stomach. These are formed of delicate membrane, lined by a layer of secreting-cells so arranged that a central channel is left for the transmission of the bile. The cells are polygonal from mutual pressure, nucleated and nucleolated, often projecting, and giving the tubes a beaded aspect. The bile is apparently composed of oil-globules and many fine dark granules. The entire organ is very tortuous, and closely applied to the alimentary canal.

Minnesota academy of natural sciences.

June 3. — Mr. C. L. Herrick described Spirochona gemmipara Ehr., — an infusorian found parasitic upon the gills, legs, and gill-covers of Gammarus lymnaeus, near the university grounds. The European Spirochona was the subject of an elaborate memoir by Hertwig, and was shown to be one of the most pleasing subjects for the study of the subdivision of the nucleus. Attention was drawn to the fact that the American species of Spirochona seems beyond a doubt identical with the European, while the Gammarus, upon which it lives, is of a different species from that forming its host in Europe. It was not found upon Hyallela or elsewhere. Spirochona Scheutenii Stein is the only other member of the genus, and may not be distinct. —— Mr. Herrick also mentioned the occurrence of another curious protozoan in Minnesota, this form being similar to Ophridium versatile of Ehrenberg. The animal bearing this name is allied to the Vorticellae, and is social; but the colonies adhere to the surface of crystal-clear masses of jelly, which may be as large as one's fist. The individuals are sessile upon the sphere, and are peculiar in the great length of the neck-like anterior part of the body when extended. The American specimen measured 0.16 of a millimetre when quite extended. The width of the peristome is .024 of a millimetre. The species was provisionally called Ophridium problematicum. A third infusorian was described as closely related with Paramoecium, but differing in several interesting particulars from it and its allies. In form, this animal is linear lanceolate (about 0.2 of a millimetre long), tapering posteriorly to an almost acuminate point. Anteriorly is a long vibratile proboscis, or flagellum, which exceeds, when extended, the whole length of the body. The mouth is situated at the base of this proboscis, and opens into a very short infundibulum. The whole surface of the body and proboscis is covered with minute cilia, which are inserted in rows, giving the body a punctate appearance. Longer cilia surround the mouth. The sarcode is transparent, and, aside from a few greenish food-balls, contained only a large number (over a dozen) of oval bodies of a similar character (endoplastules in an unobserved coiled endoplast?) The motions of the animal are very quick, and are occasioned chiefly by the whip-like motions of the proboscis, which is extremely vigorous in movement, and alters its form greatly. Aside from this rapid motion, it can propel itself slowly by means of the cilia covering the entire surface. It is the type of a new genus, and was called Phragelliorhynchus nasutus. —— Rev. L. J. Hange contributed a letter on the vegetable remains of the drift. As a missionary among the Scandinavians and Indians of the north-west for over a quarter of a century, his attention has been called frequently to these remains; and he has over seven hundred specimens of woods, leaves, etc., in his collection. In Minnesota, wood is found at from thirty-five to forty-five feet below the surface: going west into Dakota and Montana, the depth is greater. On the Missouri, above Bismarck, a stump twenty-three feet high and a foot in diameter was struck fifty-nine feet below the surface. Many pines have wood well preserved; others are completely silicified and chalcedonic. Upon many a high point of land in western Dakota one finds a pile of stones, and among them some fine specimens of the silicified wood peculiar to this region. These piles were evidently built by human hands; and the writer suggested that they were built by the Indians as altars or landmarks. —— Rev. Dr. H. C. Hovey related some interesting facts touching the habits of the ant-lion, a colony of which he keeps in his study.

NOTES AND NEWS.

OVER one hundred members of the British association have notified the local committee at Philadelphia of their intention to be present at the meeting of the American association. About seven hundred of the British association are expected at the meeting in Montreal.

— *Nature* states that the arrangements for the meeting of the geological section of the British association are now well advanced.

The International geological congress meets at Berlin in September, and this will prevent many continental geologists from going to Montreal; Dr. Richthofen, however, will probably be present, and will communicate a paper on some comparisons between the geology of China and North America. It is hoped that others may also arrange to come.

Meeting in the typical Laurentian country, it is only to be expected that the archean rocks will receive much attention. Amongst the papers sent or promised are the following: Professor Bonney, on the lithological characters of the archean rocks in Canada and elsewhere; Mr. Frank Adams, on the occurrence of the Norwegian 'apatitbringer' in Canada, with a few notes on the microscopic characters of some Laurentian amphibolites; Dr. T. Sterry Hunt, on the eozoic rocks of North America.

On paleozoic geology and paleontology generally, the following are expected: L. W. Bailey, on the Acadian basin in American geology; E. W. Claypole, the oldest known vertebrates, — an account of some fossils recently discovered in the Silurian rocks of Pennsylvania; J. H. Panton of Winnipeg, geological gleanings from the outcrops of Silurian strata in the Red-River valley, Manitoba. Principal Dawson will give a comparison of the paleozoic floras of North America and Europe, whilst Mr. J. S. Gardner will

deal with the same subject as regards the cretaceo-tertiary floras. Other papers are: G. F. Matthews, on the geological age of the Acadian fauna, and on the primitive conocoryphean; E. Wethered, the structure of English and American coals.

After the azoic and paleozoic rocks of Canada, the drift-deposits are of great interest. The following papers bear on this subject: Mr. A. R. C. Selwyn, on a theory of ice-action in the formation of lake-basins and in the distribution of bowlders in northern latitudes; the Rev. E. Hill, on theories of glaciation; F. Drew, on the thickness of ice in the Himalayan valleys during the glacial period.

Amongst other papers of interest are: Professor Hull (who is not expected to be present), on the geology of Palestine, giving an account of his recent explorations; Prof. T. R. Jones, on the geology of South Africa; W. Whitaker, on the economic value of geological maps, with especial reference to water-supply, illustrated by the survey maps of the chalk area in England. Papers are also promised by Dr. Arch. Geikie, Dr. G. M. Dawson, Prof. V. Ball, Prof. W. Boyd Dawkins, Dr. C. Le Neve Foster, W. Carruthers, H. Bauerman, E. Gilpin of Halifax, N.S., and others.

Several reports will be submitted by committees, or by persons appointed for this purpose at the last meeting of the association (the name mentioned is that of the secretary to the committee, or the reporter): Prof. J. Milne, earthquakes in Japan; W. Cash, fossil plants of Halifax; G. R. Vine, British fossil Polyzoa; Dr. H. W. Crosskey, erratic blocks of England, Wales, and Ireland; Prof. T. R. Jones, fossil Phyllopoda of the paleozoic rocks; C. E. De Rance, underground waters; J. W. Davis, Raygill fissure, Yorkshire; C. E. De Rance and W. Topley, erosion of seacoasts of England and Wales; F. Drew and Prof. A. H. Green, the present state of knowledge respecting the interior of the earth; W. Whitaker, geological record; W. Topley, national geological surveys, and progress of the international geological map of Europe.

The local committee at Montreal is preparing a guide-book to the city and neighborhood, which will contain a geological map. A general geological guide to the dominion will be prepared by the geological survey of Canada.

— We regret to learn, that, at the close of the first year, Williams college relinquished the only American table held at the Naples zoölogical station. It was occupied in the first part of the year by Dr. E. B. Wilson, and, in the latter half, by Prof. S. F. Clarke of the college; who, however, was taken ill soon after reaching Naples, and is not yet fully recovered. Only one applicant for the table appeared for the second year.

— Raoul Pictet writes to the *Journal de Génève* of his first acquaintance with Wurtz, as follows: —

"It was in 1867. I reached Paris with a letter of introduction from Mr. A. de la Rive, I entered the court-yard of the medical school, where was pointed out to me a square room quite poorly lighted, and rather small for the twenty students who narrowly found place there. Mr. Wurtz, in laboratory costume, alert and active, was going from one to the other, and was talking with great animation. One of his favorite scholars was at this moment taking his examination for the fellowship, with what anxiety to know the result.

"I shall never forget the words which Mr. Wurtz with frank cordiality addressed to me: 'You come from one of the masters of science; my laboratory is open to you; there are but twenty places; ah, well! this year there will be twenty-one of us.' Then after having appointed me to a place, and introduced me to Mr. Wilm, his chief attendant, he added, 'By the way, you know, I receive Friday evenings; you will always be welcome; this invitation I never repeat.'

"And in this way the students who were fortunate enough to be near the teacher found in him at the same time a learned professor, a director of their studies, an inspirer of their discussions, a defender of new but logical ideas, and a friendly adviser, an interesting and cheerful converser, a host at enjoyable and easy receptions, happy to please and to be useful to those whom he considered his intellectual family. How can I reproduce here the impression left by the scientific discussions excited in the laboratory by the work of a scholar or by a new discovery! There was an enthusiasm, an impulse, a joy, which we all felt under the direct and spontaneous influence of an instructing friend, a respected master."

— The fifth international hygienic congress will be held at The Hague from the 21st to the 23d of August, under the presidence of the ministers J. Hemskerk and de Beaufort. The work of the congress will be divided into five sections, and lectures will be given from three to four o'clock every afternoon. The principal speakers will be L. Pasteur, on methods of infection; H. Paechiotti of Turin, on the hygiene of the future; Professor Finkelnburg of Bonn, on the influence of the microbe theory; Jules Rochard, on the value of public hygiene; Stephen Smith of New York, on the medical professions in the United States; E. J. Marey of Paris, on useful powers in the forward movement; W. H. Corfield of London, on science and sickness; E. Irélat of Paris, on hygiene in dwellings; J. Crocq of Brussels, on drinking-water. Other lectures will be given by Drs. Koch and Bockh of Berlin. Applications for participation in the congress should be addressed to Professor van Overbeck de Meijer of Utrecht.

— At a late session of the section of physical and experimental science of the Royal society, Mr. G. Johnstone Stoney, late astronomical assistant to the Earl of Rosse, described a form of instrument which had proved very successful in completing the optical adjustment of reflecting-telescopes. The new collimator which he invented as long ago as 1857 was made by Mr. Grubb last autumn, and is a short-focus telescope of two inches aperture and eleven inches long, which, when used, is to be inserted into the eye-piece-holder of the large reflector. A spark between

platinum points is produced in the focus of this instrument by a small Rhumkorff coil; and the light of the spark, emerging from the collimator, is reflected by the small mirror of the Newtonian, and thence to its large mirror. On pushing the collimator-eyepiece and platinum points a little inside the focus, the beam of light will, if every thing is in perfect adjustment, retrace its steps after reflection by the large mirror, and, re-entering the collimator, form an image coincident with the spark; and any want of adjustment is at once betrayed by the image in the field of view of the collimator not being coincident with the spark. Mr. Stoney represented this entire process of completing the adjustment as occupying less than half a minute, and as being so easy of application that he is in the habit of repeating it every time the telescope is turned upon a new object.

— In a lecture, May 23, at the Royal institution of Great Britain, on recent researches on the distances of the fixed stars, and on some future problems in sidereal astronomy, Dr. David Gill, her Majesty's astronomer at the Cape of Good Hope, summarized as follows the late investigations at that place on the parallax of stars in the southern hemisphere: —

Name of star.	Observer.	Parallax.	Years.
α Centauri	G. & E.	0.75″	4.36
Sirius	G. & E.	0.38	8.6
Lacaille 9352 . . .	G.	0.28	11.6
ε Indi	G. & E.	0.22	15
o_2 Eridani	G.	0.17	19
e Eridani	E.	0.14	23
ζ Tucanae	E.	0.06	54
Canopus	E.	Insensible.	–
β Centauri	G.	Insensible.	–

The last column contains the star's distance in light-units, or number of years in which light from the star would reach the earth. The observers are Dr. Gill and Dr. Elkin, now of the Yale college observatory, New Haven.

— Oberlin college, in Ohio, has acquired the botanical collection of Dr. Beardslee of Painesville, containing not far from three thousand species. The main part of the collection consists of the phanerogams of northern Ohio; but it also has many plants from the United States generally, especially sedges, grasses, and willows, with over six hundred species of mosses.

— The New-York *Sun* for June 25 gives an instance of ingenuity on the part of some orioles in Central Park, which, finding the twig on which they were building their nest too weak for its support, fastened it by a long string to the branch above.

— Mr. Arthur R. Hunt read a paper to the Linnean society of London, on June 5, on the influence of wave-currents on the fauna inhabiting shallow seas. The author refers to various physical data, among others quoting Professor Stokes and Mr. T. Stevenson; the latter stating that a current of 0.6819 of a mile per hour will carry forwards fine gravel, and that of 1.3638 will roll along pebbles an inch in diameter. From this and other facts, Mr. Hunt argues that wave-currents do materially influence the marine fauna inhabiting shallow water, not only those of the tidal strand, but likewise those inhabiting the deeper sea-bottom. He adduces instances of animals living among or on rocks, and of those frequenting sand or other deposits, enumerating species of starfish, mollusks, shrimps, crabs, and fish. He says that even the flat fishes (Pleuronectidae) seem to have changed their original forms and habits for the purpose of being able to live in shallow waters agitated by waves. Referring more particularly to species of Cardium, he endeavors to show how, under the influence of wave-currents, the variation of species may be promoted, and even their local extinction brought about.

— Professor Sir William Thomson, of the University of Glasgow, and Prof. E. Frankland, have been elected honorary members of the Academy of sciences, Vienna.

— Professor Ayrton has been formally appointed professor of physics at the Central institution of the City and guilds' institute, London.

— Mr. Carl Pearson has been appointed professor of applied mathematics at the University college, London.

— Professor Edward Hull of the geological survey of Ireland, and his party, sent to Arabia Petraea under the auspices of the Palestine exploration fund, have made a complete traverse of the Wady el Arabah, and constructed a special geological map of this grand valley, as well as a general one of the whole region between the Red Sea and the mountains of Edom and Moab, — the latter on a small scale, thirty miles to the inch, to accompany the personal narrative which is to appear in November next; the former on a larger scale, for the scientific report, which will appear later. The scientific report will be chiefly geological, but will probably contain zoölogical and botanical chapters by Mr. H. C. Hart, and meteorological data by Mr. Lawrence, together with a beautiful hill-shaded map of the Wady el Arabah, constructed by Major Kitchener and his assistants.

— It is proposed to organize, under the auspices of the American social science association, during its next annual session at Saratoga, Sept. 8–12, an American historical association, consisting of professors, teachers, specialists, and others interested in the advancement of history in this country. Arrangements will be made for the presentation of a few original papers, in abstract, at the first meeting of the American historical association, which will be held in Putnam hall, Saratoga, Tuesday, Sept. 9, at four P.M.

— Before the section of physiology of the international medical congress of Copenhagen will be brought the following problems and communications: Professor Hammarsten of Upsala, the mucous substances, and their relation to the albuminoid substances; Prof. R. Norris of Birmingham, and Professor Hayem of Paris, the *rôle* of fugitive corpuscles in the formation of fibrine and coagulation, and the relation

between the hematoblasts of Hayem, the *piastrines* of Bizzozero, and the fugitive disks of the blood of Norris; Professor Dogiel of Kazan, the coagulation of fibrine; Dr. Wooldridge of Cambridge, the coagulation of blood; Professor Worm-Müller of Christiania, the proportion of the number of the red globules of blood to the quantity of haemoglobin and to that of the dry globules; Dr. Otto of Christiania, the latest researches on haemoglobin and methemoglobin; Dr. C. Bohr of Copenhagen, researches to determine the absorption in the dissociation of oxyhaemoglobin; Professor Charles of Cork, the gas found in the secretions, especially the bile; Professor Engelmann of Utrecht, Professor Ranvier of Paris, Professor Merkel of Königsberg, and Professor Retzius of Stockholm, demonstrations to show the structure and changes in form of the muscular fibres and of protoplasm in relation to their physiological function; Professor Heidenhain of Breslau, and Dr. Langley of Cambridge, the modifications of the glandular cells during their activity, and the relation between these modifications and the question of the trophic nerves; Dr. Gaskell of Cambridge, the inhibitory or restrictive actions of nervous force, and the restricting nerves in general; Professor Dogiel of Kazan, the causes of the movements of the heart and of their regulation, and of the condition of the hearts of animals which have died from the effects of various poisons; Professor Kronecker of Berlin, the centre of co-ordination of the movements of the auricles of the heart; Prof. H. Munk of Berlin, the functions of the cortex of the cerebral hemispheres; Professor Mosso of Turin, Professor Marey of Paris, and Dr. François-Franck of Paris, the mechanism of the circulation; Dr. François-Franck of Paris, the experimental pathology of the circulation of the blood by artificial lesions of the heart; Professor Burdon Sanderson of London, and Professor Mosso of Turin, the application of instantaneous photography to physiological researches; Professor Marey of Paris, the application of instantaneous photography to the study of voluntary movements; Professor Hensen of Kiel, and Dr. B. Baginsky of Berlin, the relation between the structure and the function of the labyrinth; Dr. Blix of Upsala, the specific functions of the nerves of the skin; Professor Hensen of Kiel, the question whether the doctrine of heredity is to be included in a course in physiology; Professor Kronecker of Berlin, the present state of the knowledge of deglutition; Dr. Openchowski of Dorpat, the automatic, reflex, and inhibitory motions of the cardia of the stomach; and Prof. P. L. Panum of Copenhagen, the slender intestinal fistule for physiological researches.

— Among recent deaths, we note those of Mr. G. H. Boutigny, the physicist, on the 17th of March, at Paris; Dr. T. A. Moesta, on the 9th of April, at Marburg; Dr. J. Bachmann, professor of geology at Berne, at that place early in April; John Williamson of Louisville, Ky., at the White Sulphur Springs, June 16; Prof. J. H. R. Goeppert, who made a special study of fossil plants, on the 18th of May, at Breslau, in his eighty-fourth year; Don Eulogio Jiminez, a prominent Spanish mathematician, at Madrid; Prof. C. Moesta, formerly director of the observatory at Santiago, Chile, at Dresden, on the 2d of April, at fifty-nine years of age; Professor Schoedler, author of Buch der natur, at Mainz, April 27; and Prof. G. von Boguslawski, editor of the *Annalen der hydrographie*, at Berlin, May 4; Henry Watts, the well-known editor of the Watts Dictionary of chemistry, June 30, in his seventieth year.

— The ethnological sub-commitee at Berlin has again engaged Capt. J. A. Jacobson for a long expedition through Russia and Siberia, and also through the Amur region to the Pacific coast. Capt. Jacobson, who only a few months ago returned from a two and a half years' journey through Alaska and northwest America, whence he brought a collection of eight thousand objects, will start very soon. After he has made this journey, he intends to go to British Columbia, and enter again the service of the animal-merchant, Carl Hagenbeck, at Hamburg, for whom he has made several journeys before, through Lapland, Greenland, and Labrador.

— The annual meeting of the Entomological club of the American association for the advancement of science will be held in a parlor of Hotel Lafayette, Philadelphia, commencing at two P.M., Wednesday, Sept. 3. In accordance with the rules of the club, the meeting is called the day before the opening of the general meeting of the association. Entomologists who desire to read communications are requested to notify, as early as Aug. 15, either Dr. D. S. Kellicott, president, Buffalo, N.Y., or Mr. O. S. Westcott, secretary, Maywood, Ill.

— To increase the interest in the work of the chemical section of the American association, the chairman of the section, Prof. J. W. Langley of Ann Arbor, has suggested that one or more subjects be brought up for special discussion, and, with the hope that others may be suggested by the members, has issued a circular, in which he puts forward the following as probably offering good opportunity for debate: 1°. To what extent is the hypothesis of valence,' or 'atomicity,' of value in explaining chemical reactions? 2°. What is the best initiatory course of work for students entering upon laboratory practice? 3°. What is the best method for determining phosphoric acid? 4°. To what extent is the 'influence of mass' of practical importance in analytical operations? If the choice of a majority of the section falls on one or two topics, Professor Langley will have the titles put upon the Philadelphia announcements.

— As an improvement of the meteorological service on the coast of eastern Asia, a meteorological and astronomical station has been established at Hong-Kong, on the peninsula Kaulun, opposite the city. Hitherto the observatory at Manila warned the port of Hong-Kong when a typhoon approached.