

tory, is fulfilling a useful function in formulating the programmes of work for the various instruments. During the year, the 6-inch and 9-inch transit circles were thoroughly examined for their fitness for fundamental work, and various adjustments and modifications were made. The latitude-variation observations made with the prime vertical instrument were compared with those made with zenith telescopes at Philadelphia, Cincinnati, and Gaithersburg, and were found to give different values. The cause of this difference between the values given by the two forms of instrument was carefully looked for in the prime-vertical observations, but could not be found. Prof. Skinner was engaged until the end of the year in preparing material for the discussion of the proper motions of the 8824 stars observed by him, and published in the A.G. Zone Catalogue  $-13^{\circ} 50'$  to  $-18^{\circ} 10'$ , but the work cannot be carried further until the cataloguing of the Washington zone observations, 1846-52, is completed.

MEASURES OF DOUBLE STARS.—Prof. Burnham continues his record of double-star measures in Nos. 4426-7 of the *Astronomische Nachrichten*, where a large number of measures, made with the 40-inch telescope during 1909, are given. Particular attention was paid to doubles generally neglected or little known, also to measurements for the better determination of the proper motions of faint stars and of doubles where the motions are small or uncertain.

#### THE BRITISH MEDICAL ASSOCIATION IN LONDON.

THE seventy-eighth annual meeting of the British Medical Association was held in London, for the first time since 1895, on July 26-30, in the buildings of the University of London. There was a very large attendance, which included a number of foreign guests and over-sea delegates and members. The Earl of Crewe and the Right Hon. Walter Long, M.P., were elected honorary members. Reference was made to Mr. Long's work, which resulted in the abolition of hydrophobia from these islands. Mr. Henry T. Butlin, the famous surgeon, was elected president. At the commencement of the proceedings he announced, amid loud cheers, that the King had signified his willingness to become patron, as his revered father was before him. The president in his address directed attention to the persevering work of the association since 1834 in placing the medical profession upon an increasingly satisfactory footing. He referred to the valuable assistance given by the association to the cause of original research. Since 1874, when scientific grants were founded, large sums have been awarded every year for research work. In 1884 two research scholarships were founded to enable men to devote their whole time to particular researches. Mr. Butlin pointed out that it was desirable to encourage research even though there were no prospect of immediate benefit from the particular line of research taken up, and he instanced cases in which an apparently unproductive investigation had led to results of vast practical importance.

At the present time the association consists of twenty-two thousand members in seventy branches. The business of the recent meeting took place in twenty-one sections dealing with particular branches of medical science, and in each section the line of inquiry which is receiving particular attention at the present time was given full discussion, foreign investigators taking a prominent part in the discussions in many of the sections. In the section of radiology and medical electricity, Sir J. J. Thomson, F.R.S., gave an address in which he pointed out that the softer rays given out from an X-ray tube were inevitably absorbed by the glass wall of the tube, and were therefore not available for application in medical treatment. He then directed attention to the researches of Prof. Barkla, of King's College, who found that substances such as metals when exposed to Röntgen radiation emitted secondary rays, the penetrating power of which was specific for the particular metal, and was independent of the penetrating power of the rays which impinged upon it. The rule was a simple one, for the hardness of the ray given out increases as the atomic weight of the metal. The only

necessary condition is that the rays emitted from the X-ray tube must be harder than the specific radiation of the substance. Only substances the atomic weight of which is greater than that of calcium are found to give out these secondary rays. We have thus the power of using rays of uniform penetration for medical treatment. Thus if silver be used, the secondary rays which it gives off are about equal in penetrating power to the  $\beta$  radiation of radium. With iron the radiation is considerably less penetrating, while with tin it is more penetrating; with iodine, extremely penetrating radiation is given off. A large number of other papers were read bearing on Röntgen-ray diagnosis and treatment, and the great advance that has been made in Röntgen-ray diagnosis came prominently to the fore. Thus the papers of Dr. H. Orton and Dr. A. C. Jordan on phthisis showed this method to be a most valuable and trustworthy means of detecting phthisis in its early stages, and of determining the extent and position of the lung trouble. In the section of medicine, Dr. A. C. Jordan also read a paper on the Röntgen-ray appearances of thoracic aneurysm, and the lantern-slides with which it was illustrated showed very clearly the condition of the heart and great arteries in this disease. In many other sections the value of Röntgen-ray diagnosis was also evident. Thus the first session of the surgery section was devoted to a discussion of the operative treatment of simple fractures, in which Mr. Arbuthnot Lane described his method of uniting the severed fragments by means of metallic plates and screws, and in his paper, and all those that followed it, the conclusions were founded, to a very great extent, upon the Röntgen-ray appearances of the fractured part.

The discussion on chronic constipation turned very largely on the Röntgen-ray examination of the large bowel after the patient had taken a meal containing an insoluble salt of bismuth. This discussion was opened by Dr. J. F. Goodhart, who pointed out that constipation in old persons was frequently due to failure of voluntary effort. He said he held a brief for the importance and utility of the large bowel in opposition to those who, following the teaching of Metchnikoff, have come to regard the large bowel as a mere place of storage for the waste material of the food, in which poisons were generated which were very apt to be injurious. The large bowel, he stated, is meant to be full, not empty. Mr. Arbuthnot Lane said that in certain cases poisons were actually generated in the large bowel to such an extent that the patient's life was intolerable. In such cases he had removed a part or the whole of the large bowel with great benefit to his patient.

Drs. Dominici and Wickham came from Paris to discuss the subject of radium treatment. They made it clear that cancer in accessible regions can be greatly reduced in size by radium treatment, and can in certain cases be actually cured. In the case of large, deeply seated growths, a cure is not to be expected, although great diminution in size may be effected and much relief afforded. Various special forms of apparatus have been devised for applying radium to internal growths such as those of the throat, œsophagus, and stomach. Early detection of the cancer and early application of radium are the most important points.

In pathology and bacteriology, a number of important papers were read by those most fitted for the task. Thus Colonel Sir David Bruce, C.B., F.R.S., discussed human trypanosomiasis, while the paper of Prof. Wassermann, of Berlin, opened a discussion on the complement-deviation method in diagnosis—the method which he introduced for the diagnosis of syphilis, and which is now used for this purpose throughout the world. Its application to certain other diseases is now being worked out, so that it is one of the most important matters before the pathologists at the present day. A discussion on the lactic acid organisms took place, at which Prof. Hewlett was among those who took part. There was a most important discussion on the effect of digitalis on the human heart, opened by Prof. Wenckebach, of Gröningen. He was followed by Dr. James Mackenzie, Sir Lauder Brunton, and others.

The subject of dental decay was given very full discussion. It is now taught that both doctors and patients should regard decay of the teeth as a serious danger-signal, and the wholesale decay in young people and in many families so prevalent at the present time requires

urgent attention. Foods that are too soft or too finely prepared are frequently causes of dental decay, and many serious illnesses, as well as cases of chronic debility, are due to poisons absorbed from the roots of decayed teeth.

The sour-milk cure, which is now in great vogue, was fully discussed from all points of view, and its benefit in suitable cases was placed beyond doubt. More practical evidence is needed, however, and the discussion will have done much to point out the directions in which this evidence should be sought.

An address on surgery was delivered by Prof. Gilbert Barling, in which he discussed the treatment of cancer. He referred in terms of praise to the work of the Imperial Cancer Research. There was evidence that the tissues resisted the inroad of cancerous growths, though little was as yet known of the nature of the resistance. We had not yet discovered the factors which heighten or lower this power of resistance. In considering the means available for the cure or relief of malignant growths, he discussed the application of X-ray and radium treatment. His conclusions were, on the whole, in agreement with those of Drs. Dominici and Wickham. He emphasised the fact that a genuine cure is not to be expected from these agents in cases of advanced cancer, and he further emphasised the great importance of early detection. Only one real opportunity for cure existed, and this was at the first operation, which should be undertaken at the earliest possible stage of the disease, and advantage of this opportunity should be pressed to its fullest extent.

Dr. J. Mitchell Bruce, in his address in medicine, gave a brief record of the most important additions to medical knowledge during the period since the association last met in London.

First came the discovery of the spirochæte of syphilis; of the part played by the mosquito in malaria and in yellow fever, and by the goat in the diffusion of Malta fever; of the connection of a trypanosome with sleeping sickness; of the Leishman-Donovan body with kala-azar; and of the *Diplococcus intracellularis meningitidis* with cerebro-spinal fever. The existence of typhoid carriers had been fully demonstrated, as well as the dangers of other typhoid products than the stools. The effects of oral sepsis had been worked out, and proved to be so widespread, so multiple, and frequently so grave, as to make us ashamed of our previous blindness to a common source of blood infection staring us in the face all those years. Auto-intoxication proper had attracted professional—and only too much public—attention, and led to the introduction of a great variety of dietetic and medicinal "cures." Of improved methods of observation and diagnosis, blood examination deserved first mention; and special interest and importance attached to the Widal reaction in typhoid and to the Wassermann reaction in syphilis. Radioscopy, which was coming into clinical use in 1895, had been greatly improved and extended, more particularly in its applications to the investigation of gastric and intestinal disorders and diseases; and the orthodiagraph must be mentioned in this connection. A great impetus had been given to the study of cardiac irregularity, and the sphygmomanometer was now generally employed. A real advance had been made in the introduction of lumbar puncture as a means of diagnosis in cerebro-spinal diseases.

"During these fifteen years several new methods of treatment of the first rank have been either introduced or perfected. Chief of all comes serum-therapy and vaccine-therapy. Of great importance is the employment of spinal analgesia as a substitute for general anæsthesia, the dangers of which have been closely investigated in relation to the status lymphaticus, as well as to post-anæsthetic acid intoxication. Other powerful means of treatment have been discovered in radium, in the Röntgen rays, and in the Finsen light."

A very complete medical museum formed an important part of the meeting. It included a very valuable series of microscopical preparations showing the blood parasites of malaria, sleeping sickness, and other tropical diseases. The Imperial Cancer Research showed a beautiful collection of specimens, lantern-slides, and diagrams giving a very good idea of the valuable methodical work which is being carried out by this institution under the directorship of Dr. E. F. Bashford. In the museum, the value of

Röntgen-ray diagnosis was again to the fore, for many of the sections showed negatives, prints, lantern-slides, or diagrams to illustrate the Röntgen-ray appearances in various diseases. There was also a large exhibition in which numerous firms of publishers, instrument makers, chemists and druggists, and manufacturers of special foods and dietetic preparations showed their most recent work. In the electrical apparatus section, the great power of the modern generating apparatus was very obvious, each firm being able to show apparatus capable of giving so powerful a spark that a Röntgen-ray photograph could be taken by a single flash. Different contrivances were shown to accomplish this, including various forms of mercury jet interrupter, of electrolytic interrupter, and the well-known Snook apparatus, in which an alternating current is generated and transformed by means of a step-up transformer placed in a bath of oil, the secondary current being rendered unidirectional by a simple contrivance. A new apparatus was shown by Messrs. Schall for raising the internal temperature of the body by employing the thermal effect from a high-frequency apparatus. In a spark-gap where the electrodes are separated only by the thickness of a sheet of paper, undamped oscillations are generated at the rate of more than a million a second. Similar oscillations are used in wireless telegraphy for the production of continuous oscillations. The voltage of this new type of generator is less than 3000, but currents of 500 to 3000 milliamperes are used, and the patient feels nothing except the rise of temperature. The method is said to be useful in chronic cases of rheumatic and gouty origin.

The social functions included a reception by the Corporation of the City of London at the Guildhall, a garden-party at Ranelagh, receptions at the Natural History Museum and at a large number of hospitals. Special services were held in Westminster Abbey and Westminster Cathedral.

There was a large and distinguished assemblage for the annual dinner, at which Dr. Butlin presided. The Earl of Aberdeen, Lord-Lieutenant of Ireland, emphasised the good work of the British Medical Association, and expressed his opinion that those responsible for measures of social and hygienic reform should come to the association for direction as to the best means by which such reform can be carried out. As an example of a much needed reform, he dwelt on the unnecessary and noxious fumes from motor-cars. In referring to the valuable scientific papers delivered at the various sectional meetings, he selected for special note the paper by Sir J. J. Thomson, the eminent Cambridge physicist, in which he pointed out that certain substances could be made to give out a radiation which had much the same physical properties as some of the radiation given out by radium, and suggested that these radiations might be found to have the same effect upon the tissues as those at present obtained by the application of radium.

The Bishop of Kensington, speaking at a breakfast given by the National Temperance League, said that temperance owed no small debt to the British Medical Association for the new light it was constantly throwing on scientific investigation. It was to the professional men rather than the politicians that we must look for the solutions of the social problems of the day, foremost among which was that of temperance.

Thus medical progress was discussed in all its aspects at this—the greatest annual meeting by far ever held by the British Medical Association—and the discussions added new vigour to the work of observation and investigation.

#### THE INSTITUTION OF MECHANICAL ENGINEERS.

THE summer meeting of the Institution of Mechanical Engineers took the form of a joint meeting with the American Society of Mechanical Engineers. More than one hundred and fifty members of the latter society took part in the meeting, which opened in Birmingham on Tuesday, July 26. The reading and discussion of papers occupied the mornings of Tuesday and Wednesday, and on Thursday the party proceeded to London, where a *conversazione* was held at the Institution House in Westminster. On Friday morning further papers were read and discussed in the lecture hall of the Institution of Civil Engineers, kindly lent for the occasion. The institution dinner took place