962-P1-19   **Charles P. Funkhouser*** (`mtboy@uwyo.edu`), Mathematics Department, Box 3036 - University Station, Laramie, WY 82071. *Teaching and Learning Proof Using a "Genetic" Approach.*

This paper reports on a constructivist approach to the teaching of proof called the "genetic approach" modeled in a history of mathematics course. A developmental orientation to investigating topics and problems was fostered among 85 mathematics and mathematics education majors in the course. Students considered proofs which challenged mathematicians over the course of 2000 years–proofs which ultimately led to the Fundamental Theorem of Calculus. Examples of mathematical topics and problems, considered to be at the core of modern calculus, included problems associated with finding the relationship between figure and number ("squaring a circle" and quadrature of the parabola), rational and irrational numbers (commensurability and incommensurability of lengths), roots of polynomials (Gauss' theorem on monic polynomials), and 17th-century discoveries of the relationship of among number, geometry and functions (Fermat, Newton and Leibniz' work). Uses of technology to enhance both student understanding of mathematical concepts and to highlight the organic nature of mathematical proof also are presented. Implications for the secondary and post-secondary school mathematics curriculum and suggestions for further study are offered. (Received June 03, 2000)