

known even in Russia for about two years, although several notices of its medicinal properties have been contributed to the Caucasian Medical Society. The knowledge and spreading use of this new drink in Russia dates apparently from an investigation and paper read on this new ferment product by E. Kern at the Moscow meeting of the Imperial Naturalists' Society in 1881.

Kephir is prepared by fermenting milk, either sheep's, goats', or cows' milk, with what are termed kephir-grains, the process taking place in leather bottles (*Burdinks*). These grains are the ferment proper, the leather bottle not being supposed to be absolutely necessary. During the fermentation the milk becomes very much changed, and at the same time there is a reproduction of the ferment substance or kephir-grains, which is removed after a certain stage of fermentation has been reached, and after drying in the sun may be preserved, and serves again to effect the fermentation process. Nothing is known of the origin of this peculiar ferment. An analysis of the grains dried at 100° C. gave:—

Water	...	...	...	...	11.21
Fats	...	...	...	...	3.99
Soluble pepton substances	...	...	...	...	10.98
Proteids soluble in ammonia	...	...	...	...	10.32
" " potash	...	...	...	...	30.39
Insoluble	...	...	...	...	33.11

The insoluble residue exhibited under the microscope an intimate mixture of yeast-cells, and the *Bacterium dispora caucasica* with a few *Leptothrix* and *Oidium lactis* possibly as accidental. This 33.11 per cent. of insoluble matter seems to be the only active part of the kephir grains. On preparing some kephir in bottles with this, the product became slightly effervescent after twenty-four hours, and contained a small amount of alcohol. After three days the amount of alcohol and carbonic acid was much increased. On making an examination of the fermented liquid after one, two, and three days respectively, the quantity of casein found was practically the same in each case. But on treating the casein so obtained with dilute ammonia and then dilute potash solution, in no case was there a complete solution. An amount of insoluble residue was obtained from the *third-day* experiment of .22 per cent. of the casein, and which consisted entirely of yeast-cells. From this is concluded that the fermentation of the milk is entirely due to *Saccharomyces mycoderma*, the *Bacterium dispora caucasica* not taking any part in the fermentation, and this seems to be further supported by the fact that the "finished" drinkable kephir will start fermentation in fresh milk in the same manner as the kephir-grains.

The *Bacterium "dispora"* which Kern noticed, and to the action of which he ascribed the peculiar properties of kephir, probably results, in quite a secondary manner, from the employment by the people in the Caucasus of the old leather of the bottles in which kephir has been fermented. In this process in leather bottles the yeast-cells are in contact with the leather, and to some extent possibly grow or extend into it, so that they become modified physically, and the rapidity of fermentation is much lessened. Any animal tissue which has become, as it were, saturated or penetrated by yeast-cells is capable of causing sugar solutions and also milk to ferment, and can therefore be used in place of these kephir-grains for the preparation of kephir.

HENRY WATTS, F.R.S.

WE regret to announce the death of Mr. Henry Watts, F.R.S., the well-known chemist; he died on June 30, of syncope from failure of the heart's action, after a very short illness.

Henry Watts was born in London on January 20, 1815. He was educated first at a private school in

London, and subsequently attended lectures at the University College, London. In 1841 he graduated as Bachelor of Arts in the University of London. In 1846 he entered the Birkbeck Laboratory of Chemistry, then recently established at University College, as assistant to his highly valued friend, the late Prof. Fownes, and in that capacity was engaged in directing the work of the students till the death of Prof. Fownes in 1849, and afterwards till 1857 under Prof. Williamson. In 1848 he was engaged by the Cavendish Society to prepare a translation, with additions, of the great "Handbuch der Chemie" of Leopold Gmelin, a work which extended to eighteen volumes, and occupied a large portion of his time for more than twenty years, the last volume and the index having been published in 1872.

In 1858 he began to prepare a new edition of "Ure's Dictionary of Chemistry and Mineralogy"; but finding that this book, the last edition of which appeared in 1831, had fallen too much behind the existing state of chemistry to be made the groundwork of a dictionary adapted to the requirements of the time, he undertook, with the consent of the publishers, and the assistance of a staff of contributors distinguished for their attainments in different branches of physics and chemistry, the compilation of a new "Dictionary of Chemistry and the Allied Branches of other Sciences." This work, in five large octavo volumes, was completed in 1868; but as additions were required to keep it abreast of the continual advances of science, a supplementary volume was published in 1872, a second supplement in 1875, and a third (in two parts) in 1879 and 1881.

Mr. Watts brought out three editions of "Fownes's Manual of Chemistry," viz. the tenth, published in 1868, the eleventh in 1872, and the twelfth in 1877, and also part 1 of a thirteenth, in 1883.

He held for many years the appointments of editor of the *Journal*, and librarian, to the Chemical Society, having been appointed to the former in 1850, and to the latter in 1861. He was elected a Fellow of the Chemical Society in 1847, a Fellow of the Royal Society in 1866, and a member of the Physical Society in 1879. He was also an Honorary Member of the Pharmaceutical Society, and a Life Governor of University College.

He was engaged at the time of his death in writing a new and abridged edition of the "Dictionary of Chemistry"; he was also editing, in conjunction with Mr. C. E. Groves, a re-issue of "Knapp's Technology," and the thirteenth edition of "Fownes's Manual of Chemistry," of which the second volume is left in manuscript.

GEOLOGY AT THE BRITISH ASSOCIATION

THE arrangements for the Geological Section of the British Association are now well advanced, and some idea may be formed of the amount of work likely to be done. Several meetings of the Organising Committee have been held in London, at some of which Principal Dawson has been present. From the list of members of the Association to whom vouchers for the meeting have been issued we learn that English geology will be represented at Montreal by six professors—those of Edinburgh; Trinity College, Dublin; University College, London; Victoria University, Manchester; and University College, Nottingham; and by Prof. T. R. Jones. The Geological Society sends sixty of its Fellows, including the President, Secretary, and six other Members of Council. Many of the leading geologists of Canada also are Fellows of that Society. The Geological Survey sends six of its members, and six or more who have at one time been on the staff.

The President of the Section is Mr. W. T. Blanford, Secretary of the Geological Society, who will afterwards represent that Society at the Philadelphia meeting of the American Association; the Vice-Presidents are Prof. T.

R. Jones and Mr. A. R. Selwyn; the Secretaries are Dr. G. M. Dawson, Messrs. F. Adams, W. Topley (Recorder), and W. Whitaker.

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 Archæan rocks will receive much attention. Amongst the papers sent or promised are the following:—Prof. Bonney, on the Lithological Characters of the Archæan 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 Palæozoic Geology and Palæontology generally the following are expected:—L. W. Baily, 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; Mr. 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 Palæozoic Floras of North America and Europe, whilst Mr. J. S. Gardner will deal with the same subject as regards the Cretaceous-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 Palæozoic rocks of Canada, the Drift Deposits are of great interest. The following papers bear on this subject:—Mr. A. R. Selwyn, on a Theory of Ice Action in the Formation of Lake Basins and in the Distribution of Boulders 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:—Prof. Hull, 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 Mr. 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.

Other papers will be sent by American and Canadian geologists, particulars of which have not yet been received. Prof. James D. Dana and Dr. James Hall, if not present in person, will probably send one or more communications.

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 Phyllopora of the Palæozoic Rocks; C. E. De Rance, Underground Waters; J. W. Davis, Raygill Fissure, Yorkshire; C. E. De Rance and W. Topley, Erosion of Sea-Coasts 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 Geo-

logical Surveys; and Progress of the International Geological Map of Europe.

With several sections of the Association the work is mainly confined to the meeting room. Geologists are more fortunate, their most pleasant memories of these meetings are with the hills, rocks, and streams of the district. At and near Montreal there is much to be seen. Mount Royal rises steeply behind the city, a mass of eruptive rock intruded through the Silurian beds. From the summit a grand view is obtained over the Laurentian Mountain on the north, and over the hills and rolling plains of Silurian rocks on the south and east. From amongst these latter rise the more sharply defined trap hills of Montarville, Belloil, and Rougemont. The excursions are of especial geological interest. Niagara is only a short run of 300 miles away; the Rocky Mountains will be reached by a special train over the Canadian and Pacific Railway.

The Local Committee at Montreal is preparing a guide-book to the city and neighbourhood, which will contain a geological map. A general Geological Guide to the Dominion will be prepared by the Geological Survey of Canada.

PRIMARY EDUCATION AT THE HEALTH EXHIBITION

THE recent opening of the City and Guilds of London Institute by the Prince of Wales, and the simultaneous issue of a special catalogue of the educational exhibits at the Health Exhibition, which are for the most part housed in that Institute, has been the means of drawing much public attention to this most interesting and valuable collection, and renders some account of it opportune. It is probably not too much to say that no such elaborate and extensive collection of educational appliances, methods, and results, has ever been brought together before, notwithstanding the fact that, the primary object of the whole Exhibition being to elucidate the conditions of health, it was considered expedient to attach to the principal display mainly such objects and appliances as had a special relation to healthful school life. This limitation, however, has been interpreted somewhat liberally, and the result is a collection in which can be studied and compared the educational systems in primary, general, and technical education as practised in the British Islands, France, and Belgium, and to a less extent in Germany, Sweden, Switzerland, the United States, and Canada. It is earnestly to be hoped that such an opportunity for comparing their own systems, practice, and results with those of others, whether English or foreign, will not be allowed to pass by our schoolmasters and schoolmistresses, as well as by members of School Boards, and indeed by all interested in this vast subject. We hear with pleasure that it is intended to organise visits there by parties of London masters and mistresses, and we hope that arrangements will be made enabling provincial educationalists to avail themselves of the advantages offered by this temporary display at South Kensington, which will not be prolonged beyond the middle of October.

Two foreign Governments, those of France and Belgium, have organised elaborate collective exhibitions, showing the methods and results both of primary and secondary education in those countries, and the catalogue of the French exhibit is prefaced by ten closely printed pages containing an admirable summary of the present position of education in France, which has of late made most rapid advances. The money which neither the Liberals of the Restoration, nor those of the Monarchy of July, nor the *Corps Législatif* of the Second Empire, had been able or willing to find for popular education, the Parliament of the Third Republic, definitely consolidated in 1877, has not feared to demand of the State, notwithstanding the pressure of taxes resulting from the foreign