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EARTH ROTATION AND RIVER EROSION

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INTRODUCTION

THE singular and romantic fact that all moving bodies on the earth are subject to a deviating or deflecting force due to the rotation of the globe is a modern discovery. The chief application of the law, that the deflection is always to the right in the northern hemisphere, regardless of the direction of movement, and to the left in the southern hemisphere, has its very important application to the atmospheric circulation.

Until the middle of the past century the winds were supposed to be lawless. (St. John, iii, 8). And it remained for a school teacher in Nashville, Tennessee, with a flair for mathematics, Mr. William Ferrel, to make the interesting and important discovery that the prevailing currents of the air are an effect of the earth rotation. His analysis of the forces and his description of the winds, published during the years 1856–1889, yet remain authoritative.

The suggestion that the right-hand deflection of moving bodies might produce excessive erosion of the right banks of rivers was made, by American geologists, in 1873 and 1877, and has been accepted without sufficient study.[1] A recent reference in SCIENCE for February 19 (Vol. 75, pp. 215–216) is the immediate occasion for this writing:

[1] (1) W. C. Kerr, "Topography as Affected by Rotation of the Earth," *Proc. Amer. Phil. Soc.*, 13: 190–192, 1873; (2) Elias Lewis, Jr., "Certain Features of the Valleys or Water Courses of Southern Long Island," *Amer. Jour. Sci.*, 13: 215–216, 1877; (3) G. K. Gilbert, "The Sufficiency of Terrestrial Rotation for the Deflection of Streams," *Amer. Jour. Sci.*, 27: 427–432, 1884; (4) M. L. Fuller, "The Geology of Long Island," *U. S. Geol. Survey, Prof. Paper* 82, 50–51, 1914; (5) Kirk Bryan and Shirley L. Mason, "Asymmetric Valleys and Climatic Boundaries," SCIENCE, 75: 215–216, 1932.