Hindenburg, Carl Friedrich | Encyclopedia.com

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(*b*. Dresden, Germany, 13 July 1741; *d*. Leipzig, Germany, 17 March 1808)

mathematics.

The son of a merchant, Hindenburg was privately tutored at home. He later attended the Gymnasium in Freiberg, and in 1757 he entered the University of Leipzig, where he studied medicine, philosophy, classical languages, physics, mathematics, and aesthetics. Through the assistance of C. F. Gellert, one of his tutors, Hindenburg become tutor to a young man named Schoenborn, whom he accompanied to the universities of Leipzig and Göttingen. His student's distinct interest in mathematics inspired Hindenburg to become increasingly occupied with mathematical studies, and he befriended A. G. Kaestner. In 1771 he received the M.A. at Leipzig, where he became a private lecturer and, in 1781, extraordinary professor of philosophy. In 1786 he was made professor of physics at Leipzing, a post he held until his death.

Hindenburg's first scientific publications were in philology (1763, 1769); his dissertation as professor of physics was on water pumps. His earliest mathematical investigations, in which he described a method of determining by denumerable methods the terms of arithmetic series, were published in 1776.

In 1778 Hindenburg's first publication on combinatorials appeared. Through a series of papers on this subject, as well as through his teaching, he became the founder of the "combinatorial school" in Germany. Combinatorial mathematics was not new at that time: Pascal, Leibniz, Wallis, the Bernoullis, De Moivre, and Euler, among others, had contributed to it. Hindenburg and his school attempted, through systematic development of combinatorials, to give it a key position within the various mathematical disciplines. Combinatorial considerations, especially appropriate symbols, were useful in the calculations of probabilities, in the development of series, in the inversion of series, and in the development of formulas for higher differntials.

This utility led Hindenburg and his school to entertain great expectations: they wanted combinatorial operations to have the same importance as those of arithmetic, algebra, and analayis. They developed a complicated system of symbols for fundamental combinatorial concepts, such as permutations, variations, and combinations. Various authors developed this system along different lines, but its cumbersomeness soon made it outmoded. The following "central problem" of Hindenburg might be taken as characteristic of the efforts of his school: Represent a random coefficient, b_i, explicity by means of a_i (k=0, 1,..., m) in the equation

The importance that Hindenburg attached to his investigations is shown by the title of the work that summarized his unified system: *Der polynomische Lehrsatz, das wichtigste Theorem der ganzen Analysis* (1796).

None of these great expectations has been realized, perhaps because Hindenburg and his followers were concerned more with the formal transformation of known results than with new discoveries. Thus the combinatorial school did not contribute to the development of the theory of determinants (Binet, Cauchy, Jacobi), although the latter made much use of the fundamental combinatorial concepts. The school's influence was limited to Germany, and no leading contemporary mathematician was member.

Apart from founding the combinatorial school, Hindenburg was the first in Germany to publish professional journals for mathematics and allied fields. From 1781 to 1785, with C. B. Funck and N. G. Leske, he published the *Leipziger Magazin für Naturkunde, Mathematik und Ökonomie* and, from 1786 to 1789, with Johann III Bernouli, the *LeipzigerMagazin für angewandte und reine Mathematik*. From 1795 to 1800 he edited the *Archiv der reinen und angewandten Mathematik* and the *Sammlung Kombinatorisch-analytischer Abhandlungen*.

BIBLIOGRAPHY

I. Original Works. Hindenburg's writing include *Beschreibung einer neuen Art nach einem bekannten Gesetz fortgehende Zahlen durch Abzählen oder Abmessen bequem zu finden* (Leipzig, 1776); *Infinitionomii dignitatum indeterminarum leges ac formulae* (Göttingen, 1778; enl. ed., 1779); *Methodus nova et facilis serierum infinitarum ehibendi dignitates exponentis indeterminati* (Göttingen, 1778); *Novi systematis permutationum, combinationum ac variationum primae lineae* (Leipzig, 1781); and *Der polynomische Lehrsatz, das wichtigste Theorem der ganzen Analysis* (Leipzig, 1796).

II. Secondary Literature. See M. Cantor, *Vorlesungen über Geschichte der Mathematik* IV (Leipzig, 1908); E. Netto, in *Enzyklopädie der mathematischen Wissenschaften,* I, pt. 1 (Leipzig, 1898–1904); H. Oettinger, “Über den Begriff der Kombinationslehre und die Bezeichnungen in derselben,” in (J. A. Grunert’s) *Archiv der Mathematik und Physik*, **15** (1850), 271–374; and I. C. Weingärtner, *Lehrbuch der kombinatorischen Analysis, nach der Theorie des Herrn Professor Hindenburg ausgearbeitet*, 2 vols. (Leipzig, 1800–1801), which contains a list of all the important writings of the “combinatorial school” to 1800.

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