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(*b*, Schleinz, Austria, 31 August 1880; *d*, Munich, Germany, 17 February 1964)

mathematics.

Tietze was the son of Emil Tietze, director of the Geological Institute at the University of Vienna, and of Rosa von Hauer, daughter of the geologist Franz Ritter von Hauer. He was married in 1907 to Leontine Petraschek; they had no children.

Tietze began the study of mathematics at Vienna in 1898. Following the advice of his friend Gustav Herlgotz, in 1902 he went for a year to Munich and then returned to Vienna. Gustav von Escherich was his adviser, and for the dissertation "Über Funktionalgleichungen, deren Lösunen keiner algebraischen Differentialgleichung genügen können" Tietze was awarded the Ph.D. in 1904. Through Wilhelm Wirtinger's lectures on algebraic functions and their integrals, Tietze became interested in topological problems, thereafter the focus of his most important mathematical work. In 1908 he qualified as lecturer at Vienna with the Habilitationsschrift "Über die topologischen Invarianten mehrdimensionaler Mannigfaltigkeiten", Topology— at this time still in a rudimentary stage—involved studying the properties of geometrical objects, which are invariant with respect to bijective and bicontinous mappings. Today it is one of the most important foundations of mathematics. In his *Habilitationsschrift*, Tietze made essential contributions to combinatory topology, inspired by results of Henri Poincaré. He accepted position as associate professor of mathematics at the Technical College of Brünn (today Brno) in 1910, and was promoted to full professor in 1913.

Drafted into the Austrian army during World War I, Tietze was forced to interrupt his academic activities. He returned to Brünn after the war, and in 1919 he accepted a full professorship at the University of Erlangen. While at Erlangen he wrote his three-part "Beiträge zur allgemeinen Topologie". Part I is concerned with axioms for different versions of the concept of neighborhood; today one of them bears his name. In 1925 Tietze accepted an offer from the University of Munich, where Constantin Carathéodory and Osker Perron were colleagues. Most of his some 120 publications were produced during his tenure at Munich. He retired in 1950 but continued his research until a short time before his death in 1964.

As a topologist Tietze did pioneering work. In addition to the papers previously mentioned, his first publiction, "Über das Problem der Nachbargebiete im Raum" (1905), should be noted. Whereas in the plane there are at most four domains touching one another along a line, it was already known that in three-dimensional space there exist any number of solids touching one another along a surface. Tietze showed that this can occur even in convex domains. In a further publication, "Einige Bemerkungen über das Problem des Kartenfärbens auf einseitigen Flächen", (1910), he proved that six is the minimum number of colors needed to color any map on the Möbius band or on the projective plane.

In 1914 Tietze stated the important theorem, which now bears his name, that any function bounded and continous on a closed set can be continously extended to the whole space. With his friend Leopold Vietoris, he published an article in the *Encykopädie der mathematischen Wissenschaften* ("Beziehungen zwischen den verschiedenen Zwiegen der Topologie", 1930), which discusses the relationship between combinatorial topology and set theoretic topology. This work also was crucially important in clarifying the terminology, which was not yet standardized. Tietze's other papers on topology deal with the theory of knots, Jordan curves, and continous mappings of areas, among other subjects.

In addition to topology, Tietze worked in many other fields of mathematics. In 1909 he noticed that the usual criterion for the possibility of constructing a geometrical figure with only compass and ruler as instruments is not sufficient. The arrangement of the constructed points also plays an important role that must be considered. For the theory of continued fractions Tietze developed a decisive criterion of convergence based on geometrical ideas. Further papers involved the theory of convex domains and the fundamental theorem of symmetrical functions, which he proved in a new manner, extending it to the case of an infinite number of variables. In analysis, Tietze gave a new demonstration for J. B. J. Fourier and F. F. D. Budan's rules of signs, generalizing these rules to nonrational holomorphic functions. Tietze's Über das Schicksal gemischter Populationen nach den Mendelschen Vererbungsgesetzen" (1923) treats p problem belonging to an area of what today is called biomathematics. Between 1940 and 1944 Tietze wrote a series of papers on systems of lattice points and partitions, on the distribution of prime numbers, and on questions of differential geometry.

Tietze's publications mentioned above were addressed to the specialist, but Tietze took great pains to make mathematical problems clear to the general public as well. For this purpose he wrote the two-volume *Gelöste und ungelöste mathematische Probleme aus alter und neuer Zeit* (1949; translated into English and Dutch). It shows his gift for representing even difficult mathematical questions in a very clear and impressive manner for interested people.

In 1929 Tietze was elected a member of the Bavarian Academy of Sciences, and in the years 1934 1942 and 1946–1951 he was secretary of its Mathematical-Natural Sciences Division. He also was a corresponding member of the Austrian Academy of Science (elected 1959) and received the Bavarian Verdienstorden (1959).

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