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(*b*. Chkhenisi, Russia [now Samtredia district, Georgian S.S.R.], H August 1889; *d*. Tbilisi, U.S.S.R., 2 October 1929)

mathematics.

Razmadze was a son of a railway employee, Mikhail Gavrilovich Razmadze, and of the former Nino Georgievna Nodia. In 1906 he graduated from high school in Kutaisi and in 1910 from the mathematics department of the University of Moscow, then taught mathematics in high schools for several years. In 1917 he passed the examinations for the master's degree and for a short time was a lecturer at Moscow University. At the end of 1917 Razmadze returned to Georgia and became one of the most prominent organizers of higher education and scientific research there. He was one of the founders of Tbilisi University, opened in 1918, particularly of the physics and Mathematics Faculty; and he spent the rest of his life as a professor there. Razmadze also had a major role in the elaboration of Georgian mathematical terminology and textbooks. He wrote texts in Georgian on infinitesimal calculus, on the introduction to analysis (1920), and on the theory of indefinite integrals (1922). These works were to have been parts of a complete course of analysis, which Razmadze was unable to complete.

Razmadze's investigations covered the calculus of variations. In this field he followed the classical direction of Weierstrass, and partly that of David Hilbert. In his first paper, published in 1914, he considered the problem of determining the plane curve minimizing the integral when one end point of the curve is fixed and the necessary and sufficient free; he established the necessary and sufficient conditions of the existence of a minimum. Razmadze next largely generalized the so called fundamental lemma of the calculus of variations; form Razmadze's lemma, Euler's differential equation for extremals of the integral deduced very simply and without partial integration.

Razmadze obtained his most important results when investigating discontinuous solutions. The first problems of the calculus of variations to be studied were those in which solutions are represented by smooth curves with continuously changing tangents. But there are problems which do not have such solutions and may be solved, for instance, by means of continuous curves with corners, where a slope of the tangent line has a jump. Such solutions, systematically studied by G. Erdmann and later by Caratheodory, were called discontinuous; but Razmadze designated them more properly as angular solutions. Proceeding further, Razmadze developed a comprehensive theory of the solutions represented by curves with a finite number to the International Congress of Mathematicians at Toronto in 1924, and for that paper he received the doctorate in mathematics from the Sorbonne in 1925.

BIBLIOGRAPHY

I. Original Works. Razmadze's writings include "Über Lösungen mit einem variablen Endpunkt in der Variationsrechnung," in *Mathematische Annalen*, **75** (1914), 380–401; "Deux propositions du calcul des variations," in *Bulletin de l' Universite de Tiflis*, **1** (1919–1920), 157–172; *Introduction to Analysis***84** (1922), 115–116;*Theory of Indefinite Integrals* (Tbilisi, 1922), in Georgian; "Über unstetige Lösungen," in *Bulletin de l' Universite de Tiflis***2** (1922–1923), 282–312; "Sur une condition de minimum cecessaire pour solutions anguleuses dans le calcul des variations," in *Bulletin de la Societe mathematique de France*, **51** (1923), 223–235; and "Sur les solutions discontinues dans le calcul des variations," in *Mathematische Annalen,***94** (1925), 1–52.

II. Secondary Literature. See L. P. Gokieli, "A. M. Razmadze," in *Trudy Tbilisskogo mathematicheskogo instituta,***1** (1937), 6–10, with bibliography of Razmadze's works on 10; and L. Tonelli, "Andrea Razmadze," ibid., 11–13.

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