Electrostatic Forces in the Earth's Crust

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(This paper was presented under the title of "Electrical Plate Tectonics" at the Fall Meeting of the American Geophysical Union, in San Francisco, in December, 1981 [1].)

Abstract

All high temperature (red-hot) materials emit electric charges into their environment, like the cathode of an electron tube. The Earth's magma surface is considered as such a thermionic cathode. The semiconducting crust radially separates the negative charges (free electrons) from the positive ions by conducting the electrons only. The electron infusion of the crust is a volume charge, thus the continents are much more charged than the ocean floor. Like-charged bodies repel one another by Coulomb's electric force. On the unbounded but finite surface of a sphere charged bodies move into relative positions where their mutual repulsion forces cancel out. These positions are determined only by the number of bodies and their charge ratios. These positions form distinct patterns characteristic to the number of bodies. Two bodies move 180° apart, their pattern is the straight line which interconnects them. Three bodies form a triangle, four bodies form a triangular pyramid, five bodies a rectangular pyramid. Six bodies form a pentagonal pyramid. The six

continents of the Earth markedly form a pentagonal pyramid. Africa is at the apex, lines drawn from its center to the centers of the other continents are evenly spaced at 72°. The other five centers are nearly on a common plane to form the pyramid's base plane. The volume and the charge of the continents vary in time for geological reasons. "Continental drift" takes place, in very forceful millimeter steps, to keep the mutual electric forces cancelled.

Several observations indicate that the Earth's crust is electrically charged. "Soon after the first commercial telegraph came into use (1844), there appeared strange electric currents which intruded on the telegraph lines and occasionally interfered with the sending of messages. Because a single line was used which, when in operation, was connected to Earth at both ends, an additional channel was offered for the electric currents of the Earth. Close observation of the currents in lines of the British telegraph system led W.H. Barlow to conclude in 1847 that such currents came from the Earth and may be detected at any time..." [2]. During the next 100 years a great worldwide effort has been spent on investigating the origin of these currents which became known as terrestrial electricity, horizontal earth currents, telluric currents, or electrical potential gradient of the ground. However, no explanation has resulted. These currents are a permanent feature of the crust, and they show a highly regular diurnal and seasonal periodicity, but are independent of the local weather. A scientific encyclopedia clearly expresses the frustration over the lack of explanation when it describes a subset of earth-currents: "Vertical Earth currents. This term is used to denote a phenomenon observed chiefly in mountains. According to one interpretation electric currents flow in the Earth from all sides of a mountain toward the top. No plausible explanation for such a phenomenon has been proposed, and