I do not feel inclined to recede from the position taken years ago. It depends upon the reliance which is placed upon a special group whether we are lead to one view or another; for example, if we take the birds alone we may acknowledge the bonds that bind temperate northern America and Eurasia; if we take the lizards, the North American Group is simply an extension of the Southern; if we take the mammals, the reality of an Arctic region may be insisted on. But the acceptance of an Arctic region by no means clears away the difficulties; it rather doubles them, for we have then the task of defining the boundaries between that Arctic region and the North American, on the one hand, and the Eurasiatic, on the other. It seems best then to consider the Arctic lands as neutral territory and to correlate zoogeographical and geographical

data, recognizing the regions admitted by Sclater, Wallace and most other zoogeographers. The most significant evidence in favor of the distinction of the North American and Eurasiatic faunas is furnished by the fishes. Certainly the ichthyologist cannot subscribe to the union of the two into a single Holarctic region."

The Vice-Presidential address, 'On some Points in Nomenclature,' was read Monday p. m. and appears in full in the present number of this JOURNAL.

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#### THE GEOGRAPHICAL SECTION OF THE BRITISH ASSOCIATION.

MEETING in a great commerical center like Liverpool, and in a city which is the seat of a young but vigorous geographical society, it was to be expected that the Geographical Section of the British Association should be neither less active nor less popular than in former years. It may, perhaps, be the case that the large audiences, on several occasions approaching a thousand, were attracted by an unwontedly liberal use of the lantern for illustration, but no single slide was shown which was not either exhibited for the first time, or was not in a very special manner calculated to fix the impression produced by the papers. The Section met on five days, in the course of which 34 communications were made, almost all of them longer than the average of papers read in other sections. Limitation of discussion was therefore inevitable, and several points which might have led to lively debates had to be passed by in silence. There was no lack of variety in the program; indeed, the difficulty was to secure any sort of logical order in the nature of the papers read on a given day. The provisional program which provided for some such order had to be abandoned

on account of the changed plans of authors and the return of so many Arctic expeditions within the month prior to the meeting of the Association. The following brief resumé will serve to indicate the variety and richness of the fare offered in Section E; the papers themselves will in most cases be published in one or other of the British geographical journals.

The President was Major Darwin, one of the Honorary Secretaries of the Royal Geographical Society and son of the great naturalist. Amongst the Vice-Presidents were Sir Erasmus Ommaney, Sir Lambert Playfair, Dr. P. L. Sclater, Mr. John Coles and Mr. E. G. Ravenstein; while Colonel Bailey, Commander Phillips, Mr. H. M. Dickson and Dr. H. R. Mill acted as Secretaries.

Major Darwin's address opened the meeting of the Section, on Thursday, 19th September. He dwelt mainly on the geographical problems involved in the opening up of the interior of tropical Africa to external trade. He was led to consider that parts of tropical Africa in which the average density of population was less than 8 per square mile were unlikely to be of commercial value, and therefore he limited the problem to the study of the best means of communication between regions of higher density of population and the sea. This is practically a question of conjoint systems of waterway and railway, and special attention was given to the various short lines already at work in tropical Africa, and to the larger schemes for longer railways which are now being discussed and commenced. Major Darwin concluded: "All I have attempted to do is briefly to sketch out some of the main geographical problems connected with the opening of central Africa in the immediate future. Such a review is necessarily imperfect, but its very imperfections illustrate the need of more accurate geographical information as to many of the

districts in question. Many blunders may have been made by me in consequence of our inaccurate knowledge, and, from the same cause, many blunders will certainly be made in future by those who have to lay out these routes into the interior. In fact my desire has been to prove that, notwithstanding the vast strides that geography has made in past years in Africa, there is yet an immense amount of valuable work ready for anyone who will undertake it.

"Possibly, in considering this subject, I have been tempted to deviate from the strictly geographical aspect of the case. Where geography begins and where it ends is a question which has been the subject of much dispute. Whether geography should be classed as a separate science or not has been much debated. No doubt it is right to classify scientific work as far as possible; but it is a fatal mistake to attach too much importance to any such classification. Geography is now going through a somewhat critical period in its development, in consequence of the solution of nearly all the great geographical problems that used to stir the imagination of nations; and for this reason such discussions are now specially to the fore. My own humble advice to geographers would be to spend less time in considering what geography is and what it is not; to attack every useful and interesting problem that presents itself for solution; to take every help we can get from every quarter in arriving at our conclusions; and to let the name that our work goes by take care of itself."

Mr. H. S. Cowper followed with a short account of a journey made by him in northern Tripoli, in March 1896, in the course of which he had photographed a number of remarkable megalithic structures, some of them never previously described. The Rev. J. C. Robinson gave an illustrated lecture on the Housa people of the Niger district.

In the afternoon Mr. John Coles exhib-

ited two forms of camera for photographic surveying, and explained the principles of the process, expressing his belief that photography was destined to play a very large part in future surveys, especially for rapidly constructing small scale maps of large areas. Mr. H. N. Dickson spoke on his work now in progress on the oceanography of the North Atlantic; and Dr. H. R. Mill brought forward the scheme for the geographical description of the British Isles which has already been noticed in *SCIENCE*. He stated that the Royal Geographical Society had authorized the compilation of a descriptive memoir of a specimen sheet.

On Friday the proceedings commenced by a paper on old tapestry maps of some English counties contributed by the Rev. W. K. R. Bedford. These maps were woven about the end of the sixteenth century and present many interesting features. Dr. Tempest Anderson described the Altels avalanche of September, 1895, showing a series of slides. Lieutenant Vandeleur gave a careful and valuable description of the remoter parts of Uganda and the country bordering the Upper Nile, where he has recently traveled extensively in the course of his military duties. Dr. F. P. Gulliver, of Harvard, was welcomed as a disciple of the American school of physical geography, and by the aid of a series of lantern-diagrams he gave an interesting account of the coast forms of Dungeness and Romney marsh with deductions as to their origin. In the afternoon Mr. A. Montefiore Brice, Secretary of the Jackson-Harmsworth expedition, gave a full account of the work carried out by Mr. Jackson in Franz Josef Land, which he is determined to thoroughly survey and where he is now spending his third consecutive winter. Slides were shown of the scenery of Franz Josef Land, and of Dr. Nansen and his companion Johansen while the guests of Mr. Jackson.

Mr. Brice announced that Mr. Harmsworth would probably send out two ships next year to attempt to push northward into the sea beyond Franz Josef Land. M. G. F. Scott Elliot discoursed on the influence of climate and vegetation on African civilization, endeavoring to classify and characterize the tribes according to their environment. Mr. Vaughan Cornish completed the day's work by an original memoir of great merit on the character and origin of sand-dunes. He showed the parts played respectively by the wind drifting sand and driving it in showers, by the eddy in the lee of the dune in gouging out the leeward face, and by gravity in reducing to the angle of repose any steeper slopes temporarily produced by wind. He also recognizes negative dunes, hollowed out in sand, which rests on a hard floor, and he draws attention to the homology between sand-dunes formed in the air and sand-banks formed in the water.

On Saturday Mr. A. J. Herbertson showed some monthly rainfall maps of the world, which he is compiling for Bartholomew's great English physical atlas based on Berghaus. The Report of the Committee on African Climatology was read, and Sir James Grant gave a discourse on Canada with special reference to the discoveries of gold in the Dominion.

On Monday several papers of special interest were read. Mr. W. A. L. Fletcher began with a description of the great journey across Tibet from north to south, on which he accompanied Mr. and Mrs. St. George Littledale to the neighborhood of Lhasa. Mr. F. W. Howell and Dr. K. Grossman gave papers on the scenery of the less known parts of Iceland, very finely illustrated by slides of glacial and volcanic land-forms. Mr. G. G. Chisholm read a philosophic paper on the relativity of geographical advantages, in which he showed that at different periods of history, the con-

ditions of physical, economic or political environment which contribute to the prosperity of a place are not necessarily the same. This thesis he supported by a number of striking examples. Mr. Ralph Richardson made some remarks on the various so-called 'Schomburgk lines' which appear on the maps of British Guiana. In the afternoon Sir Martin Conway, who had returned from an expedition to Spitzbergen a few days previously, gave a preliminary account of the first crossing of the southwestern island, and drew a graphic picture of the extraordinary difficulties he had to overcome on account of the slushy nature of the snow and the marshes which covered the valley floors. His companions Dr. J. W. Gregory and Messrs. Garwood and Trevor-Battye had made most important geological, zoological and botanical observations and collections. Mr. H. W. Cave described, with numerous fine photographs, the ruined cities of Ceylon, and Prof. J. Milne gave a paper on earthquakes and sea waves with special reference to recent occurrences in Japan.

The Section met for the last time on Tuesday, September 22d, when, after a paper by Mr. A. E. Fitzgerald (who is about to attempt the ascent of Aconcagua), on his passage of the Southern Alps of New Zealand, General Sir Charles Wilson gave a masterly address on the Egyptian Sudan. He confined himself, of course, to the non-political conditions of the country, and laid stress on the importance of a railway being constructed between the Red Sea and the Nile above the cataracts. The country he looked upon as one with a great future for trade when once a way to the coast has been provided. Mr. A. W. Andrews read a paper on the teaching of geography as the basis of history in schools. From practical experience he stated what could be done if the teacher threw his heart into the work. Mr. E. Odlum, of Vancouver, gave a short

description of the border-lands of British Columbia and Alaska, which acquired a special interest from the presence, on the platform, of the first settler in British Columbia, Mr. John Coles, and the surveyor of the southern boundary line of the province, Sir Charles Wilson. In the afternoon Mr. J. Scott Keltie, who had just returned from Christiania, described the triumphal reception of Dr. Nansen and the crew of the *Fram* in the Norwegian capital, and also gave a brief outline of the course of the expedition, citing Prof. Mohn's high tribute to the unique value of the observations made in the course of it. He pointed out that although Nansen had returned in the *Windward* he had anticipated no greater difficulty in crossing to Spitzbergen than in reaching Franz Josef Land itself. Mr. A. J. Herbertson showed a simple piece of apparatus for illustrating map-projections by means of the shadow cast by a wire hemisphere. Mr. B. V. Darbishire showed a new population-map of South Wales, on which all inhabited houses as well as villages and towns were marked. The proceedings were brought to a close by the reading of an interim report of the Committee on the Teaching of Geography in Schools, and the Section was adjourned until Thursday, 19th August, 1897, in Toronto.

It may be mentioned here that it would be a matter of importance if intimation of any papers on geographical subjects to be offered to the Section next year would be made as early as possible to me at 1 Savile Row, London, W., so that as representative a program as possible may be prepared before the meeting. The meeting is looked forward to as one at which it will be possible for Section E of the British Association to learn much as to the recent advances in geography on the American continent.

HUGH ROBERT MILL.