

at the farm. The retailer adds a certain number, the consumer none.

(3) The sediment or "dirt" gains entrance to the milk chiefly at the cowshed. In 86.8 per cent. of the samples examined there was no increase in the sediment when sold by the retailer, but a decrease in 68.8 per cent.

(4) The farmer was responsible for the *Bacillus enteritidis sporogenes* (Klein) in the milk consumed in 66.6 per cent. of the samples. In 11.1 per cent. of the samples these bacilli were added by the retailer or the consumer, while in 22.2 per cent. the source was doubtful.

Various suggestions are made for improving the milk supply, and the imposition of the following standards is advocated:—

(1) A bacterial standard of not more than 50,000 organisms per c.c.

(2) Milk not to contain glucose-fermenting bacteria in less than 1/10 c.c.

(3) A sediment standard (at first) not exceeding 40 volumes per million.

Altogether, this report on the milk supply is one of the most important that has appeared in this country, and should be brought to the notice of all producers and retailers of this important article of diet.

THE WINNIPEG MEETING OF THE BRITISH ASSOCIATION.

WE are now in a position to give some further details about the local arrangements for the British Association meeting in Winnipeg during the last week in August next, and also the provisional programmes of the sections.

The Drill Hall will be used as the reception room. The main floor is 147 feet by 87 feet, so that there is no fear of undue crowding. Arrangements will be made for free access to the Parliament building grounds adjoining.

On the opposite side of Broadway are the University building and grounds. The University is a small and by no means beautiful structure. It resembles, in fact, in size and general style the public elementary schools of the city. But it must be explained that the University at present only teaches scientific subjects. Arts, medicine, and agriculture are taught in "affiliated" colleges which are scattered in various parts of the city. Thus, the classics and modern languages are taught in the four "affiliated" denominational colleges, St. Boniface (Roman Catholic), St. John's (Church of England), Manitoba College (Presbyterian), and Wesley College (Methodist); medicine is taught in the Manitoba Medical College, and agriculture in the Manitoba Agricultural College (Provincial Government) at Tuxedo Park. The University of Manitoba (also a Government institution) has been a teaching institution for five or six years. Founded in 1871 as an examining board, the University itself at present undertakes instruction in mathematics, chemistry, physics, botany, physiology, pathology and bacteriology, and civil and electrical engineering. But chairs in English history and political economy have been recently established, and these new departments will commence work next October. The government and organisation of the University is undoubtedly in an unsatisfactory state, and is, in fact, the subject of a Government Commis-

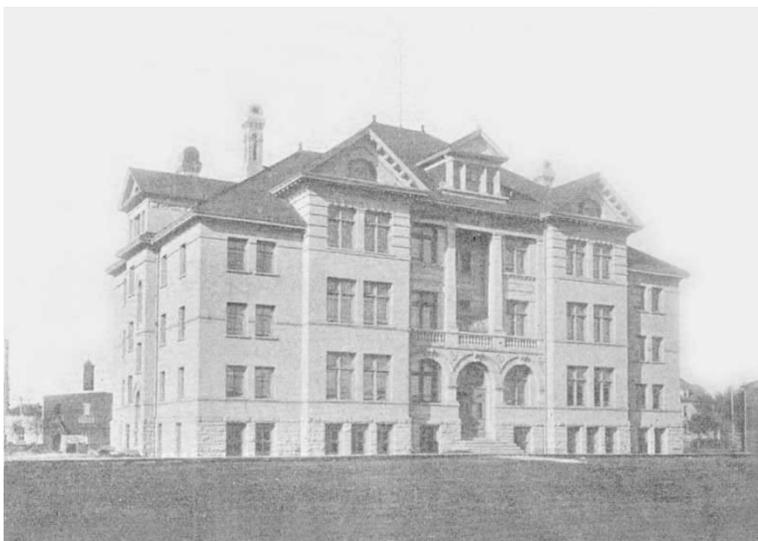
sion at the present time. There is a widespread feeling that the province ought to have a provincial university of the type provided in many States of the Republic to the south, and entirely free from any denominational influences.

Five of the sections (B, D, G, I, K) will meet in the University building. Section A will find its temporary home in Wesley College, where three rooms will be set aside for the meetings. Section E will be placed in the Convocation Hall at Manitoba College, and Section F in a class-room of the same institution.

Section L will have the honour of sitting in the Legislative Chamber of the Provincial Government, while agriculture (subsection of K), and Sections H and C, will meet in the Alexandra, Carlton, and Isbister Schools respectively.

All these meeting places are conveniently near the reception room.

The local sectional secretaries are as follows:—A, Prof. F. Allen, professor of physics, University of Manitoba; B, J. W. Shipley, assistant to the professor of chemistry, University of Manitoba; C, R. T. Hodgson, Brandon Collegiate Institute, Brandon;



University of Manitoba. (For Sections B, D, G, I, and K.)

D, C. A. Baragar, University of Manitoba; E, Alex. McIntyre, Normal School, Winnipeg; F, W. Manahan, Winnipeg; G, Prof. E. Brydone-Jack, professor of civil engineering, University of Manitoba; H, not yet appointed; I, Dr. Wm. Webster, demonstrator of physiology, University of Manitoba; K, Prof. A. H. Reginald Buller, professor of physiology, University of Manitoba; Principal W. J. Black, Manitoba Agricultural College; L, D. M. Duncan, registrar of the University of Manitoba.

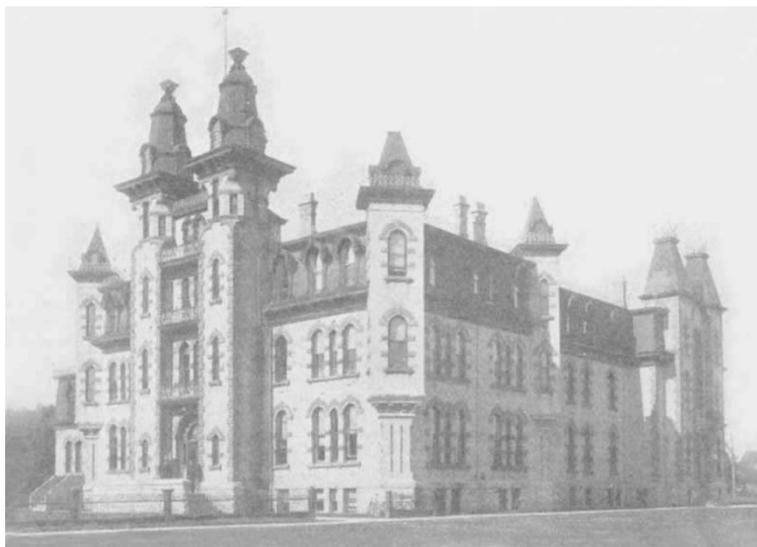
A few hints to travellers may not be out of place. For the ocean voyage, heavy coats and wraps and a travelling rug would be great comforts, if not absolute necessities, as it is never very warm on the North Atlantic route. These, however, should be packed away for the overland journey, otherwise they will give rise to considerable inconvenience.

Travellers from Europe are specially warned not to carry with them in the train more baggage than is absolutely necessary for the journey. Each person ought, indeed, to be content with a suit-case and perhaps a small handbag. All kit-bags, gladstone bags, and such like are quite out of place, as there is no space provided for these, and they may be a great

nuisance to everybody. An elaborate toilet, at any rate, is not possible during the railway journey, but the railway companies' sleeping cars are provided with sufficient lavatory accommodation. Everything except the suit-case and hand baggage should be *checked through* to destination.

To any American, or indeed to anyone who has ever travelled on the North American continent, such advice may seem quite superfluous, but it is rare that one travels across the country or witnesses the departure of train without noticing some Englishman struggling to convey huge piles of luggage into a railway car; he is usually prevented from so doing by the porter, but if he succeeds his belongings soon become a trouble to himself and a nuisance to his fellow-travellers.

In regard to clothing, for Winnipeg during the week of the visit travellers should be provided with the same sort of selection as would be desirable at a meeting in Great Britain. The days in the latter part of August are usually hot, and the nights pleasantly cool. Those undertaking the excursion to the Pacific coast should be provided with some warm clothing for the mountains.



Manitoba College. (For Sections E and F.)

Those intending to visit Winnipeg for the meeting have been provided with postcard forms to fill in, giving various particulars of use to the local committee. These may be obtained from the assistant secretary in London, and should, with any other communications with regard to the meeting, be addressed to the local secretaries, University of Manitoba, Winnipeg.

In connection with the meeting, arrangements have been made by Mr. M. B. Cotsworth, of the Natural History Society of British Columbia, Victoria, B.C., on behalf of some of the members of the Association, to make a trip northward along the Pacific coast from Victoria or Vancouver to Alaska. The journey to Prince Rupert, Skagway, and back occupies ten days, costs about 14*l.*, and may be made either before the meeting at Winnipeg or from September 10 to 19. An extension to Dawson (Klondike) and back brings the total time up to three weeks, and the cost to about 32*l.*, while the round trip from Vancouver to Dawson, thence down the Yukon river to Nome and back by the Bering Sea and Aleutian Islands, occupies about a month, and costs 40*l.* Climatic considerations, how-

ever, make it desirable to carry out such extended trips before the meeting, and it is understood that some members have already arranged to do this. The excursions are not among the official arrangements of the Association, but further particulars may be obtained from the London office, Burlington House, W.

We are informed that Sir Joseph Thomson, in his presidential address to the Association, will touch on the following subjects:—The importance of original research as a means of education; the advantages and disadvantages as a training for work in science of the systems of education now in force in our schools and universities; the light thrown by recent investigation on the nature of electricity; on the relation between matter and æther, and the part played by the æther in modern physics; and a discussion of some problems raised by the discovery of radium.

SECTIONAL PROGRAMMES.

SECTION A (MATHEMATICAL AND PHYSICAL SCIENCE). President, Prof. E. Rutherford, F.R.S.—The arrangements for the meetings of this section are at present very provisional. After the address of the president of the section, the most important items in the provisional programme are two discussions, one on positive electricity, to be opened by Sir J. J. Thomson, F.R.S., and the second on earth tides, to be opened by Prof. A. E. H. Love, F.R.S. The papers promised include the following:—photographs of recent comets, Prof. E. Barnard; new photographs of Jupiter taken at Flagstaff Observatory, Percival Lowell; on sun-spots and magnetic effects, Dr. L. A. Bauer; the structure of the stellar system, G. C. Comstock; the asymptotic expansions of Legendre functions, Dr. J. W. Nicholson; on a continuum expressed as the product of linear factors, W. H. Metzler; luminosity and persistence-of-vision curves, Prof. Frank Allen; variation of the specific heat of mercury at high temperatures, Prof. H. T. Barnes; the effect of temperature-variations on the luminous discharge in gases for low pressures, R. F. Earhart. This list includes only those papers for which definite titles have been received; many others are promised. Friday morning, August 27, will be set aside for papers of interest to chemists, and the section will meet in joint session with Section B (Chemistry).

SECTION B (CHEMISTRY). President, Prof. H. E. Armstrong, F.R.S.—The provisional programme is as follows:—Joint sitting with the Section of Botany and Subsection of Agriculture to discuss "wheat" from several points of view, including requirements of the wheat crop, influence of external conditions, review of the chemical work on strength, the miller's requirements, wheat breeding, the history of the wheat plant, and the economics of the subject. (See programme of the Subsection of Agriculture.) Joint sitting with the Physiology Section to discuss food. Combustion, Prof. W. A. Bone, F.R.S.; chlorophyll, Prof. Willstätter; papers dealing with the physical chemistry of sulphur, Prof. Alex. Smith; (1) rotatory dispersion, (2) the cadmium arc, Dr. T. M. Lowry; (1) mercurous sulphate for standard cells, (2) on the constancy of the hydrogen gas electrode, Dr. C. J. J. Fox. Reports of committees:—(a) hydroaromatic substances; (b) aromatic nitroamines; (c) electroanalysis; (d) dynamic isomerism. This report will be presented in such form as to initiate discussion.

SECTION C (GEOLOGY). President, Dr. A. Smith Woodward, F.R.S.—Dr. Woodward's presidential address will be on the evolution of the vertebrates. There will be reports of research committees on:—the erratic blocks of

the British Isles, Dr. A. R. Dwerryhouse; the fauna and flora of the Trias of the British Isles, which will be supplemented by an account of the progress of this investigation, illustrated by lantern slides, H. C. Beasley; and the fossiliferous drift deposits of Kirmington, Lincolnshire, and the East Riding of Yorkshire. This is the final report of the Committee. The papers will include:—the composition and origin of the crystalline rocks of Anglesea, E. Greenly; the faunal succession in the Carboniferous Limestone of the British Isles, Dr. A. Vaughan, which will be supplemented by an account of the progress of these researches, illustrated by lantern slides, by Prof. Sidney H. Reynolds, of Bristol; critical sections in the Palæozoic rocks of Wales and the west of England, W. G. Fearnside; the microscopical and chemical composition of Charnwood Rocks, Prof. T. T. Groom; the igneous and associated rocks of Glensaul and Lough Nafvey areas, co. Galway, Prof. S. H. Reynolds; geological photographs, with illustrations of British scenery in relation to geology, Prof. S. H. Reynolds; the Glacial Lake Agassiz, Prof. Warren Upham; the advances in the knowledge of the glacial geology of South Wales, Dr. Aubrey Strahan; unconformities in limestone and their contemporaneous pipes and swallow-holes, E. E. L. Dixon; on new faunal horizons in the Bristol coalfield, Herbert Bolton; on the Permian succession in the north of England, Dr. D. Woollacot; a mineralogical paper, A. Hutchinson. Prof. J. W. Gregory, F.R.S., and Dr. Tempest Anderson are now making extended tours in Australia and the South Seas, and it is expected that they will have valuable and interesting communications to make to the section. An extended tour for four days has been arranged to the mining districts of Corall and Sudbury, under the direction of Prof. W. G. Miller, and Dr. J. W. Spencer will lead a party to Niagara and the glacial outlet of Lake Erie.

SECTION E (GEOGRAPHY). President, Sir Duncan Johnston, K.C.M.G.—The following are among the papers to be brought before the section:—some characteristics of the Canadian Rockies, A. O. Wheeler; the evolution of wheat culture in North America, Prof. A. P. Brigham; water routes from Lake Superior to the west, Lawrence J. Burpee; Yellowhead Pass and Mt. Robson, the highest point in the Canadian Rockies, Prof. A. P. Coleman; the influence of traffic or transportation upon the framework of cities, with an introductory reference to the influence of geography in the same direction, G. E. Hooker; the cycle of Alpine glaciation, Prof. W. H. Hobbs; the teaching of geography in secondary schools in America, Prof. R. E. Dodge (to be read at a joint meeting with Section L); the formation of arroyos in the south-west of the United States, Prof. Dodge; the development of Nantasket Beach, near Boston, Mass., Prof. D. W. Johnson; floods in the great interior valley of America, Miss Luella A. Owen; the precious metals as a geographical factor in the settlement and development of towns in the United States, Prof. Hubbard. Mr. J. Stanley Gardiner, F.R.S., will give a lecture, illustrated by lantern slides, on his work in the Seychelles, and there will probably be papers also by Prof. Goode, Dr. C. H. Lecte, and Prof. Hoke.

SECTION G (ENGINEERING). President, Sir W. H. White, K.C.B., F.R.S.—In addition to Sir W. H. White's presidential address, a report will be presented by the committee on gas explosions, and a paper on the same subject will be contributed by Mr. Dugald Clerk. Other papers are as follows:—Skimming boats, Sir John Thornycroft; the Isthmian Canal, Col. Goethals; the work of the International Electrotechnical Commission, Ormond Higman; torsion tests on materials, C. E. Larrard; dielectric stress in three-phase cables, Prof. W. M. Thornton. Papers on grain handling and transportation in Western Canada, on the navigation of the St. Lawrence, and on high-tension overhead lines are in preparation.

SECTION K (BOTANY). President, Lieut.-Colonel D. Prain, F.R.S.—The following are some of the communications to be brought before the section:—On *Thallophyta*: On the production, liberation, and dispersion of the spores of Hymenomycetes, Prof. Buller; numerical determinations of the bacteria in the air of Winnipeg, Prof. Buller and Mr. Lowe; the nuclear phenomena of Ascomycetes in

relation to heredity, Miss H. C. I. Fraser; the nucleus of the yeast plant, H. Wager, F.R.S., and Miss Peniston; some problems connected with the life-history of *Trichodiscus elegans*, Miss E. J. Welsford. *Ecological papers*: The fundamental causes of succession among plant associations, Prof. H. C. Cowles; some observations on *Spiraea Ulmaria*, Prof. Yapp. *Other papers*: A paper on the anatomy of the Osmundaceæ, Prof. Gwynne-Vaughan; (1) the evolution of the inflorescence, (2) the rubber industry, J. Parkin. The annual semi-popular lecture will be given by Mr. Harold Wager, F.R.S., on the perception of light in plants. In addition to the above, there will be a *joint sitting with Section B and the Agricultural Subsection of K* for a discussion on "wheat." Dr. O. Stapf, F.R.S., will contribute a paper towards this discussion, on the systematic history of wheat. Several other papers have been promised by prominent American botanists, but the titles are not yet to hand.

SUBSECTION K (AGRICULTURE). President, Major P. G. Craigie, C.B.—*Joint meetings*: (1) With the Economic Section, Thursday afternoon, August 26. The future possibilities of extending the food production of Canada, Prof. Mavor. (2) With the Chemical and Botanical Sections, Monday morning, August 30. Subject, wheat problems. Papers:—the miller's requirements; a review of recent chemical work on the strength of wheat, Dr. E. F. Armstrong; factors determining the yield of wheat, A. D. Hall, F.R.S., and Dr. E. J. Russell; milling properties of certain Canadian wheats, Prof. R. Harcourt; Canadian wheats, F. T. Shutt; wheat breeding in Canada, C. E. Saunders. Papers also by Dr. W. Saunders and by C. A. Zavitz. *Ordinary meetings*: Presidential address, Major Craigie; methods of crop reporting in different countries, E. W. Godfrey; the experimental farm system in Canada, Dr. W. Saunders; the fruit industry of British Columbia, R. W. Palmer. *Prairie soil problems*: Geography of the prairie soils, R. W. Brock; chemical characteristics of the prairie soils, F. T. Shutt; soil moisture and crop production, Prof. F. H. King; soil moisture as related to dry farming, Prof. F. J. Alway. Papers by A. D. Hall, F.R.S., and Dr. E. J. Russell. *Live-stock problems*: Paper by Prof. W. Somerville; the evolution of a breed of cattle, Prof. J. Wilson; some special features of the Danish system of cattle breeding, P. A. Morkeberg; paper by J. G. Rutherford. *Forestry problems*: Paper by Prof. W. Somerville; Canadian forest resources, R. H. Campbell; the insect pest problem, Prof. Lochhead; some forestry problems of the great plains of North America, C. E. Bessey.

SECTION L (EDUCATIONAL SCIENCE). President, Dr. H. B. Gray.—After the president's address on August 26 a discussion on moral instruction in schools will be opened by Prof. L. P. Jacks, editor of the *Hibbert Journal*. He will be followed by Mr. Hugh Richardson, and it is hoped that American and Canadian educationists will also take part. On Friday, August 27, there will be a discussion on practical work in schools, which will be opened on behalf of the subcommittee of the association which is now considering the question by Mr. W. M. Heller. Dr. C. W. Kimmins will contribute some account of the London trades schools, Miss Lilian J. Clarke will speak on practical work in girls' secondary schools, and Mr. W. Hewitt on practical work in evening and continuation schools. On Monday, August 30, there will be a joint meeting with the Geographical Section of the association for the discussion of geography teaching. Prof. R. E. Dodge, of Columbia, and Mr. G. G. Chisholm, of Edinburgh, are expected to open the discussion. There will also be a discussion on the relations of universities and secondary schools, with special reference to the accrediting and examining systems. On August 31 the president of the section will open a discussion on education as a preparation for agricultural life, with special reference to Canadian conditions. Should time permit, it is also intended to discuss the subject of consolidation schools. The organising committee of the section is in correspondence with educationists in Canada and America, and it is hoped to arrange that each subject shall be opened by representatives of American, Canadian, and British education.