In selecting a subject for to-day's address I have had the difficult task of interesting two distinct classes of men, the astronomer and the mathematician. I have therefore chosen a topic which, I trust, will appeal to both—trigonometric series. Though I propose to treat it only in its mathematical aspects, I shall try to do so in a broad way, tracing its general influence upon the trend of mathematical thought.

As you know, the theory of the infinite trigonometric series,

\[
 f(x) = \frac{1}{2} a_0 + (a_1 \cos x + b_1 \sin x) + (a_2 \cos 2x + b_2 \sin 2x) + \ldots
\]

is different ab initio from that of the power series,

\[
 P(x) = a_0 + a_1(x - a) + a_2(x - a)^2 + \ldots
\]

For the latter the fundamental element is \(x^n\), of which the graph is, for positive \(x\), a monotone increasing function, wholly regular, without peculiarities of any sort. It is therefore in no way surprising that the power series obtained by combining terms of form \(c_n x^n\) define the most civilized members of mathematical society—the so-called analytic functions—which are most orderly in their behavior, being continuous throughout their "domains," possessing derivatives of all orders and a Taylor's series at every point; and so forth. On the other hand, the graph of \(\sin nx\) or \(\cos nx\) is a wave curve with crests and troughs, whose number in any \(x\) interval increases indefi-
Editor's Summary

This copy is for your personal, non-commercial use only.

Article Tools
Visit the online version of this article to access the personalization and article tools:
http://science.sciencemag.org/content/39/995.citation

Permissions
Obtain information about reproducing this article:
http://www.sciencemag.org/about/permissions.dtl