

SCIENCE

Notes on the Barrows and Bone Caves of Derbyshire. By Rooke Pennington, B.A. LL.B. (Macmillan & Co.)

THE necessity for drawing up descriptive labels for the archaeological portion of the small museum at Castleton led to the construction of the book which has been published under the above title. It is an interesting account of the more important barrows of Derbyshire, and of their contents, so far as these have been collected and examined. The descriptions given by Dr. Pennington of the pre-historic remains found around and preserved in Castleton may be regarded as strictly trustworthy, and this work will furnish an excellent guide to any inquirer who may be desirous of working over this field. The author's speculations must, however, be very cautiously received. He informs us himself that some of his "views on antiquity are sadly heterodox," and he hopes that "the orthodox will look charitably on the errors incidental to science picked up on moor and hill rather than in library and learned society." Every one reading this book must regret that so industrious an explorer and so good an observer, should have failed to render himself familiar with the views entertained by men, who have studied with the utmost caution, all the evidences which have been collected from the buried fragments of distant ages, and who have arrived at conclusions essentially different from those in which he ventures to indulge.

Brazil and the River Plate, 1870-6. By William Hadfield. (Stanford.)

In this volume the author brings together a variety of information regarding the recent progress and present state of the countries treated of by way of supplement to a previous work published by him under a similar title, in 1868. It contains first, a diary of a voyage which he made to Brazil and the River Plate in 1870, and in which he renewed with evident pleasure his acquaintance with towns, places, and persons endeared to him by former acquaintance. So lively was the interest he took in his trip, that he crowds his diary with a multitude of trifling details, of no value whatever, except to himself and his personal friends, and he has left unpunged all the little items of daily news, such as the arrival and departure of steamers, and the gossip of the hour. There is no attempt made at describing the countries visited, for the benefit of the curious or the entertainment of the general reader, the tacit purpose apparently being merely to "post up" the initiated as to the most recent doings of tramway and railway companies, banks, and other enterprises of a commercial nature in these rapidly advancing regions. The Diary, terminating in January, 1871, occupies about half the volume; the other half is taken up by a review of the political, financial, and commercial history of Brazil and of the Republics of the River Plate, from 1870 to 1876. This latter part contains a mass of information, derived from government and other statistics and reports, which will render it valuable to all those who have commercial relations with the eastern parts of South America. The information is not, however, wholly commercial, although never wandering far from subjects which have a distinct bearing on the chances of future enterprise. Thus there are sections devoted respectively to "Railway Development," "The Argentine Republic at the Philadelphia Exhibition," "Brazilian Debt and Finances," "Brazil and the Vatican," "Banking Institutions in the River Plate," "The Republic of Uruguay," "The Amazon Valley and its Commercial Future," "Telegraphic Communication with Brazil and the River Plate," "The Mineral Resources of Brazil and the River Plate," "Diplomatic and Consular Relations," "The Rivers of Brazil and Internal Communication." It is to be remarked that the author takes a very favourable view of the financial condition and

prospects of Brazil and the Argentine Confederation.

MR. STANLEY'S LAST EXPLORATIONS.

Trieste, October 19, 1877.

WILL you kindly allow me space for a few lines concerning the two last splendid exploratory feats by Cameron and Stanley? The "Special Commissioner," indeed, nobly aided by his public-spirited private supporters, has just achieved one of those exceptional successes which must be rich in results, as are all geographical achievements of the highest order. The vast cannibal regions, with their desperate tribes who, for so many ages, made the vast central belt of Africa between N. lat. 10° and S. lat. 10°, a hopeless white blank, have at last been stormed. The thin red line threading the forthcoming map will determine the fittest sequence for the future stations—the modern and commercial version of the "Apostles' Street," proposed a third of a century ago by Dr. Krapf. The identity of the Lualaba and the Ikutu ya Kwango being now established, this magnificent sweep of the many-named stream, this enormous segment of a circle extending to N. lat. 2°, this new water-road 1,400 miles long, becomes both a base and an objective for future operations. The old Negroid kingdoms of the Moslem Súdán, Dár-Fór (Darfur), Dár-Fertit, Dár-Wadái, the grave of the martyr Vogel, and the "Takriri" region, extending westward to Bornú, will now readily be connected with the Congo-basin by perpendicular lines, driven from the north southwards. The revival of interest in African geography which has lately distinguished Portugal will presently enable explorers to push from the south northwards. From West Equatorial Africa the future traveller can trend eastwards with a full knowledge of his goal; and his interesting task will be to lay down the limits of the Ogowe-basin, which apparently parts the Congo from the Chadda or Eastern Niger. Stanley's march thus ushers in another and the latest era of modern African discovery, and I venture to hope that no prejudice nor prepossession will be allowed to underrate this pregnant geographical feat of the nineteenth century.

Allow me to note, *en passant*, that I am somewhat scandalized by see English writers already neglecting the name of an honoured Englishman. While noticing the identity of the Lualaba and the Congo, why quote as the "theoretical discoverers" of the fact, Drs. Kiepert and Behm of the *Mittheilungen*? These German gentlemen have certainly understood the market value of self-assertion; but why endorse their pretensions to the injury of Sir R. I. Murchison? Our old President, nearly a score of years ago, was the first to suspect that the Nile of his friend Livingstone, "Croph-i-Mophi" and all, was the Lualaba, that the Lualaba was the Congo, and that the Congo drains Lake Tanganyika.

For some months I have proposed writing to you upon the subject of Cameron's masterly discoveries when a new love, the "Land of Midian," drew me off the old love, Africa, at a moment when the latter offered peculiar charms. Reviewers seem to have agreed not to notice a most important passage in 'Across Africa' (Vol. I. p. 133), probably because it occupied only two modest lines. "We were now crossing," says the traveller, after he had passed the station of Jiwe lá Singa, or rock of soft grass, "THE WATERSHED BETWEEN THE BASIN OF THE RUFUJI AND THOSE OF THE NILE AND CONGO." His map shows distinctly that, setting out from Speke Gulf in the (Victoria) Nyanza, and ascending for some 290 miles its tributary, the Shijiyu river, discovered by Stanley in 1875, thence passing southwards to the Luamberri or western fork, and, finally, reaching the head of the Nyankun Swamp, we find, in S. lat. 5° 2', the very limit of the Nile-basin. It lies between Mgunda Mk'háli, the fiery field (or plantation), and Unyamwezi, the "moon-land"; and the altitude of the plateau, about 4,000 feet above the sea level, suggested the exaggerated *oros*, a snow mountain like Kilima-njaro, in which shape it has been preserved for all ages by Ptolemy. I

need hardly remind you that this great *Wasserscheide* between the Giant of the Egypt and the Giant of Angola, which must provisionally be accepted as the "Caput Nili," was discovered by the expedition led by me between 1856 and 1859; that we were allowed by fate to see the Nile small, a gift not granted, all know, to the ancients, and that at the time and long afterwards we were utterly ignorant of our discovery's worth.

In the *Daily Telegraph* (March 29th, 1877, &c.), regularly forwarded to me by the kindness and courtesy of Mr. Edward Arnold, C.S.I., Stanley ventured, I think unwisely, to propose a "new Nile-source." This was the Kitangule or Kagera river, with its "broad," the Akanyaru water, which he renamed the Upper and Lower Alexandra Nile and the Alexandra Lake. Captains Speke and Grant had already recognized the stream as the most important of the (Victoria) Nyanza influents, without, however, proposing it as the Nile-head. We have read much of late concerning the "sources" versus "reservoirs," and the general opinion seems to be that the former must be sought in the limits of the hydrographic basins which are most distant from the debouchures. But in so doing we must consider, not only the absolute mile-length of the bed and the volume of water which it carries, but also the direction, the symmetry of the axis, and the general conformation of the upper section. Hence the primary river-valley may be inferior in dimensions to the secondary, and we derive the Mississippi from the affluents of the reservoir, Lake Itaska, not from the Missouri-Yellowstone. Lastly, this pragmatical multiplication of sources serves only to bring in the "scoffer," and to justify his sharp and telling sneers at "sensational geography" and "geographical charlatanism."

So much for the Nile source; and now for the Congo's. Cameron's map shows that the district "Taborah, or Kazeh," in my day the headquarters of Arab trade, occupies the western bourn of, perhaps, the mightiest water-parting in the world: To the north-west offsets, the Ngombe (Gombe?) stream, which I described ('Lake Regions,' vol. i. p. 395) as the main drain of the Msene region, the western landscape changing and "disclosing a broad view of admirable fertility." To the west-south-west flows the Wale (Kwále, or partridge?) Nullah, made by Cameron the head waters of the great Sindi stream. Both fall into the Malagarázi; the latter feeds the Tanganyika, and the lake-reservoir swells the Congo *viâ* the Lukuga-Luwwa-Lualaba. Both assume from their birth the generally latitudinal direction of the Congo basin, and both take their rise, as far as we know, nearly a degree further east than the meridian that bisects the Chambeze river. The latter, both in volume of water and in absolute length of the channel, is undoubtedly far greater than the Malagarázi: this, on the other hand, not only begins further to the east, forming a counter-shed to the Nile-source: it makes the Tanganyika bear to the Congo the same relationship which the (Victoria) Nyanza bears to the Nile; and, finally, with regard due to axial direction, it forms the primary Congo-valley, of which the Chambeze would be a secondary feature.

Stanley, we see (*Daily Telegraph*, March 26th, 1877), accepts the Lukuga, Cameron's great "find," as an affluent, but intermitting, and, at times, inflowing; and he consoles the gallant young discoverer by assuring him that, although the Tanganyika has no outlet, as the term is generally understood, the Lukuga will, after some five years (!), form an issue of "great magnitude and real force." I am not yet fully convinced of the incorrectness of my theory, namely, that the Tanganyika, with its brackish bays observed by Livingstone, is dead water during the dries, and a lake with two outlets after the annual rains, a northern to the Mwtúá (Albert) Nyanza, and a western to the Congo—another striking instance, *if true*, of the novelties proverbially supplied by Africa. Stanley and Cameron are both against it; on the other hand, Sir Samuel Baker's solid statements, by no means "fanciful ideas" are equally strong.

It is deeply to be regretted that Signor Romolo Gessi, while circumnavigating (April, 1876) the Mwután, by orders of Col. Gordon, neglected, with true unscientific incuriousness, to land at the southernmost extremity; the hill-range appeared to break there, and the growth of "ambatch" and water-plants was but a sorry obstacle.

One of your contemporaries remarks, "The derivation and the meaning of the word Tanganyika appear never to have been hitherto finally settled"; and upon this point I must join issue with him, with Stanley, and with others who have vexed the subject. That the term was known before my day (1858) is proved by Mr. Cooley's fanciful town Zanganyica, which he placed (1845) to the west of the Tanganyika, and after his time by Mr. Queen (1855). The natives of Ujiji, as well as the Arabs, used the word in conversation with me; and the latter translated it *Majma'at Mayyuh*—anastomosis, meeting-place, or collection of waters. The term, equally expressive and high-sounding, was probably taken from the Kisawabili, in which *ku tanganya*, or dialectically, *ku changanya* means to mix, to join or to meet together; and the Rev. Mr. Wakefield, when wandering in the eastern regions, found a swampy place called "Mtanganyiko." Surely this ought to be enough! But, no; the President of the Royal Geographical Society must get *ku Tanganya-nyika* "to gather water-nuts," a philological abortion, or rather monster. Stanley, who, at any rate, does know Kisawabili, prefers (August 7th, 1876) *Kitanganyika*, or plain-lake, when the feature is distinctly a mountain-lake. He is undoubtedly right in the matter of Riemba, or Livingstone's "Lake Liemba" = Lake-Lake.

In conclusion, allow me energetically to protest against certain opinions lately expressed, e.g., that after the heroic feat of the "Special Commissioner," the African explorer's occupation is gone, and that the travellers of the *Zukunft* will be employed rather "in confirming the results of previous investigation than in making absolutely original researches on a great scale." The first costly step has been taken; the shell of the Congo cocoon has been drilled through. The very heart of the Dark Continent has, it is true, been pierced; but a glance at the regions marked on the map "unexplored," show work, and hard work, at least for the coming generation. *Après cela, le Déluge.*
RICHARD F. BURTON.

MR. D. A. SPALDING.

THE scientific world has sustained a loss by the death, at Rosendael, near Dunkirk, on Wednesday last, of Mr. Douglas Alexander Spalding. Mr. Spalding had made but little show in public, but the work done by him in private, and occasionally recorded in magazine articles and contributions to scientific journals, won for him a reputation in the eyes of such men as Mr. Darwin and Mr. Herbert Spencer. Born only about thirty-three or thirty-four years ago, he was the son of an Aberdeenshire peasant, and his early experiences of life were rough indeed. From doing the commonest field work as a mere child, he rose to be apprenticed to a trade—we believe that of a hatter—and then began to educate himself. With the assistance of a friend, he attended some of the winter classes at Aberdeen University; but while still in his teens circumstances led him to abandon both his trade and the University, and to become a teacher in a school near London. He used that position to prosecute his own studies with great advantage, but by sitting up at night and robbing himself of all ordinary luxuries in order to buy books and other implements of study, he laid the beginnings of the lung disease that has now taken him away so prematurely. After a few years of teaching, he resolved to enter the profession of the law, and, with that object, in due time he obtained his call to the bar as a member of the Middle Temple. But his tastes were always scientific and philosophical rather than legal. His ill-health also compelled him to move about, and, always in the most economical way, he often

wandered through England, Scotland, and France, one of his favourite haunts being Avignon, where he enjoyed the friendship of the late Mr. Mill. Four years ago, when his increasing malady threatened to put a stop to all further work, he accepted the invitation of the late Lord Amberley to become tutor to his children. Travelling frequently, and at other times residing at Chesham, he improved in health, and he obtained leisure for scientific study. This happy arrangement was broken in upon by the death first of Lady Amberley, and then of her husband. Mr. Spalding nursed both of them through their illnesses, and, by the wish of both, was appointed guardian to their children. Proceedings in Chancery were, however, entered upon by Earl Russell to prevent this, on the ground of Mr. Spalding's religious opinions. The latter yielded unwillingly to the solicitations of his friends, who saw that, in his broken state of health, it would be impossible for him to live through a long and complicated law-suit, and he therefore surrendered his trust. Since then he has lived chiefly in France, and he was on the point of quitting Dunkirk for warmer winter quarters when his last illness seized him. For some years past he had made it his special work to study the habits of young animals, particularly chickens and others, reared by himself, with a view to obtaining a clearer apprehension of the laws of instinct and inherited association. His observations were recognized by scientific men, even those who did not adopt all his conclusions, as of extreme value, and the work he has thus done, much of it yet unpublished, is a unique contribution to science. There have been few more zealous explorers of the mysterious borderland of physiology and psychology. Although Mr. Spalding had chiefly limited his inquiries to the inferior orders of animal life, the bearings of his speculations upon the intellectual and physical conditions of human existence were interesting, and often startling. His untimely death deprives the world of a scientific worker who could ill be spared, even in these days of scientific activity. To those who enjoyed his friendship the loss is far greater.

GEOGRAPHICAL NOTES.

THE opening address of the President of the Royal Geographical Society, which will be delivered on Monday week, will be of a more important character than usual. The paper of the evening will be an account of the country of Unyamwezi, supplied by a son-in-law of King Mirambo. The character of this potentate has been much misunderstood, as he has been bitterly maligned by the Arabs. He is, for a savage, a wise statesman as well as a gallant warrior; he hates oppression, is friendly to Europeans, and has invited some missionaries to come and civilize his people.

The Council of the Royal Geographical Society is so well satisfied with the reception accorded to the scientific lectures given last winter under its auspices that it has determined to repeat the experiment. Accordingly Prof. Duncan will lecture 'On the Form of the Main Masses of the Earth'; the Hydrographer, Capt. F. J. Evans, R.N., 'On Terrestrial Magnetism; and, it is expected, Prof. Thielson Dyer, 'On the Geographical Distribution of Plants.'

It is stated that Dr. Rink, of Copenhagen, has received a MS., written in Greenlandish by an Eskimo, Hans Hendrik, and giving an account of his adventures in successive Polar expeditions. This work, which Dr. Rink is about to edit and translate, is likely to prove very interesting, for Hans Hendrik is a man of unusual intelligence, who accompanied Kane in 1853, Hayes in 1860, Hall in 1871, and Nares in 1875, and who consequently has visited Smith's Sound more frequently than any other person living. When Kane's expedition was driven back by the ice, the young Greenlander stayed behind, and married a woman of Smith's Sound. The strangest of all his adventures, perhaps, was that in which he, with his wife and three children, was carried to Newfoundland upon an ice-floe. Dr. Rink proposes to pub-

lish the original Greenlandish, with a translation in Danish or English.

The current number of the *St. James's Magazine* contains the first of a series of papers by Mr. A. J. Duffield, giving an account of his travels in Peru, North America, Australia, and Spain, and which extend over several years. Mr. Duffield was commissioned by the Government of Victoria to introduce the alpaca into that colony, and some interesting particulars of this transaction form part of the first instalment.

The *Geographical Magazine* for November announces that the whole of the Indus river has now been explored. The "missing link" consisted of a stretch of about 120 miles along the course of the river, extending from the north-west of Kashmir to where it rejoined our frontier at Derbent. The region through which this portion of the river lay was absurdly near our frontier, but it has hitherto been as sealed to us as if it had been situated at the Antarctic Pole. We understand that the detailed survey of this interesting piece of work has not yet been received in England.

PROF. NORDENSKIÖLD proposes to make, next summer, an important attempt to explore the northern coast of Siberia from Novaya Zemlya to Behring's Straits. We say important because, with the exception of the Austrian steamer *Tegetthoff*, which never succeeded in getting east of Novaya Zemlya, no properly appointed expedition has ever endeavoured to explore by sea this extensive segment of the Arctic circle. It would be extremely interesting to get the eastern portion of the coast between Taimyr Bay and the delta of the Lena accurately laid down, and for some effort to be made to explore to the north of the Siberian Polar Sea. NordenSKIÖLD's expedition will consist of twenty-two sailors and ice-masters and four scientific gentlemen, and will be provisioned for two years.

SOCIETIES.

QUEKETT MICROSCOPICAL.—Oct. 26—H. Lee, Esq., President, in the chair.—Seven new Members were elected.—Dr. Edmonds gave a description of his new Immersion Paraboloid, and explained its use, and the advantages claimed for it as a means of effecting the dark ground illumination of objects under high magnifying powers, a solution of salts of lead in glycerene being specially recommended as the immersion fluid. The subject was illustrated by drawings of the apparatus, and by specimens of *Amphipleura pellucida* and a Podura scale, exhibited by its means under microscopes in the room. It was pointed out that what had hitherto been regarded as markings on the Podura scale, appeared now to be featherlets or spines growing upon the upper surface.—A discussion followed, in which Mr. Inghen, Dr. Matthews, Mr. Powell, the President, and Dr. Edmunds took part.—The proceedings terminated as usual by a Conversazione.

MEETINGS FOR THE ENSUING WEEK.

- MON. Royal Institution, 2.—General Monthly.
- Society of Engineers, 74.—"Tub Wells," Mr. A. Le Grand.
- Institute of British Architects, 8.
- TUES. Horticultural, 11.—Fruit and Floral Committee. 3.—Election of Fellows.
- Biblical Archaeology, 71.—"Cypriote Inscriptions," Mr. I. H. Hall: "Cypriote inscription now in the Museum of Constantinople," Dr. P. Schroeder.
- Zoological, 8.—Additions to the Society's Menagerie during the Months of June, July, August, and September, the Secretary: "New Reptiles from the Madras Presidency," Lieut.-Col. E. H. Beddome: "Collection of Birds made by Mr. A. H. Everett in the Islands of Luzon, Philippines," the Marquis of Tweeddale: "Further Contribution to the Knowledge of the existing Ziphioid Whales, Genus *Mesoplodon*," Prof. W. H. Flower.
- WED. Microscopical, 8.—Introduction to the Study of Evergreens by the Micro-spectroscope, Mr. T. Palmer.
- THURS. Mathematical, 8.—Annual Meeting; Paper by Prof. Cayley.
- FRI. Astronomical, 8.
- New Shakspere, 8.—"Shakspere's Adaptation of 'King John' from the Original Play," Mr. E. Rose.
- SAT. Botanic, 34.—Election of Fellows.

Science Gossip.

A NEW popular work on science, edited by Dr. Robert Brown, assisted by a staff of eminent writers, will shortly be published in serial form by Messrs. Cassell, Petter & Galpin, under the title of 'Science For All.'

THE conjunction of the two planets whose apparent proximity has been so conspicuous