Condensed Outlines of
Proposed Fundamental Research

SECTION A - ANOMALOUS BEHAVIOR OF MASSIVE HIGH-K DIELECTRICS:

I - General Description.
II - Investigation of the Biefeld-Brown Effect

(a) Basic pendulum experiment

1. Effects of mass
2. Effects of K in fluid media
3. High vacuum tests
4. Mathematical relationships involved, derivation of equation

(b) Series-capacitor experiments:

1. Effects of mass
2. Effects of K in internal dielectric
3. Effects of K in external fluid dielectric
4. External electrostatic forces
5. Effects of shielding

(c) Variations of ponderomotive forces with time:

1. Studies of possible causes
2. Design of continuous recording instrument

III - Variations of K with electrostatic potential and/or gravitational potential

(a) Studies of hypothesis; mathematical relationships involved.
(b) Implications of effect of electrostatic potential and gravitational potential upon:

1. speed of light
2. rates of nuclear fission

(c) Measurement of change in potential difference in capacitors with change in electrostatic potential and/or gravitational potential

(d) Studies looking toward a possible corresponding change in (w) with electrostatic potential and/or gravitational potential

IV - Studies of massive high-K dielectrics

(a) Theory of dielectrics, sources of polarization

(b) Detailed examination of titanium oxide, barium titanate, lithium thallium tartrate - looking toward increasing values of K

(c) Measurement of ponderomotive forces developed by series capacitors containing high-K dielectrics:

1. With applied potential in steady state
2. With changing potential
3. Effects of varying rate-of-change

(d) Potential differences developed in polarized materials with change in over-all electrostatic potential

1. Effects of mass
2. Effects of K

(e) Stability of electrets:

1. Anomalous rates of voltage decay
2. Diurnal variations

V - Analysis of Electrified Disc-airfoils

(a) Theoretical considerations
(b) Thrust measurements:

1. In air at reduced pressure
2. In hard vacuum
3. In fluid dielectrics of various K
4. Effects of viscosity of fluid dielectrics

SECTION B - ELECTROGRAVITIC INDUCTIVE EFFECTS:

I - General Description

II - Investigation of the Fernando Sanford Effect

(a) Repeat experiments
(b) Series-capacitor experiments
(c) Theoretical considerations

III - Studies of Potential Variations

(a) In large insulated masses
(b) Effects of mass
(c) In capacitors
(d) Electrical potential vs. gravitational potential
(e) The mountain effect
(f) Centrifugal potential effects

IV - Studies of Voltage Gradients in Dielectric Materials

(a) Long-series capacitors
(b) Effects of mass
(c) Directional gravitational effects

V - Polar Capacitors

(a) Shift of potential of the mid-point
(b) Directional effects
(c) Effects of elevation from earth
(d) Tests below earth surface

VI - Short-period Gravity Meter

(a) Design and Construction
(b) Detection of gravitational waves

REFERENCE:

Terrestrial Electricity, Fernando Sanford, Professor Emeritus of Physics - Stanford University. Stanford University Press.

SECTION C - DETERMINATIONS OF TIDAL EFFECTS ON BROWN DIFFERENTIAL ELECTROMETER

I - General Description
II - Analysis of Zanesville and Philadelphia observations

(a) Solar component
(b) Sidereal component
(c) Lunar components, correlations with:

1. Lunar hour angle
2. Angular distance, phase
3. Distance from earth
4. Altitude of moon
5. Right ascension of moon

(d) Studies of combined effects
(e) Detailed comparison of Zanesville and Philadelphia observations
(f) Comparison with simple tidal curves:

1. Ocean tides
2. Atmospheric tides, barometric (Maris effect)

(g) Secular changes
(h) Correlation with other natural variables

III - Analysis of California observations

(a) Secular changes
(b) Solar, lunar and Sidereal components
(c) 75th meridian and 120th meridian observations
(d) Regional vs world-wide variations
(e) Local variations
(f) Correlation with other factors

IV - Analysis of Fernando Sanford Records

(a) Solar, lunar and sidereal components
(b) Comparison with Zanesville and Philadelphia records
(c) Comparison with atmospheric electric gradient and earth current records

V - Analysis of Section A electrometer observations (Current Program)

(a) Studies related to gravitational and electrical variables
(b) Secular changes
(c) Comparison with former records

VI - Analysis of Section D thermoactivity observations (Current Program)

(a) Diurnal variations
(b) Secular changes
(c) Comparison with Section V records

SECTION D - GRAVITATIONAL ISOTOPES

I - Investigation of the Charles Francis Brush Effects

(a) Impairment of gravitational acceleration:

1. In complex silicates, lavas and clays
2. In barium aluminate, barium titanate and other high-K materials

(b) Persistent generation of heat:

1. Calorimetric analysis
2. Mass effect, particle size
3. Diurnal variations

(c) Correlations between (a) and (b)

II - Studies of Gravitational Isotopes as Distinguished from Mass Isotopes

(a) Definitions
(b) Theoretical considerations
(c) Gravitational periodic table of the elements:

1. Specific gravities with positive and negative anomalies
2. The Lanthanide contraction
3. Parallels between the lanthanide and actinide series of elements

(d) Spontaneous evolution of heat:

1. Parallels between thermoactivity and radioactivity
2. Decay of thermoactivity, increase of gravitational mass, computations of half-life
3. Exponential increase in thermoactivity with total (localized) mass
4. Possibilities of "critical mass" effects

(e) Determination of origin of energy:

1. Unstable electron shells
2. Dirac "holes"
3. Possibilities of negative mass. Lofting properties
4. Effects of electric and magnetic fields
5. Effects of changes in electric and/or gravitational potential
6. Diurnal and secular variations in thermoactivity and/or weight

III - Beneficiation of Gravitational Isotopes

(a) Occurrence in nature:

1. In all elements
2. In rare-earth elements
3. In special cases

(b) Nascent gravitational isotopes:

1. Enrichment following chemical or nuclear reactions
2. Presence in reaction products of nuclear reactors
3. Breeder technique

(c) Methods of beneficiation:

1. Settling and centrifuging
2. Settling and thermal diffusion

IV - Possible Uses of Gravitational Isotopes

(a) Super-light (and super-heavy) fractions for:

1. Materials of construction (alloys)
2. Sensitive elements of navigational instruments

(b) Contra-terrene (negative gravitational mass) possibilities as (fixed lift) lofting agents:

1. Materials of construction for aircraft and spacecraft
2. Lofting "capsules"

(c) As a source of heat

1. Building materials (and the like) where slight warming effect is desired
2. Steam generation (similar to but less energetic than nuclear fuels)
3. Explosives

REFERENCES:

Brush, C.F., Physical Review, 31, p 1113(A), 32, p 633 abstract; Proc. Amer. Philosophical Soc. Vol.IX No. 2, 1921; Vol. LXVII No. 2, 1928; Vol LXVIII No. 1, 1929; Journal of Franklin Inst., Vol. 206, No. 1, 1928.

Harrington, E.A., Nat'l Bu. of Standards, Proc. Amer. Philosophical Soc., Vol. LXXII, No. 5, 1933.

GRAVITATIONAL PERIODIC TABLE OF THE ELEMENTS
Indicating parallel relationships

1 Hydrogen

GROUP I	**GROUP II**
2 Helium	10 Neon
3 Lithium	11 Sodium
4 Beryllium	12 Magnesium
5 Boron	13 Aluminum
6 Carbon	14 Silicon
7 Nitrogen	15 Phosphorus
8 Oxygen	16 Sulfur
9 Flourine	17 Chlorine

GROUP III	**GROUP IV**
18 Argon	36 Krypton
19 Potassium	37 Rubidium
20 Calcium	38 Strontium
21 Scandium	39 Yttrium
22 Titanium	40 Zirconium
23 Vanadium	41 Niobium
24 Chromium	42 Molybdenum
25 Manganese	43 Technicium
26 Iron	44 Ruthenium
27 Cobalt	45 Rodium
28 Nickel	46 Palladium
29 Copper	47 Silver
30 Zinc	48 Cadmium
31 Gallium	49 Indium
32 Germanium	50 Tin
33 Arsenic	51 Antimony
34 Selenium	52 Tellurium
35 Bromine	53 Iodine

GROUP V	GROUP VI
54 Zenon	86 Radon
55 Caesium	87 Francium
56 Barium	88 Radium
57 Lanthanum	89 Actinium
58 Cerium	90 Thorium
59 Praseodymium	91 Proactinium
60 Neodymium	92 Uranium
61 Promethium	93 Neptunium
62 Samarium	94 Plutonium
63 Europium	95 Americium
64 Gadolinium	96 Curium
65 Terbium	97 Berkelium
66 Dysprosium	98 Californium
67 Holmium	99 Einsteinium
68 Erbium	100 Fermium
69 Thulium	101
70 Ytterbium	102
71 Lutecium	103
72 Halfnium	104
73 Tantalum	105
74 Tungsten	106
75 Rhenium	107
76 Osmium	108 Newtonium
77 Iridium	109
78 Platinum	110
79 Gold	111
80 Mercury	112
81 Thallium	113
82 Lead	114
83 Bismuth	115
84 Polonium	116
85 Astatine	117