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SUMMARY

(1) The transformation of gravitational force into an electric current is submitted as a promising approach to new practical uses for gravity. The approach is based on established knowledge of physics, together with what are believed to be logical deductions from that knowledge.

(2) The direct transformation of gravitational force into an electric current should result from proper use of a new class of solids, called "geoelectric crystals". Such crystals undergo elastic deformation which varies with the alignment of the crystal in the gravitational field, otherwise having qualities common to piezoelectric crystals, which are known to respond to pressure with the production of an electric current. One approach involves a single crystal plate which, at right angles to the gravity field, bends (or is stressed), giving small electric currents, not bending when perpendicular to the field; the other involves many plates cut with respect to the variation of deformation-susceptibility with direction in the crystal. Centrifugal acceleration is proposed for experimental verification.

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ON THE PRODUCTION OF ELECTRIC ENERGY
BY GRAVITATIONAL FORCE

GEOELECTRIC CRYSTALS

Due to its inherent elastic qualities, a solid is very slightly deformed within the field of gravity, just as is the more obvious case of less viscous substances like liquids. The elastic qualities of certain crystals differ with direction within the crystal. Hence, certain crystals should undergo a slight elastic deformation which varies according to the alignment of the crystal with respect to the gravitational field of force.

The crystals which exhibit this variable deformation are molecularly asymmetric, lacking a center of symmetry; molecularly symmetrical crystals cannot show these variations in gravity-induced deformation.

It follows, therefore, that there exists an entire class of unique solids--these may be designated as geoelectric crystals. The geoelectric crystals are analogous to and possess properties in common with piezoelectric crystals. In addition to being molecularly asymmetric, the geoelectric crystal may exhibit asymmetry in either a complex anion or cation, as this may influence the whole lattice in favor of the effect, or, involve the two groups as they affect the over-all crystal symmetry. Also, geoelectric crystals are non-conductive to electricity.

An important distinction is to be made between geoelectric and piezoelectric crystals: In the former the crystallomechanical characteristics are of very much significance. That is, the mechanical or elastic qualities, with respect to crystal axes, may decide whether an otherwise theoretically suitable crystal qualifies as geoelectric. This means that the

more elastic a crystal is or the greater the differences in susceptibility to deformation, within a given crystal, with respect to direction, other things being equal, the more efficient the crystal is in transforming the gravity-induced mechanical changes into an electric current.

ELECTRIC ENERGY PRODUCTION

Since the stresses caused by gravitational force in geoelectric crystals vary with the crystal axes and their alignment with respect to the gravity field, by properly cutting and arranging plates from geoelectric crystals, a direct transformation of gravitational force into electric current should be feasible.

Of the several experimental approaches which are evident, two simple ones may be briefly discussed. One method involves a large plate cut from a geoelectric crystal; the other method depends upon two series of many geoelectric crystal plates.

In the single-plate method, a very thin, long and narrow plate is cut from a suitable crystal. This plate is mounted so as to be supported at the ends only. Normally, such an assembly would be regarded as an unloaded beam. However, because of gravitational force and in view of the geometry, especially the thinness, of the slightly elastic geoelectric crystal plate, midway between its supports it will bend slightly, giving a very slight concave upper surface.

This bending occurs most when the plate is supported at right angles to the gravity field. When the plate is aligned perpendicularly to the gravity field, i.e., stood on end, the bending disappears. Hence, horizontally mounted, electric leads from opposite sides of the plate will supply a small electric current, just as a piezoelectric crystal does when under pressure; perpendicularly mounted, this current will decrease or cease for the foregoing reasons.

By use of many such geoelectric crystal plates, each supported at the

ends only, parallel or series circuits are employed to form a cell, depending upon whether the internal resistance of the cell is very much larger or smaller than the external resistance of the circuit. Appropriate electronic detecting and amplifying means are used to assay the gravity-induced electric current.

Instead of supporting the crystal plate at both ends, a one-end, clamp style mount may be relied upon for greater bending freedom.

The multiple two-series plate method comprises two series of many geoelectric crystal plates. All plates of one series are cut identically with respect to certain crystal axes and positioned identically with respect to the gravity field. All plates of the other series are cut identically with respect to certain other crystal axes and positioned similarly.

Taking a quartz crystal as an example (though quartz may not qualify because of crystallomechanical limitations), the plates for the two series are cut on two different angles, the x -(electric) and the y -(mechanical) axes being the frames of reference. The angles of the cuts are determined by measurement and/or calculation of the differences in elastic qualities as they vary with direction in the asymmetric crystal.

The geoelectric crystal plates are then alternately assembled into a cell; in this cell each of the plates is insulated from the other. Each member of a given series of plates is then connected with the other members; or, a series circuit can be used, again depending upon the internal resistance of the cell. The result should be a battery-like apparatus which responds to gravitational force by the production of electric energy.

EXPERIMENTAL VERIFICATION

Quite obviously, any such "geoelectric battery" must be considered only as a first step to the problem of changing gravitational energy into

some other form of usable energy. Should the approach prove successful, then developmental work will show the way to scaled-up, more practical applications. Once electric energy is obtained, heat or other forms of energy can likewise be secured.

The present approach is readily subject to experimental verification by relatively simple means. Since gravitational force and centrifugal acceleration are the same thing, it is practical to utilize the latter force for testing solids for geoelectric qualities, for appraising various crystal cuts for performance, and for investigating different geoelectric battery design and construction.

Both the single-plate and the multiple, two-series plate apparatus previously described can be placed in a centrifuge. Under centrifugal acceleration, which will greatly enhance the elastic deformation and so increase any electric current production, any direct transformation of centrifugal force, i.e., basically gravitational force, into an electric current can be detected, amplified and measured by the usual electronic means.