

appears a note concerning an important misprint in Dini's discussion of Fourier's series, referring also to a letter from Dini. Earlier in the text Dini was mentioned as the only one among several writers who had given a rigorous proof of the correctness of the expansion of  $f(x)$  in a series of terms each involving a Bessel function. This expansion caused Todhunter to state that many German writers credit Fourier with its authorship, though in fact he did not give it; and into this category it may be inferred that Nielsen has fallen.

Last of all comes a most important part of the book, a very complete bibliography, giving references to both theoretical and applied work in cylindrical harmonics. In addition, at the bottom of many pages are references to the original sources of nearly all formulas, in many cases proved by methods different from those in the text. A paper by Glaisher on Riccati's equation appeared in *Philosophical Transactions* in 1881, not in 1882, while to Schläfli's credit may be added an extensive article in *Annali di Matematica*, series 2, volume 6. In 1867 Lommel mentioned nine writers, while in this list appear one hundred and fifty-five.

With all the work which Dr. Nielsen has brought within the compass of a volume of moderate size, and in which he has had so great a share, there remain unexplored fields. Apart from his frank statement that we do not know the necessary and sufficient conditions under which a function is developable in a Fourier's series, there are other topics more closely related to the text, such as the remainder terms in null developments, and the single valuedness of developments in a Schlämilch's series, also many topics not fully treated in the present work.

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*Space and Geometry in the Light of Physiological, Psychological and Physical Inquiry.* By Dr. ERNST MACH. Translated from the German by THOMAS J. McCORMACK. Chicago, The Open Court Publishing Company, 1906. 148 pp.

To appreciate this work it is necessary to view it in its relation to two complementary movements in modern mathematical thought, namely, the logical movement and another that may be significantly called biological. The aim of the former has been to detect and to enumerate all definite ideas or terms that are indefinable and all definite propositions that are indemonstrable,