Fourier’s Series.

I should like to correct a careless error which I made [Nature, December 29, 1898] in describing the limiting form of the family of curves represented by the equation

\[ y = 2 \sin x - \frac{1}{2} \sin 2x \ldots \pm \frac{1}{n} \sin nx \ldots \]  

(1)

as a zigzag line consisting of alternate inclined and vertical portions. The inclined portions were correctly given, but the vertical portions are bisected instead of being cut off beyond the points where they meet the inclined portions, their total lengths being expressed by four times the definite integral

\[ \int_{0}^{\pi} \sin n\theta \, d\theta. \]

If we call this combination of inclined and vertical lines C\textsubscript{i} and the graph of equation (1) C\textsubscript{0}, and if any finite distance d be specified, and we take for n any number greater than 100d\textsuperscript{2}, the distance of every point in C\textsubscript{i} from C\textsubscript{0} is less than d, and the distance of every point in C\textsubscript{i} from C\textsubscript{0} is also less than d. We may therefore call C the limit (or limiting form) of the sequence of curves of which C\textsubscript{i} is the general designation.

But this limiting form of the graphs of the functions expressed by the sum (1) is different from the graph of the function expressed by the limit of that sum. In the latter the vertical portions are wanting, except their middle points.

I think this distinction important; for (with exception of what relates to my unfortunate blunder described above), whatever difference of opinion has been expressed on this subject here, for the most part, to the fact that some writers have had in mind the limit of the graphs, and others the graph of the limit of the sum. A misunderstanding on this point is a natural consequence of the usage which I have to omit the word “limit” in certain connections, as when we speak of the sum of an infinite series. In terms thus abbreviated, either of the things which I have sought to distinguish may be called the graph of the sum of the infinite series.

J. Willard Gibbs.

New Haven, April 12.

Tasmanian Firesticks.

While preparing for a second edition of the “Aborigines of Tasmania,” I received from Mr. Jas. Backhouse Walker, of Hobart, two separate accounts of fire-making by the aborigines, which differ materially from those already known. The accounts comply with the descriptions of Dr. Rayner and Mr. Myer. We describe fire as being obtained by means of the stick and groove process. Mr. Rayner’s account runs thus: “A piece of flat wood was obtained, and a groove was made the full length in the centre. Another piece of kindling about a foot in length, with a point like a blunt chisel, was worked with nearly lightning rapidity up and down the groove till it caught in a flame. As soon as the stick caught in a blaze, a piece of burnt fungus, or fungus, as it is generally termed, was applied, which would keep alight. I cannot say what kind of wood it was. My father has seen them light it. The piece with the groove, he said, was hard, the other soft. The blacks in Australia get fire by the same method, I have seen that done. I think it almost impossible for a white man to do it, for I have seen it tried, and always proved a failure.” Cotton’s account agrees in the main with Rayner’s. We are thus in possession of accounts of three distinct methods of fire production, viz.: (1) flint and