

latter limiting form, and not the former, which is the graph of the sum of the Fourier's series.

The matter here discussed is perhaps that referred to by Prof. Michelson in NATURE of October 6, but I did not understand his letter so. In regard to his present communication, I agree with him if he means that it is just as necessary, in tracing the part of the curve C_n near the vertical part of the broken line, to take a particular value of n , as it is to keep x within a narrow range of values corresponding to n . But this admission is not equivalent to admitting that an infinite series may be summed by stopping at any particular term. Rather it confirms the conclusion, explained above, that the graph of the sum of the infinite series contains no vertical line.

December 22.

A. E. H. LOVE.

The Schmidt-Dickert Relief Model of the Moon.

THE present location of the Schmidt-Dickert relief model of the moon is probably not generally known in Europe. Webb's "Celestial Objects for Common Telescopes" (edition of 1896) states that the model is in Bonn, and this impression probably generally prevails. As a matter of fact the model has been for about twenty years in America. It has been on exhibition only at rare intervals during the time, however, and hence has been lost sight of. By a disposition recently made of it, it has fortunately become available to students of science and the public generally. Through the generosity of Mr. Lewis Reese, of Chicago, it has been presented to the Field Columbian Museum, and is now installed in this institution.

The model is in the form of a hemisphere about nineteen feet in diameter, and upon its surface are shown, in proportional relief, over 20,000 distinct localities. In his original description, Dr. Schmidt, the eminent selenographer, states that the details were based on the chart of Beer and Madler, but many features were added from his own observations. He also states that he carefully guided and watched over the work of construction, and with his own hand tested its correctness in all essential particulars. These statements give sufficient assurance of the accuracy of the model, and the confidence with which it may be studied. It is probably the best substitute extant for a trip to the moon.

OLIVER C. FARRINGTON.

Field Columbian Museum, Chicago, December 12.

Maxwell's Logic.

IN a paper on the experimental verification of Ohm's law (Brit. Assoc. Report, 1876), Maxwell makes the following statement.

"Assume that the resistance of a given conductor, at a given temperature, is a function of the strength of the current. Since the resistance of a conductor is the same for the same current, in whichever direction the current flows, the expression for the resistance can contain only even powers of the current."

It seems to me that such an argument is not applicable to a case of this kind.

Consider, for example, the flow of a liquid along a capillary tube. We might define the resistance of any portion A B of such a tube to be the ratio of the difference of pressure between A and B to the quantity of liquid flowing across any section in unit time.

Now would it not be equally legitimate to apply the above reasoning to this case, and prove that the resistance of a capillary tube could not vary as the first power of the velocity? Although of course, there may be no physical analogy between flow of liquid and electric current. Again, imagine a uniform wire A B along which a current of electricity is flowing, the ends A and B dipping into mercury cups (say). Now, instead of reversing the direction of the current, let the wire be turned end for end. Surely there is no difference between this and the previous case, and yet the current in the wire is reversed.

JOHN LISTER.

Royal College of Science, London, South Kensington,
S.W., December 12.

LORD IVEAGH'S GIFT.

THE announcement, made in the daily papers last week, of Lord Iveagh's intention to devote the princely sum of 250,000*l.* to the endowment and promotion of bacteriological research in England, has arrested the attention of the country and of every class

of the community. The humane and enlightened sentiments that have actuated Lord Iveagh, and the liberal manner in which these have been given effect, constitute a unique claim to the gratitude and appreciation of his fellow countrymen.

The distinction of such gifts had hitherto remained, and appeared likely to remain, the prerogative of America and American millionaires. The open-handed liberality of Rockefeller, Armour and many others has enabled the United States to provide endowment for research and to equip laboratories on a scale of completeness unattempted in the mother country, whilst on the continent the scientific worker has long found encouragement and support in State-aided institutions. The result has been that in bacteriological as well as other branches of inquiry England has lagged behind.

Lord Iveagh's decision to devote the proposed endowment to an Institute that had been endeavouring with inadequate means to carry out the work which he sympathises, has met with widespread approval. It is now seven years since the British Institute of Preventive Medicine was founded with the view of establishing in England a national home for bacteriological work and inquiry. The scheme received its inception at a meeting held at the Mansion House, and from the first obtained the sympathy and support of eminent men of science and members of the medical profession. A fund was raised at the same time to provide poor patients with the means of proceeding to Paris to undergo the Pasteur treatment for rabies. This fund is still administered by the Institute, and no year has passed without several claims being made for its help.

The new Institute was duly incorporated under the Companies Act, and a Council was appointed to further its objects—first amongst these being investigations in connection with the prevention and treatment of infectious diseases. The Council elected represented all branches of scientific work likely to be benefited by bacteriological investigation, and the work of the Institute was thus at the outset wisely placed on the broadest possible basis.

The services of Lord Lister, as Chairman of Council, and of Sir Henry E. Roscoe, as Hon. Treasurer, have been of inestimable value to the fortunes of the Institute. The liberality of the Grocers' Company and of private individuals, along with a handsome donation from the Trustees of the late Mr. Berridge, enabled the Council to take steps to acquire a building site. A favourable site was acquired on easy terms at Chelsea, through the liberality of the Duke of Westminster, and building operations were commenced. The amalgamation of the College of State Medicine with the Institute was effected at the same time, and in this way temporary premises were acquired at Great Russell Street for the initiation of work. The Institute occupied these premises during four years, and the various departments to be established at Chelsea were successfully organised through the efforts of a small but zealous staff. The discovery by Behring of the antidiphtheria serum, and its beneficial use abroad, led the Institute to undertake its preparation for the first time in this country. A farm was rented at Sudbury, near Harrow, and provided with laboratory and stabling accommodation, and the preparation of the serum commenced. A public appeal was made for funds, and a sum of money, sufficient to pay the initial expenses of the new departure, was raised. The work of the antitoxin department of the Institute has since then greatly expanded—the antistreptococcus and antitetanus serum being now prepared, as well as the diphtheria serum, and placed at the disposal of medical men. The Institute also undertook the preparation of tuberculin and mallein for diagnostic purposes.

The work undertaken in the antitoxin and other departments proved a serious drain on the resources of the

Institute, and the Council, after careful consideration of the financial position, most reluctantly decided to abandon completion of the original plan of the Institute, and to leave it an unfinished building. The plans were accordingly modified by the architect, and a portion of the building was proceeded with and completed last year. The Institute took possession of the new building in May of this year, when the fittings of the main laboratories were completed. The fittings of the building, as it at present stands, are now all but completed. A most promising start has been made, and the facilities for investigation and instruction are being widely taken advantage of.

The Jenner Memorial Committee decided last autumn to transfer any funds it might receive to the Institute. The Council, in view of this, decided to alter the title to the Jenner Institute, and in this way to commemorate permanently the memory of Jenner and his work. The necessary legal formalities were completed on the 6th inst., and the Institute from that date continued its work as the Jenner Institute of Preventive Medicine.

Lord Iveagh was a generous contributor to the Jenner Fund. At the same time, the financial outlook was by no means rosy—working expenses had greatly increased at Chelsea; the salaries of the staff were insufficient, and subscriptions were coming in slowly. These facts were causing serious anxiety to those responsible for the management of the Institute. On December 20, Lord Lister was able to communicate to the Council of the Institute Lord Iveagh's munificent offer, along with the conditions attached to it. The public announcement of this noble gift and its cordial acceptance was made by Lord Lister and Sir Henry Roscoe in a letter to the press on the 23rd inst. The letter states that the bequest is given on the condition that in future the control and management of the affairs of the Institute be placed in the hands of a new Board of seven Trustees, three of the seven to be chosen by the Council of the Institute, three by the donor, and one by the Council of the Royal Society.

It is further proposed that the building of the Institute at Chelsea be enlarged, and the original scheme of the same completed; that the sadly inadequate salaries of the director and other members of the staff be increased, and that valuable scholarships and studentships in connection with the Institute be established. There are, of course, many details to be arranged and settled; but it will be seen that the scheme is far-reaching, comprehensive and carefully thought out, whilst the conditions attached are by no means onerous.

The rare modesty of the donor will not, we feel sure, prevent the realisation of the general wish that his name be gratefully and permanently associated with the beneficent work he is about to inaugurate.

Amongst the first results will be, as desired by Lord Iveagh, the completion of the Chelsea building; and the foundations being already laid, this can be proceeded with without delay. The provision to be made for an adequate emolument to the members of the staff, along with the establishment of scholarships and studentships, will furnish an incentive and encouragement hitherto lacking to workers in this field. Many promising researches have of necessity been postponed at the Institute, through the difficulty in finding sufficient assistance to carry them out. Large questions can now be attacked, and the time ungrudgingly given to their elucidation by properly trained experts. A small stream of research work has issued from the Institute; this will be widened and deepened. The students, who have come from all parts of the country and the empire for instruction in bacteriology and preventive medicine, will increase in numbers with the unique facilities that will be placed at their disposal.

The establishment of a British and Imperial Institute

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of Bacteriology is now within a measurable distance of realisation. The present building at Chelsea contains, amongst its main features, the following departments:—

- (1) The bacteriological laboratories, devoted to bacteriological investigation and instruction in connection with medicine, public health, and the pathology of disease.
- (2) The chemical and water laboratories, dealing mainly with water, soil, air, and food, in their hygienic aspects.
- (3) The Hansen laboratory, dealing with the practical applications of bacteriology to agriculture, brewing, dairy and other industries.
- (4) Research rooms for advanced workers, and museum and lecture theatre.
- (5) The requisite facilities for experimental work and investigation in connection with the causation and prevention of disease.

This work will now be placed on a sure and permanent basis, and the Institute will be brought fully abreast with the best foreign laboratories devoted to bacteriology. Through Lord Iveagh's munificence, the objects for which the Institute was established can now be developed on a scale commensurate with their importance.

ALLAN MACFADYEN.

GEORGE JAMES ALLMAN.

IN George James Allman, who died at his residence, Ardmore, Parkstone, Dorset, on Thursday, November 24, at the advanced age of eighty-six, zoological science has lost a zealous and most accomplished worker, the world a great man. He was born at Cork in 1812, being the eldest son of Mr. James Allman, of Bandon, in that county, and was educated at the Belfast Academical Institution, originally for the Bar. As with so many others born to science, he early drifted into paths most congenial to his nature, and accordingly graduated in Arts and Medicine in the University of Dublin. He became a member of the Royal College of Surgeons, Ireland, in 1842, and a Fellow in 1844, and took his M.D. (University, Dublin) and (University, Oxford) in 1847. He from early days displayed a passionate devotion to the study of organic nature, and so highly was he esteemed that during the year of his graduation he was appointed Regius Professor of Botany in the Dublin University. Here the late Professor of Geology, Beete-Jukes, was one of his most intimate friends. Thus embarked on a career of scientific work and investigation, Allman gave up all thought of the medical profession, and ten years later resigned the Dublin chair for that of Regius Professor of Natural History in the University of Edinburgh, with which was incorporated the Keepership of the Natural History Museum, and these combined offices he held until 1870, when he retired into private life. In Edinburgh he was no less a favourite than in Dublin; and his lifelong friendship with the late Lord Playfair, Lord Shand, and many of his most brilliant contemporaries began in that good old town, where he built himself the house in Manor Place, where his clever and charming wife made so happy a home for himself and his friends. During his period of activity in the two great capitals named, Allman laboured with untiring zeal, ever intent on the progress of science and the best interests of those who came under his charge. On his retirement, first to London and afterwards to Parkstone (Dorset), his energy never flagged, the most conspicuous change in his actions being the substitution of the personal care of a small but very picturesque estate of five or six acres at Parkstone, having great possibilities for a naturalist and lover of outdoor life, for the more fatiguing duties of the reception- and drawing-room, encumbent upon him in his professorial capacity. Not that Allman despised the latter, for, on the contrary, while in Edinburgh especially, his drawing-room was the rendezvous of the cultured, drawn together by