of printing. With regard to publication, negotiations respecting the proposed album of representative photographs were then in progress. The Erratic Blocks Committee had presented a report, and they were going to publish as much as they could as soon as possible. The Coast Erosion Committee had not sent in a report, though they had plenty of material in hand. The Committee on Type Specimens in Museums was making arrangements for the registration of those specimens, and information was required as to where those specimens were housed.

In Section D, Mr. T. V. Holmes (secretary) read a letter from Dr. Vachell stating that he had come to Nottingham in order to present the Report of the Birds' Eggs Protection Committee that morning, September 16, and regretted he should be unable to stay till the conference on the 19th.

Mr. Slater thought it was high time something was done to protect the eggs of wild birds. Influence might be brought to bear upon boys. He also deprecated the wanton shooting of gulls.

The Chairman stated that the committee had been re-appointed, and that the delegates would in due time receive a final communication on the question.

Mr. Holmes then read a letter from Mr. W. Cole, hon. sec. Essex Field Club, on the maintenance of local museums. Mr. Cole thought that if an annual sum for the maintenance of local museums could be obtained from the Technical Education grants in each county, there would be no great difficulty in obtaining substantial sums towards buildings and fittings. The fear that a museum might not be permanent often kept back subscriptions. Donations, both of money and of specimens, would rapidly come in when once the public felt that the museum would be permanent. And in no way could a portion of the Technical Education grant be better expended than in placing on a satisfactory footing the local museum of the county.

The Chairman hoped that members of the Corresponding Societies would occasionally read papers on the specimens in their local museums, each writer keeping to a certain department. These papers would be catalogued in the societies' list, and brought before the notice of many workers in the same subject elsewhere. They would also be available for reference at headquarters in London.

In Section H, the Chairman commended the Ethnographical Survey (the first report of which had been placed in their hands at the previous meeting) to the attention of the delegates and the societies they represented, and explained in what ways they could assist the committee. Local physical, intellectual and moral characteristics, folk-lore, manners, customs, dialect, and ancient monuments might all be noted by various observers, and the results sent to the Ethnographical Committee. Ancient human remains should be carefully preserved, together with any pottery and implements found with them. If any difficulty occurred with regard to the best mode of making any exploration, information might always be obtained at the Anthropological Institute, 3, Manover Square, London. In some cases he had known pottery and implements had been carefully preserved, and bones thrown away or buried; in others skulls had been kept by the explorer, and the large bones thrown away. The Anthropological Institute was always ready to advise or to send some one down to examine the remains found. It was better to leave barrows, &c., as they were, unless people were prepared to examine them thoroughly and systematically.

After some remarks on a proposed excursion of the delegates, a vote of thanks to the chairman closed the proceedings.

THE GEOLOGICAL SOCIETY OF AMERICA.

THE fifth summer meeting of the Geological Society of America was held at Madison, Wisconsin, on August 15 and 16; vice-presidents J. C. Chamberlain and John J. Stevenson presiding, in the absence of the president, Sir J. W. Dawson.

The popular feature of the meeting was an illustrated lecture in the Assembly Chamber of the Capitol, by Prof. H. F. Reid, on "The Gravels of Glacier Bay, Alaska." The stereopticon views gave quite the best exhibit of this interesting glacial region that has yet been presented.

The papers presented included a description of a new species of *Dimictithys*, a new *Cladodus* from the Cleveland shale, and a remarkable fossil jaw from the Cleveland shale, by Prof. E. W. Claypole, who is carrying on the work begun by the late Prof.

J. S. Newberry on Devonian fossil fishes. The remains described are those of new and remarkable species, one of them showing a degree of specialisation quite surprising for that low horizon. The author even surmised that some of the remains may be amphibian.

Prof. J. J. Stevenson, in his paper on the origin of the Pennsylvania anthracite, seemed to have actually subverted the accepted dogma, that the metamorphosis into anthracite was caused by disturbances of the strata. He showed that the difference between anthracite and bituminous beds is due to circumstances connected with deposition; the former having been laid down rapidly and in thick beds, and having been long under water; they are also earlier than the bituminous beds.

G. Frederick Wright and A. Frederick Wright, in their respective papers on extra-morainic drift in New Jersey, and on the limits of the glacial area of New Jersey, admitted the correctness of Prof. Salisbury's first announcement that these were genuine glacial deposits, though occurring beyond the limits of the glacial area.

Edward H. Williams, Jun., in a paper on South Mountain glaciation, described a similar formation in Pennsylvania, where he found transported Medina sandstone and glacial striation.

The programme also included papers on the study of fossil plants, by J. W. Dawson; the Manganese series of the North-Western States, by C. W. Hall and F. W. Lardeson; on the succession in the Marquette Iron district of Michigan, by C. R. Van Hise; terrestrial subsidence south-east of the American Continent, by J. W. Spencer; evidences of the derivation of the kames, eskers, and moraines of the North American ice-sheet, chiefly from its englacial drift, and the succession of pleistocene formations in the Mississippi and Nielson River basins, by Warren Upham; the cenozoic history of Eastern Virginia and Maryland, by N. H. Darton; the Arkansas coal measures in their relation to the Pacific carboniferous province, by James P. Smith; glaciation of the White Mountains, N.H., by C. H. Hitchcock; dislocation in the strata of the lead and zinc region of Wisconsin, and their relation to the mineral deposits, with some observations upon the origin of the ores, by W. P. Blake; geology of the sand hill region in the Carolinas, by J. H. Holmes; notes of geological exhibits at the World's Fair, by G. N. Williams.

BLEEDING BREAD.

THE phenomenon known in Germany as "Blut im Brode," and to us as bleeding bread, has appeared in this country, to no little dismay of the peaceful inhabitants. The subjects of this visitation are not only bread and biscuit, but also boiled potatoes, rice, and other farinaceous substances, on which red stains appear, which resemble blotches of blood. In former times, before their nature was known, these blood stains created much consternation amongst the superstitious as portents of calamity. The first modern naturalist who described it in scientific terms was Dr. Sette, of Venice, who recorded its appearance in Padua, in 1819, and gave it the name of *Zoogalactina imetrophæa*. In this instance it is stated that "a peasant of Liguara, near Padua, was terrified by the sight of blood stains scattered over some polenta, which had been made and shut up in a cupboard on the previous evening. Next day similar patches appeared on the bread, meat, and other articles of food in the same cupboard. It was naturally regarded as a miracle and warning from heaven, until the case had been submitted to a Paduan naturalist, who easily recognised the presence of a microscopic plant."¹ Subsequently Ehrenberg saw the same production near Berlin, in 1848, and, as usual with him under like circumstances, referred it to the animal kingdom, under the name of *Monas prodigiosa*; but during the same year it occurred in the experience of Dr. Camille Montagne, who saw it on cooked fowls and cauliflower, at Rouen, and it was regarded as an Algid, under the name of *Palmella prodigiosa*. The first definite record of its occurrence in Britain appears to have been in 1853, when H. O. Stephens communicated an account of it to the Bristol Microscopical Society, and submitted specimens to the late Rev. M. J. Berkeley, who declared it to be identical with the organisms described by Ehrenberg and Montagne, but which he regarded as a fungus.

The record of its appearance at Bristol is to the following

¹ Trouessart, "Microbes, &c." London, 1889, p. 126.

effect!—"I observed at table the under surface of a half round of boiled salt beef, cooked the day before, to be specked with several bright carmine-coloured spots, as if the dish in which the meat was placed had contained minute portions of red currant jelly. Suspecting what these might turn out to be, I directed the beef to be placed aside. On examination the next day the spots had spread into patches of a vivid carmine-red stratum of two or more inches in length. With a simple lens the plant appears to consist of a gelatinous substratum of a paler red, bearing an upper layer of a vivid red hue, having an uneven or papillated surface. The microscope shows this stratum to consist of generally globose cells, immersed in, or connected by, mucilaginous or gelatinous matter. The cells vary in size, and contain red endochrome; they seem to consist of a single cell-membrane, and contain a nucleus. Treated with sulpho-iodine they become blue."

As to its place in the organic kingdom, Mr. Stephens was of opinion that it was a *Palmella* closely allied to *Palmella cruenta*, but distinct, the cells or granules of the latter differing from it, not only in their colour but size, being very much smaller than those of *P. prodigiosa*. As to its propagation, he further remarks that it seems to extend itself by elastically spurting a sort of jet or column of red particles, which Berkeley compared to a jet of blood from an artery, and by this method it was suggested that the extraordinary rapidity with which a large surface becomes covered can be explained. The vitality of the cells is not impaired (within a certain time) by desiccation, even at a high temperature, and when dry they retain their germinating powers for a considerable period.

The spherical cells are filled with a reddish oil, which gives to them a peach-blossom tint, and when transferred to raw meat they assume a splendid fuch-sia-colour, resembling spots of blood. The plant is only developed in the dark, and the nitrogen necessary for its nutriment must be derived from the air, especially when developed upon bread. About 1886 an epidemic appearance on the Continent was attributed to this source. Pieces of cooked meat presented a singular carmine-red colouration, and stained vividly the fingers or linen with which they came in contact. These phenomena prevailed regularly for a period of three months. Food cooked over-night was found the next morning covered with red patches, and it then underwent rapid alteration. Coincident with a sudden and considerable fall in the temperature the epidemic ceased, and did not reappear.²

Fresenius records the result of his examination of this organism, in his "Beitrag," to the effect that "he took four boiled potatoes, and placed them in a drawer, having previously rubbed two of them slightly here and there with the red substance. After about twenty-four hours, the two potatoes which had not been rubbed, and which had not been in immediate contact with the other two, were affected with fresh spots of the red substance, whilst the spots upon the two which had been rubbed had increased in extent. The spots showed themselves in the form of irregular groups of blood-red drops of different size, which in some places were distinct, and in others had run into one another. The individual bodies of which the spots consist are mere molecules, their diameter varying from one two-thousandth to one four-thousandth of a line. They are mostly round, occasionally oval, and sometimes slightly constructed in the middle, by way of preparation for increase by division into two small round cells. By far the greater number of them, when brought under the microscope in a drop of water, remain at rest—they lie close together in large numbers; when they are more dispersed in the fluid they have a motion which is not distinguishable from ordinary molecular motion. When the drop of water moves they are carried mechanically over the stage like other molecules, and when this motion ceases they remain at one spot in a sort of quivering state until a fresh current carries them in another direction. If the eye be kept carefully upon a part of the stage where the small bodies are thinly dispersed, it will be observed that they passively follow the current of the water, nor, when the current has become sluggish, or has even altogether ceased, are individual bodies ever seen to detach themselves from the group, and take a contrary direction, which real monads would do with great activity."

The present determination of this organism, according to some, is *Micrococcus prodigiosus*, but according to others it is

Bacillus prodigiosus, and consequently one of the *Schizomycetes*. It has been pointed out that as the temperature rises this *Bacillus* loses its power of forming a pigment, and if it is grown on potato or bread-paste, in an incubator at blood heat, instead of at the temperature of the room, the colour is gradually lost, and the culture no longer smells of herring brine, but the power of forming lactic acid from milk-sugar, with the accompanying precipitation of the casein, is frequently considerably increased; so that it would appear that the energy required for the building-up of the pigment substance was, in this case, diverted into another channel, and lactic acid, and perhaps other substances, are produced in place of the usual pigment.¹

The reappearance of this organism in this country, during the late hot weather, and especially on cooked potatoes, gives interest to its history, and is sufficient apology for these observations.

M. C. COOKE.

FORTHCOMING SCIENTIFIC BOOKS.

THE autumn publishing season has opened with announcements of forthcoming books to suit all requirements. From this year's list we see that many works of high scientific importance are in the press, but the chief feature is the large number of text-books announced. The work of the Technical Instruction Committees of our County Councils has naturally resulted in the preparation of books on various arts and handicrafts, and since the authors of these books are usually well versed in the technicalities of their subjects, it may be presumed that the 'prentice hand will derive benefit from their literary efforts.

The following books are announced by Messrs. MACMILLAN AND CO.:—The Collected Works of Thomas Henry Huxley, F.R.S., in monthly volumes, from October 1. Vol. i. "Methods and Results" (just published); vol. ii. "Darwiniana"; vol. iii. "Science and Education"; vol. iv. "Science and Hebrew Tradition"; vol. v. "Science and Christian Tradition"; vol. vi. "Hume." "Systematic Survey of the Organic Matters," by Drs. G. Schultz and P. Julius, translated and edited, with extensive additions, by Arthur G. Green, Examiner in Coal Tar Products to the City and Guilds of London Institute. "Text-Book of the Diseases of Trees," by Prof. R. Hartig, translated by Dr. R. Somerville, Lecturer on Agriculture at Durham College of Science, with a preface by Prof. H. Marshall Ward, F.R.S., with numerous illustrations. "Methods of Histological Research," for the use of students and physicians, by Dr. C. V. Kahliden, Lecturer in the University of Freiburg, translated by H. Morley Fletcher. "Materials for the Study of Variation in Animals." Part i. "Discontinuous Variation," by William Bateson, Balfour Student and Fellow of St. John's College, Cambridge, illustrated. "Handbook of British Marine Fauna," vol. i. Tunicata, Polyzoa, and Echinodermata, by Prof. W. A. Herdman, F.R.S., with numerous illustrations. "The Romance of the Insect World," by Miss L. N. Badenoch, with illustrations. "A Text-Book of Pathology," systematic and practical, by Prof. D. J. Hamilton, vol. ii. "Handbook of Public Health and Demography," by Edward F. Willoughby, Diploma in State Medicine of the London University, and in Public Health of Cambridge University. "The Practitioner," an index to vols. 1-50 of the *Practitioner*, a journal of therapeutics and public health. The three following volumes have been designed to suit the requirements of the examinations of the Department of Science and Art:—"Organic Chemistry for Beginners," by Dr. G. S. Turpin; "Physiology for Beginners," by J. E. Marr, F.R.S., and Alfred Harker, M.A.; "Physiology for Beginners," by Prof. Michael Foster, F.R.S., and Dr. L. E. Shore. "Geometrical Conic Sections," by Charles Smith. "Geometrical Conic Sections," by Asutosh Mukhopadhyay, Fellow of the University of Calcutta. "Geometrical Conics," Part ii., the Central Conic, by John J. Milne and R. F. Davies. "Elementary Trigonometry," by H. S. Hall, Master of the Army Class, Clifton College, and S. R. Knight. "Sketches in Sport and Natural History," by the late Dr. George Kingsley; "The Beauties of Nature," by the Right Hon. Sir John Lubbock, Bart., F.R.S., new edition without illustrations; "The Theory of Heat," by Thomas Preston, with illustrations; "Researches on the Propagation of Electrical Force," by Prof. Heinrich Hertz, of Bonn, authorised translation by Prof. D. E. Jones, with preface by Lord Kelvin, P.R.S.,

¹ Dr. G. S. Woodhead, "Bacteria and their Products" (1891), p. 9.

¹ H. O. Stephens, on *Palmella prodigiosa* in *Annals of Nat. Hist.* vol. xii. December, 1853.

² *Pharmaceutical Journal*, January 29, 1887, p. 610.