

THE MORAY ENERGY DEVICE--

ITS WORKINGS

by
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Provo, Utah

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UPDATE

Toward the first of December 1981, and again on February 4, 1982, I visited a close relative of T. E. Moray at his home in Salt Lake City, where he reported to me he had seen, both assembled and disassembled, and had played with Moray's energy devices. He said he saw the very earliest one right up to the most advanced, at least up until 1937. He strongly discounts the use of any exotic materials in the construction of Moray's devices, saying "I saw the machine, and there were only a few simple parts to it." (The machine he was referring to was probably the 1928 or 1929 version.) He said he saw the first of Moray's machines, from the one which dimly lit one 100-watt bulb to the one which only required the small discharge from an energetically rubbed electrophorus to start it, and which lit 40 bulbs or so.

Moray's relative said he told Moray the machine "would make the best burglar alarm in the world," because on an occasion when the relative came within 6 or 7 feet of it, during the time Moray left the room, it turned off, making at the same time a hard-to-describe "click." It was made of common electrical components of the time, and he said he believes the principle of operation was simple. He described the light bulbs, giving off a different, brighter hue of light than normal, a light that had a "yellowish tint" to it. When he went to touch the light bulbs, he found they were cold, but Moray cautioned him not to handle them, because one spot on each, on the side toward the top, but "off center," about the size of a dime, was hot. The relative could not explain why the machine did not turn off when Moray was close to it.

Loray's relative said the 1937 machine could be started in several ways. "By turning the dials" it would start, but the quickest way to prime the machine to "start the siphoning" was when Moray rubbed two "electrophorus discs together," generating static electricity, which when touched to the machine, caused some 48 bulbs to light up "brilliantly." "Moray," the relative explained "said there was a sea of energy around the earth," and all that was necessary was to get the machine going.

He explained he was present at the time Moray's large, 80-foot antenna poles were erected. He believes the antenna was an insulated wire about a quarter inch in diameter. He said a larger, inch-thick wire was tried, but without improvement, so it was taken down. The poles themselves posed a danger, as they were so tall, so they were taken down, too, later on. The machine, later on, would work in a room without an outside antenna.

Moray's relative referred me to yet another witness of the machine of T. H. Moray. I interviewed the man, born in 1917, who in 1929 or 1930 was in a boy scout troop of which Moray was the scoutmaster. The 6 to 10 scouts thought Moray was "a great guy." The eyewitness I interviewed was, in addition to being a member of the same church congregation, a friend of a relative of Moray, and the friends, a couple of times, went into the well-stocked laboratory of Moray, where they saw a confusing array of glassware, a delicate set of scales, bottles of chemicals, all of which appeared to them to be very complex and expensive.

Moray invited the troop over to his laboratory one night for a demonstration of his energy device. He had the machine, about the size of an applebox, set up in the middle of the room. While Moray worked with the machine, the scouts milled around the room. Presently Moray called them over, and had them stand in a circle holding hands. He then had them break hands but hold their hands within a few inches of each other. He then had the lights turned out.

When the lights were out, they could see long sparks streaming off the fingers of everyone in the circle, but the boys could not feel the sparks. In fact, it was not until the lights were out the sparks could even be seen. The boys then walked around the room drawing sparks out of metal objects. When they reached for the doornob, two to three-inch sparks jumped out at them, but again, they could not feel the sparks. Moray only cautioned them not to touch each others' eyes, probably not knowing the consequence of so doing.

The boys thought the experiment "was kind of neat." Moray said he took "electricity out of, or could pull electricity out of the air." He said he could "get energy without expending energy." The eyewitness said the machine had no dial and did not glow in the dark. He said it used thin wire. The antenna leading to it was hung from white or brown ceramic insulators, was at least 150 ft. long, and the two poles from which it hung stood "way over" everything else in the neighborhood--trees, buildings, light poles, and so forth.

The way the machine worked that night reminded the eyewitness of the light he and a cousin could get from their clothesline later on when they lived close to a radio station. By connecting a globe to the clothesline, it would light up.

On another occasion, Moray stood on the street with the eyewitness, and showed him a matchbox-size box with two dials on it. Moray aimed it at a couple of fellows talking on the street about a block away, and their voices could be heard from the box in his hand. There were no wires coming out of the box. Moray explained he couldn't isolate very well what he was picking up.

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A General Description Of The Machine

The energy device of Thomas Henry Moray went through stages of improvement from about 1914 until he died in May of 1974. The first device resembled an old-fashioned crystal radio set with the characteristic external ground and antenna wires. Eventually these wires were eliminated, and the last machine he built had 29 tubes and other components, weighed sixty pounds, was completely portable, and produced 50 kilowatts or more of power.

Over the years, hundreds of witnesses saw the machines, and some of the accounts differ as to what the machines looked like for reasons stated above. Here are some descriptions:

The earliest version consisted of an unpainted brown box (about the size of a butter box) & a smaller fiber box 6" x 4" x 4" containing tubes. All were attached to a metal baseboard 14" x 4" x 1", also having a magnet (two iron posts), a switch in the middle, a receptacle for a light bulb, and several posts to connect wires to attached to it. The machine also had a ground wire and an antenna wire (about 27' long, plus a 10' lead-in).

In August of 1925 the machine components were connected to a small drafting board, with the largest instrument measuring 6" high and 8" in diameter. It had a ground wire, antenna wire, and lighted a 100 watt bulb and a 655 watt flat iron.

In October 1928, the machine was housed in two boxes 10" x 20" x 4" deep. The upper box had an insulating panel on top of it of thick, hard rubber or slate, on top of which was mounted a jaw switch. Next to the switch was a body or device about 2 1/2" square wrapped in friction tape, from which protruded 2 poles of 1/4" soft iron. This taped body was the starting device designed to be stroked with one pole of a permanent magnet. There were also the antenna and ground wires.

The March 1929 version of the machine was still housed in two boxes. In one box was a high frequency transformer, on top of which was the jaw switch and starting device. The other box contained two sets of condensers or capacitors--10 large ones and 10 small ones--a special valve housed in a hemispherical box about 2" in diameter and weighing about 2 ounces, two composition cylinders (oscillator tubes), a coil of wire, antenna and ground wires, and a bank of six 100-watt lights, having a place to hook in a flat iron during demonstrations.

As of October 1930 there were still two boxes 14" x 24" x 4" with the jaw switch on the top one, the antenna and ground wires, 2 soft

iron poles to be stroked with a magnet, and a detector having a flaw causing it to be the weak link in the machine's reliability.

- On December 3, 1930, the observer saw the whole machine housed in one box 10" x 10" x 30". A hard rubber and a metal disc rubbed together started the machine. There were still the antenna and ground wires.

As described in FATE MAGAZINE, September 1956, p.16, the machine then witnessed produced 50 kw of power (67 h.p.), was housed in one box 30" x 16" x 16", and weighed 50 pounds. This machine compares closely with the 1929 version above, and contained a step-down transformer wound 1000 to 1, primary to secondary, had several capacitors of different sizes, still had a "weak link" detector tube or electronic valve, 2 oscillator tubes, 2 coils of wire or inductances 8" and 10" in diameter wrapped with several layers of 50-gauge wire, a starting device, a bar of silver and a bar of copper laid side by side, no antenna and ground wires, and produced a six-inch brush discharge when disconnected at the antenna or ground lead-in while operating.

The 1974 machine had 29 tubes, produced 50 kw or more of power, and produced an 16" brush discharge when disconnected. It had no antenna or ground wires, and the faulty detector had been improved. The antenna had been replaced with a tube.

T. H. Moray was reputed to have camouflaged his device by adding things to it to confuse observers, which were not working parts of the machine, but a careful comparison of his 1929 and 1956 machines reveals he replaced the antenna and ground wires with bars of copper and silver. This finding was later substantiated by the son of T. H. Moray in a recent publication SEA OF ENERGY where it is claimed Moray used copper and silver coins as antennas and grounds.

The demonstrations of the device by Moray almost always followed the same procedures. First, he would string out a 100-foot-or-so wire of heavy copper, supported above the ground by two poles. He would then establish a good ground, such as a cold water pipe or metal stake driven deep into the earth. These steps and the connection of the bank of lights to the machine completed, Moray stroked the two soft iron poles protruding from the box with one pole of a broad, U-shaped, permanent magnet from 5 to 10 minutes (which strongly suggests how the wire was wound on the soft iron poles). During the stroking or "tuning-in" as he called it, he would periodically test the current potential difference between the jaws of the knife switch, causing the bank of lights to turn on immediately and remain burning until the switch was opened again, or the circuit was broken in some other way.

After the lights had burned for a time, Moray usually disconnected for an instant the ground wire, then the antenna wire, quickly connecting them again. During those short breaks in the circuit, a six-inch or longer brush discharge jumped across the breaks. Moray also did other things to show the perplexing capabilities of the machine, such as place sheets of window glass in the antenna circuit to show the apparent short circuit caused by the intervening glass had no effect on the operation of the machine.

The machine was then stopped, and observers were permitted to handle the parts and ask questions which he answered in riddles or in such a general

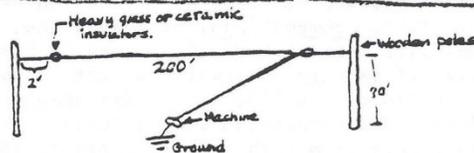
way as to be almost valueless to the inquirer. All the parts except the detector could be handled and tested by those who saw his demonstrations.

Apparently Moray never revealed the real workings of the machine, although he left behind considerable vague, repetitious, and philosophy-laden writings on the subject, unless he revealed it in his voluminous laboratory notes.

The Parts Of The Machine

The most complete part by part description of Moray's device was given by T. J. Yates in March of 1929, and will serve for this moment as the basis of an analysis. That machine had antenna and ground wires, a coil of wire, two sets of capacitors--10 large and 10 small--a step-down, high frequency transformer, two oscillator tubes, and a hemispherical detector tube, in addition to the jaw switch and starting device. All these parts were connected together, and heavy wires ran from there to a bank of six 100-watt light bulbs connected "in multiple."

The antenna was raised above the earth, and the ground was connected to a cold water pipe. Often Moray soldered the ground wire to a metal stake he had driven in the ground. He used a blow torch for that purpose. The antenna at his laboratory in Salt Lake City was made of heavy copper wire, extended 200' and stood 60' above the ground. It was suspended as follows:



Illustrated in
BEYOND THE LIGHT RAYS
by T.H. Moray

Replacing the antenna and ground wires with metal bars or tubes made the device portable. In this manner, he was able to have a potential difference.

The coil of wire was no doubt the inductor working in conjunction with the oscillator tubes which had great capacitance, or in conjunction with the two sets of capacitors mentioned above, which were off-the-shelf and familiar to people versed in the art at that time in 1929. Tests were performed on later machines showing those were not unusual.

The transformer, as Harvey Fletcher described it, was also not unusual looking, but appeared, as he said, to be "the kind we used in our laboratories." It did not appear unique, but Moray is reputed to have claimed it was a step-down transformer. The article in FATE MAGAZINE, September 1956, puts the ratio as 1000 to 1, primary to secondary.)

It is significant to point out here that both the Hendershot generator and Hubbard transformer were a series of transformers and capacitors, almost solely when their real characters are analysed.

The author has built a complete Hendershot generator, and can make it available for inspection.

The Oscillator Tubes

In a letter or affidavit addressed To Whom It May Concern, dated December 18, 1930, Thomas J. Yates stated:

I do not understand the principle by which Dr. Moray produces the electric energy. The condensers and the coils of wire are common. The two cylinders called "oscillators" and the small conical shell called the "detector" are the only things not commonly known.

The oscillator tubes are described by T. J. Yates on May 21, 1929 as two composition cylinders. Checking the words "composition" and "synthetic" in an 1895 and later dictionaries reveals "synthetic" was a word used solely in the language of debate, as in Hegelian dialectics. Therein the thesis, anti-thesis, and synthesis were parts of argument. It was not until synthetic rubber manufacture of the 1940's that "synthetic" came into vogue replacing the older word "composition."

In DRAKE'S RADIO CYCLOPEDIA by Harold P. Manly, published by Frederick J. Drake & Company 1928, "composition" is called by its full name, "phenol composition, moulded," under the heading "Constants, dielectric." This phenol composition class included Bakelite, Formica, Condensite, Celoron, Micarta, Redmanol, Phenolite, and so on. All were products of phenol and formaldehyde.

Used elsewhere in the book EXPERIMENTAL WIRELESS STATIONS by Philip S. Edelman; published by The Norman W. Henley Publishing Company, N. Y. 1922, page 527, "composition" is used thusly:

Core. This may be turned out from hard wood, but since wood shrinks, a rubber, fibre, composition, or even a shellaced paper tube is much preferred....If bare wire is to be used on the fibre, rubber, or composition tube, it is very desirable to turn or have a machinist turn a thread on the core. (p.529) Every part should be nicely made and great care taken with insulation and contacts. The cores and ends used are preferably made from hard rubber, fibre or moulded composition, but wood and paper when dry and carefully shellaced may be substituted. (p.569) ...condensers...paper...glass...air...composition...etc.

In the book CAPACITORS, THEIR USE IN ELECTRONIC CIRCUITS by M. Brotherton, Ph.D., published by D. Van Nostrand Company, Inc., Princeton, N. J. 1946, p.89, a transition in the use of the words "composition" and "synthetic" is shown:

Originally, capacitors of the solid-dielectric type used dielectric materials either immediately employable as found in nature or which can be produced without elaborate chemical transformation....In the meantime, the synthetic chemist has been gradually opening up to us a new vista of possibilities by creating dielectrics of radically new composition, through transformation of the basic molecular structure of natural materials.... Now entering the picture is the possibility of using films of synthetic cellulose which are free from the contaminants present in paper; viscose, cellulose esters and cellulose ethers are steps in this direction....(p.90) Indicative of the possibilities of the class of synthetics known as plastics are the unusual characteristics of polystyrene. (p91) Synthetic dielectrics constitute a new field on the brink of rapid expansion.

In a conversation with Harvey Fletcher, the author asked what material the oscillator tubes were made of. After thinking somewhat impatiently, he stated he did not remember very well. When the author asked him further whether they were made of metal, glass, or plastic, in a split second flash of recog-

dition, he stated unhesitatingly, "Plastic, I believe."

In an old letter written to Harvey Fletcher from the law office of Bagley, Judd and Ray, Suite 409 Kearns Building, Salt Lake City, on October 25, 1928, Robert L. Judd wrote in part:

The enclosed letter we have written with the idea that you might disclose the same to the man whom you select to deal with in this matter. Mr. Moray feels that as a preliminary step you should not disclose the fact that a stone is used in the detector; that there is moisture in the tubes with electro-litic effect, the metal covering of the tubes and the "tuning-in" process. By this limitation we would not have you understand that at some very near future time we will not be willing to have you make a disclosure...

It is hardly probable that Mr. Fletcher would need to have been told the tubes were metal covered if it was evidently so, since many people saw and handled them. The only sensible explanation is that the metal tubes were covered with phenol plastic. The stone in the detector was also not apparently evident. The tuning-in process was seen by many people, and the mystery shrouding it seems peculiar and unnecessary.

The oscillator tubes had a great capacitance, too. In a letter to Robert L. Judd from Harvey Fletcher on October 6, 1928, Mr. Fletcher said in part:

If I saw all the parts that entered into the production of the light I would certainly agree with Mr. Morley (sic) that either the tubes or the rectifier (detector) or the coil had some remarkable properties. As a scientist, I should like to see them investigated in some physical laboratory which is equipped to do such work. If Mr. Morley's statement that the tubes have a capacity of a farad is even approximately true, the tubes alone have a great scientific value.

If the rectifier has only the function Mr. Morley claimed for it, then a substitute can easily be found which is much more stable and reliable.

(2) The energy is transferred from a high impedance circuit to a low impedance circuit by means of a high frequency current. The high frequency is probably produced by an oscillatory circuit in the system and I think tests would reveal that the frequency of oscillations was entirely controlled by the constants of the circuit and not by outside influences. Any attempts to obtain current or voltage readings in the high impedance side of the circuit by using ordinary meters would probably result in failure. This is confirmed by Mr. Morley's experience.

(3) If the source of energy is within the system, by redesigning the system the same performance can be obtained without the use of an antenna.

(4) If the rectifier has only the function Mr. Morley claimed for it, then a substitute can easily be found which is more stable and reliable.

In his patent, number 2,460,707, an electrotherapeutic apparatus, Moray included some peculiar capacitors, having great electric capacitance. Why they are in the patent at all makes little sense, unless he was taking the opportunity to patent parts of other devices, particularly those of his energy

device. At least up to the early 1930's, Moray did not seem to think any part of his energy device was as important as the detector, and permitted people to handle all parts freely, except the detector which apparently acted as a rectifier, along with being an ultra-sensitive detector, a point to be discussed later.

Based on information the author has, Moray's oscillator tubes had much the same function as the hand-wound capacitors and basket coils of Hendershot's generator--a one-piece, closely-matched and balanced effect. Figure 14 and 15 seem to most nearly answer witnesses' descriptions of the oscillator tubes (See patent):

(column 7) In the illustrated instance, the governor or control device 69 preferably takes the form of a vacuum tube having the construction shown by Figs. 14 and 15, Figs. 16 and 17, or Figs. 18 and 19. These tubes all possess high capacity and include elements effecting a brush discharge. They serve as does the device 14 of Figs. 2 and 3.

The tube of Figs. 14 and 15 embodies an outer shell or envelope 70 of insulating material such as glass, a plastic or fiber coated with shellac. Inside the shell 70 is a bi-cylindrical element 71 formed of electrically conductive material....

(column 8) I have also found it advantageous to fill the tube with a moist vapor. The tube acts as an oscillator for electric currents and has an enormous capacity, a capacity many times that of a condenser of approximately equal size.

Perhaps all these tubes have parts to contribute to the construction of the actual oscillator tubes used by Moray in his energy device, but seven (or more) things are known about the tubes of the device. They were plastic covered; they were metal covered; they had a great capacitance; they were filled with a damp vapor; they had an electro-litic action; Moray said they used an "ionic" action; and he said they used "cold cathodes." *Radioactive*

Figures 14 and 15 above have a filament to be heated, which seems overly simple for Moray's way of designing. That might suggest a replacement for a more elaborate or exotic element serving essentially the same purpose has been made.

Some ideas as to what may be happening of an electrolytic nature in the tubes may be suggested by these quotes:

(p.35) Chemical reactions at surfaces, oxidation of moist phosphorus, potassium, sodium, give ions of both signs, but more negative ions.

(p.40) These detector tubes have a synchronized pull with the specially developed oscillators of high faradic capacity and provide a means through which oscillating energy may pass to specially constructed valve oscillators. Just as sodium, potassium, caesium, rubidium, barium, strontium, react to visible light, or let us say wavelengths, within a certain range, might not certain substances or substance react to oscillations from the cosmos or artificially produced radiations.

(p.27) It is not to be supposed that the electrons in a polarized atom need to be disturbed in any great amount in order to produce chemical cohesion, polarization converts molecular force in cohesion into insipid but real chemical affinity.

*(p.45) In some electronic tubes the electrons are not emitted directly from the filament but from an indirect cathode which does not enter into

the direct electrical function of the tube. Does this teach us anything towards an indirect generation of ions and ionic action? Could the opposite deflection of alpha and beta rays and the undeflected course of the gamma rays teach us anything about cosmic energy or radiant energy valves and oscillators?

(p.46) R. E. tubes possess greater ability to obtain "saturation" and thus charge the accompanying capacitors or condensers at a more steady rate which, when a certain voltage is reached, ionization occurs in the gases of the discharge tube.... *Argon - Radioactivity*

(p.50) It is now nearly seventy years since Dr. LeBon proved by experiment that the phenomenon observed in substances termed radioactive--such as uranium--could be observed in all substances in nature, and could be only explained by the dissociation of their atoms.

(p.81) ...vapor of water, which in extremely small amounts play an important part in various reactions--dry acetylene and hydride of potassium, carbonic acid and hydride of potassium, ammonia gas and hydrochloric acid, quinine salts and a small amount of water (becomes phosphorescent and radioactive)...

(p.82) The catalyzing substances could therefore be simply liberators of energy in matter on the earth and in the universe.

(p.250) On closely examining the role of bodies whose mere presence influences reactions we note that they behave as if energy were transported from the catalyzing body to that catalyzed. (THE SEA OF ENERGY IN WHICH THE EARTH FLUATS by T. H. Moray)

(p.209) It is a system utilizing the principles of the wire corona with a concentric cylinder at different pressures. The system is modified in conformity to the concept that chemical reactions must take place when the oppositely charged molecular ions from an appropriate activated catalyst are accelerated against one another in the wire corona. It consists of a cylinder made of a suitable catalyst from which positive atomic ions are emitted. The reactants (gases) streaming through the chamber parallel to the length of the wire attain the polarity of the negative molecular ions by the high electric field close to the wire. As these negative molecular ions are accelerated at the right angles to the wire in the direction of the electric field toward the positively charged catalyst cylinder, they are met by an avalanche of onrushing atomic ions from the catalyst. A certain amount of reaction takes place in that instant, 10^{-3} sec. However, some of the negative molecular ions outside the mean free path of the positive atomic ions are free to rush headlong toward the positive cylindrical field where they are neutralized, and instantly given a positive charge by the avalanche of outrushing positive ions. These positive molecular ions are accelerated back into the field and collide against the negative molecular ions coming from the direction of the negative electrode corona. This melee continues until the reaction has come to a point where the individual participants are either all gone or the mixture is outside of the electrical field: backrush oscillations.

(p.224) Any action capable of modifying the nature of a body generates electricity. (Simple contact between two heterogeneous bodies generates electricity.)

(p.211) Energy must be absorbed to be utilized. (The energy has to be converted to light, heat, chemical, mechanical or electrical energy.) (SEA OF ENERGY, pub. Cosray Research Inc., 2505 So. 4th E., SLC, Utah)

The sense the author gets from thinking about the principles the machine operates on is that of cutting down ohmic resistance mainly in the oscillator tubes and rectifier or detector. This may be attained by keeping the gas inside the oscillator tubes in a metastable state through phosphors or other kinds of radioactivity, so that the slightest additional energy causes current to flow unimpeded. FATE MAGAZINE, Sept. 1956, p. 16+, rumors that radioactive materials were used as the "carrying currents" in his tubes. Moray said:

If the internal impedance is too great, there will be no oscillations, but it will merely slide back in a dead beat to its unrestrained state. Cutting down the resistance to the minimum and by synchronous or resilient ionic actions of the device with the ionic actions of the universe.

With negligible resistance in the device, no energy is lost in heat and the oscillations continue...(SEA OF ENERGY IN WHICH THE EARTH FLOATS)

Another phenomenon, no doubt related to the operation of the device in some way, possibly in the oscillator tubes, is that of separating positive and negative ions from each other in gas. By rapidly alternating a field between two plates emersed in an ionized gas, the negative ions will reach the positive plate, but the positive ions, being much slower and heavier, may never reach the opposite plate.

Moray says the electric field is one of the most important ionizing agents:

A specific case in which the electric field performs the double function of molecular excitation and the creation of inter-molecular and atomic ions is being given as the system used by the inventor...

Flames discharge electrified bodies without anyone determining the exact cause of this phenomenon. The loss of electric charges through the influence of light has been known for years but was regarded as a fact peculiar to a few metals with no suspicion of how general and important this law is.(SEA OF ENERGY IN WHICH THE EARTH FLOATS)

Of course, electrolytic action could mean just that. A damp vapor such as water could effect one electrode in a tube in such a way it dissociates slowly, the current then flowing toward the other electrode. Some examples of possible substances have just been given.

From PHYSICS OF ELECTRON TUBES by L. R. Koller, published by McGraw-Hill Book Company, Inc., N. Y. 1954, the following information on cold-cathode tubes is printed:

(p221) The cold-cathode diode is a tube containing two electrodes immersed in a gas at a relatively low pressure, commonly about 0.1 mm of mercury....

The principle uses of cold-cathode diodes are as voltage regulators, stroboscopic light sources, relaxation oscillators, surge protection devices, and as transmit-receive (T-R) switch devices in radar systems (see Sec. 16-3). Such tubes can also be designed to operate rectifiers.

The cold-cathode diode is sometimes provided with an auxiliary electrode to which a d-c potential is applied of sufficient magnitude to maintain ionization continuously in the tube. When this is done, the breakdown voltage is reduced, and breakdown takes place more rapidly than otherwise. Cold-cathode diodes with such an auxiliary electrode find use as transmit-receiving switching devices in radar systems.

The Detector

Moray's energy device would function without the detector, so: it is reported in a letter from E. G. Jensen, 914 Continental Bank Building, Salt Lake City, on September 26, 1928 to Reed L. Anderberg, 215 West 7th Street, Los Angeles, California:

Dr. Moray stated it would work without the detector but that the light was not constant and that it was bright and dim in regular cycles.

This testimony is substantiated by Moray's pride in and emphasis on the steadiness and brightness of the light in his literature and speeches about his machine. Harvey Fletcher refers to the detector as a rectifier in the previously quoted letter written by him to Robert L. Judd, dated October 6, 1928. He must have been told it was a rectifier by Moray.

The first detector, according to Moray's son, in a recent book, SEA OF ENERGY, published by Cosray Research, Inc., was a piece of naturally occurring stone taken by Moray from a loaded railroad car in Sweden, and brought by him to the United States. (C. R. Henzel of Washington, D. C., writing to Harvey Fletcher on March 30, 1933, said:

Mr. Moray was unable to give me a demonstration of the device because he said he didn't have any more of the stone or piece of material which belongs in the detector, which seems to be a very important part of the device, but he says he can make a tube to take the place of this material.

When that stone was exhausted or used up, Moray fabricated a stone to replace it. The stone he made with the help of large railroad yard presses in Salt Lake City was made mainly of germanium and doped with small amounts of radioactive materials, discussed later on here, which gave it an extraordinary sensitiveness to a large spectrum of electromagnetic waves, from radio waves to something akin to cosmic rays.

Materials tend to absorb the wavelength of the same waves they emit. Moray said:

Just as sodium, potassium, caesium, rubidium, barium, strontium, react to visible light, or let us say wavelengths, within a certain range, might not certain other substances or substance react to oscillations from the cosmos or artificially produced radiations? The relationship and combination of natural and forced vibrations is particularly important. It must be remembered that a point of resonance will be reached at some frequency and the charge will reach a magnitude depending on the impressed force which, in the case of the universe is immense--the effect of resonance, pure resonance.

It made sense for Moray to use a combination of radium, thorium, and uranium in his detector, because per unit measure, Ernest Rutherford, in his book RADIO-ACTIVITY, published by Cambridge University Press in 1905, points out that those three elements together ionize nearly twice as much gas as any one of the three will ionize alone.

The October 7, 1916 issue of SCIENTIFIC AMERICAN SUPPLEMENT, p. 353, carries the article "Radium And Aerials" wherein experiments with a weak

solution of radium in conjunction with radio aerials are made. The results show that the close proximity of the radium to the antenna or tuning coil greatly increased the receptivity of the radio, even in circumstances where no stations could be received before.

The author's own experiments have yielded similar results. When a piece of uranium is held close to the tuning coil of a small transistor radio, a small increase in volume is audible. It is especially true if the ore is held next to the air capacitor of the radio if the radio is not tuned directly onto the radio station being received. Only ore was used.

In the translation from French by Pierre Beasse, called PHYSICAL RADIESTHESIE, published by Progres scientifique in Nice (A.-M.) France 1941, that author asserts a radioactive body greatly increases the sensitivity of dowsing pendulums and rods by making the object sought after appear much larger than it is.

An exceptionally important use of radioactivity in detecting electromagnetic waves was developed during World War II. THE BOYS' FIRST BOOK OF RADIO AND ELECTRONICS by Alfred Morgan, published by Charles Scribner's Sons, New York, October 1963, page 33 records:

The Snooperscope is intended for the detection of infiltrating enemy troops and reading maps at night. One model utilizing radium in its construction is so sensitive it can detect a camouflaged tank by its engine heat hours after the motors are shut down.

Further, the following was published by Little, Brown, and Company, Boston, 1948, edited by C. G. Suits and others, and entitled APPLIED PHYSICS: ELECTRONICS, OPTICS, METALLURGY, pp.228-276)

(p. 235) An infrared-sensitive phosphor is a material which stores up energy when bombarded by ultraviolet light, visible light, electrons, X-rays, alpha rays, and other energizing agencies. The stored energy is normally released very slowly over a long period of time. If, however, the phosphor in its excited state is subjected to illumination by infrared radiation, the energy is released much more rapidly and in the form of visible light. This phenomenon is the basis of the metascope, which first excite a phosphor surface, and then stimulate it by infrared radiation to provide a visual image.

...Each phosphor has a characteristic excitation spectrum, a band of wave lengths which causes it to store up energy. Energy storage is influenced not only by the peculiarities of the phosphor, but also by the amount and manner of excitation, which in some cases is quite critical and must be carefully controlled.

In addition to its characteristic excitation spectrum, each phosphor has its own stimulation and emission spectra. The stimulation spectrum for available infrared-sensitive phosphors is in the near-infrared region, just beyond the visible light spectrum. The emission spectrum lies between the wave lengths of excitation and stimulation. After excitation, the stored energy in the phosphor is released in two principle forms. The first is a spontaneous visible afterglow which is strong immediately after excitation, but becomes negligible in a few minutes or hours depending on the phosphor. The second is a stimulated emission due to irradiation by infrared, and it is this form that is useful for infrared detection and viewing.

(p.238) More than 20,000 new preparations were tried in the search for phosphors with stimulated bands at longer wave lengths. Greatest success was obtained with types of zinc sulfide, in respect both to the brightness of stimulated luminescence and also to the displacement of the stimulation band further into the infrared. While no practical phosphors of this composition were developed, the investigation indicated a likely field for future research.

(p. 240) Type F metascope used Standard VIII phosphor, an improved version of Standard VI, a calcium-strontium mixture activated by europium and samarium, excited by alpha particle bombardment from gold foil made radioactive by radium. The foil was brought close to the phosphor by tilting the instrument, then swung behind a barrier. The beta-rays striking the phosphor from behind the barrier continued as "trickle charges" to maintain the excitation. The instrument's sensitivity five minutes after excitation was 40 nautical-mile-candles and about 6 nautical-mile-candles one hour later.

(p.243) As the increased sensitivity of electron image tubes made possible the fabrication of smaller telescopes, two spectacular applications of infrared imaging--the snooperscope and sniperscope--were developed. Each of the instruments was essentially a combination of a small image-tube telescope and a 30-watt sealed-beam spotlight provided with a suitable infrared filter.

From this publication it becomes evident much work on phosphors has been done. Particularly interesting is the reference to zinc sulfide, a material used in Moray's detector. Ernest Rutherford used this material much in his experiments, as it is a sensitive piezoelectric crystal.

It should be pointed out the background work on the Snooperscope has just been revealed, not its detailed workings which may be more informative.

Another material in the detector is bismuth, a natural electronegative metal, as barium is naturally electropositive. Bismuth was used by Rutherford (RADIO-ACTIVITY, pp. 397-455) to collect the alpha-particle-rich emanation of radium from chemical solutions, simply by dipping it in the solution. Bismuth is naturally slightly diamagnetic, and becomes strongly radioactive when exposed to active matter in radon.

Stone 139 of the detector was 3-4°C above ambient temperature, making that stone out of equilibrium with its surroundings. Rutherford points out (Ibid. p.430) the heat of radium is proportional to emissions of α particles, that the emanations account for 2/3 of the heat, and that the greatest energy of ionization comes from alpha particles.(Ibid. pp. 418-420) The emission of heat is directly associated with radioactivity.(Ibid. p.443)

Rutherford points out that the horsepower and energy of radium, thorium, and uranium are enormous (Ibid. p. 432), and the energy is radiated in the form of ionizing rays into gas (Ibid. 438). Each alpha particle ionizes 66,000 ions in gas before being absorbed, and each alpha particle is stopped in 3 cm of air. An alpha particle traveling slower than 10⁶ cm/sec. fails to ionize gas.(Ibid. p. 455) Radium is 100,000 times more active than uranium. (Ibid. p. 432)

Copper and silver absorb the emanation of radioactivity best.(Ibid. p. 397) Moray said:

Did these pioneers (Rutherford, Curie) build better than they realized in showing the way? It could prove profitable if these experiments of Rutherford and his co-workers were taken up again.(THE SEA OF ENERGY IN WHICH THE EARTH FLOATS, pp. 75, 77)

Moray said the most significant thing about radioactivity is the production of alpha particles. He rehearsed the findings of other scientists that they account for 99% of the radioactivity of radium. They render air a conductor of electricity. When a radioactive body is enclosed in a glass tube, all the alpha particles are stopped by the glass walls, but "inside those walls great things take place because of their electrical conducting ability. The emission of alpha particles, positive ions, is together with the production of emanation (radon gas) the fundamental phenomenon of radioactivity." Moray went on to say, "Radioactivity and cosmic energy are very closely related--one points toward the other"

Experiments in the early 1900's found that radium immersed in water caused hydrogen and oxygen to separate from the water, making it possible to claim the energy of hydrogen again by burning it. As Moray said:

None of these alpha-beta-gamma emissions can touch a gaseous or solid body without immediately causing, no doubt through disturbance produced by their enormous velocity, a dissociation resulting in the production of secondary rays, which are similar in their properties to the primary rays, but less intense.

Light and other radiations exert a mechanical pressure upon everything and object they strike and these radiations are essentially electrical in their character. There is a breaking down and building up of the atoms continuously producing...unlimited power...

Nikola Tesla said the same thing when he realized X-rays were particles striking objects in their paths with great, but inaudible reports like gunshots.

Moray's maintained claim the emission of alpha particles is the most significant thing about radioactivity means the ionization of gases and radioactivation of other elements in their path are the most significant things about alpha particles.

Confined in the half-spherical, air-tight detector case, the alpha particles, and other radioactive products were placed in an excited state or state of imbalance. If radioactivity is being off balance nuclearly, then the elements exposed to radiation are knocked off-balance, and begin to give off emissions, too. Ions free electrons which can be drawn off and conducted in a wire. The positive charged alpha particles remain, but a demand for negative electrons is present. The antenna and ground supply the electrons which are only drawn off again.

Another explanation is that while the materials inside the detector are slightly off-balance, they will absorb energy of the wave length they give off, as well as other wave lengths. In this case, nuclear materials give off gamma rays, beta particles, and alpha particles, so the detector will absorb these energies, at least detect, rectify, and amplify them.

At anyrate, a jolt or shock was created, or a dearth of a charge was maintained that was not compensated for, if a load was on the machine while it was properly hooked up, so the machine continued to run until stopped by some outside means already mentioned.

It is plausible the stroking of the coil or its equivalent filled the capacitors. By closing the switch, the jolt of electricity given off by the capacitors caused the machine to start oscillating, picking up additional power from the atmosphere, but the machine was actually running when the jaw switch was open, as it could be opened and closed, the lights corresponding to it, once the machine was tuned in.

More About The Detector

Around 1902, the rays given off by the newly discovered radioactive materials were referred to as radiant energy, and were specifically what are known today as alpha, beta, and gamma rays or particles, as well as light, cathode rays, Roentgen rays, X-rays and ultraviolet light. It was also known that they had an electrical nature because of reactions (or non-reactions) to magnetic fields. In this regard, beta and gamma rays were similar to cathode and X-rays respectively. Alpha particles were similar to helium nuclei. (Annual Report Of The Smithsonian Institute, 1902, pp.197+)

The Curies started the rumor that radioactivity is the evolving of matter or atoms. (Annual Report of the Smithsonian Institute, 1908, pp.769+)

Thomas Henry Moray of Salt Lake City, prior to his death in 1974, perfected a machine which would take energy from the atmosphere based upon the workings of radioactivity. Indeed, he called it his "radiant energy device."

Just how the machine worked was a very great secret, but based on his writings, I believe the principle of its operation can be deduced. This deduction would include the need for much outside research.

Basically, it was a system wherein the current supplied from an initial start reciprocated back and forth in condensers, gaining power from the atmosphere. This current was fed from the atmosphere through a detector made of nuclear materials. There were several seemingly simple parts, such as oscillator tubes (2), some condensers, a coil of wire, a switch, other simple parts, and a detector.

First the detector. Old crystal detectors were any of a number of materials, usually sulphides of metals, among which are bornite, chalcocite, chalcopyrite, galena, iron pyrite (fool's gold), molybdenite, and stibnite. These materials acted as diodes which prevented the incoming sine wave signal from flowing both directions through the circuit, that is, from alternating.

These old detectors had, in addition to the piece of material that acted as a diode, a part known as a cat whisker. The cat whisker was a stiff, thin piece of wire, usually with a coil or two in it to give it spring, and the end of it was placed delicately on a point of the material acting as the crystal. Usually this adjustment was very sensitive, and for this reason, the detector must not be jarred or disturbed.

Moray's device had a similar part which he called the detector, which had the same sensitivity to being jarred, for in a letter to a Mr. Haffeneffer, Robert L. Judd states:

A later examination of the parts of the machine showed that one part of the detector, that piece of the mechanism which is not yet "fool" proof, had slipped down out of place and in affect had disconnected that particular circuit.

(A Brief Analysis Of The Moray Radiant Energy Device, Sept. 20, 1928, p.10.)

E. G. Jensen further states in his letter to R. L. Andberg, October 8, 1928:

... October, 4, 1928, that the light was out. He stated that large poplar trees were being toppled near his laboratory and that in dropping to the ground the tops shook the ground sufficiently to throw the detector out of adjustment....

At 6:30 p. m., October 4, 1928, with Moray, Hayes and Jensen present, seals were inspected and found to be O. K. Seals were then broken, the trunk lid raised, and the cover to the top box unscrewed and taken off and the detector taken out. Mr. Moray shook the detector gently and we all heard a rattling sound, which Mr. Moray pronounced as the part of the detector jarred out of position when the tree fell. Mr. Moray further stated that he thought he could adjust it quickly and started to do so immediately in the laboratory and in our presence. The detector was pronounced O. K. and ready for installation and further demonstration at 6:53 p. m. (Ibid, p. 13.)

The detector was described as "... a box approximately hemispherical in shape about 2 inches in diameter and weighing about 2 ounces...." (T. J. Yates, recorded March 16, 1929) The whole machine, he also relates, consisted as follows:

1. The apparatus consists of an antenna, a lead-in and a ground wire. These are connected to the terminals of a switch. Two wooden boxes were placed on a table. In one of these boxes was a high frequency transformer and in the other box were two sets of condensers, 10 large condensers in one set and 10 small condensers in the other set; two composition cylinders, each about $1\frac{1}{2}$ inches diameter and four inches long; each of these weighed about three or four ounces; and another box approximately hemispherical in shape and 2 inches in diameter and weighing about 2 ounces; and a coil of wire. These pieces of apparatus were connected by a number of wires by which the hook-up was connected.

Two of these wire were led out to the switch. One was attached to the blade of the switch and the other to the jaws of the switch so that when the switch was open the antenna, lead-in, apparatus in the boxes, and the ground wire, were all in series.

Two other wires leading out of the box were connected to six 100 watt lamps connected in multiple during part of the demonstration, and to a flat iron during part of the demonstration.

2. Demonstration. During the demonstration the apparatus was connected in series as above described, except that a small switch connected in series with the coil was left open.

Dr. Moray stroked the coil with a small magnet for three or four minutes; He then closed the small switch and the lamps were lighted and remained bright as long as the circuit was left closed, which was about 60 minutes. He then connected an electrical flat iron. In

a short time the iron was hot. When the ground wire was disconnected the lights went out.

Others saw the contents of the box:

The boxes in which the mechanism had been housed during the test were opened and the contents examined; there were condensers, the detector, a transformer, and two tubes in them but nothing else. Nothing that in the least resembled a battery. (Murray O. Hayes, October 29, 1928)

I examined most of the apparatus which was used consisting of condensers and coils of wire which could produce no energy themselves, but the detector (so called) a small instrument which completed the apparatus was not shown to me, neither was the principle of operation disclosed. (Nathaniel Baldwin, October 1, 1931)

The essential parts of the machine were contained in two boxes. one directly on top of the other, each box about 14" wide and 4" deep by 24" long. On the top of the upper box was an electric switch on an insulating base. There was also attached to the upper box two soft iron poles wound with wire which in turn was covered with ordinary friction tape. Ten standard electric light globes, each 100 watts, were connected to the interior of these boxes. A heavy copper wire led from one of the boxes to an outside aerial, a second similar wire connected the boxes with a water pipe going into the ground. Several members of the party took hold of both wires at the same time which showed there was no current in them before the demonstration began. Dr. Moray also put the terminals of the connection which led into the boxes in his mouth to prove that there was no current in the boxes.

... when it was "oscillating" in tune with what he called "radiant energy" it would continue so to do and bring in this energy in a usable form when the switch was closed. After this stroking had continued for a few seconds less than five minutes, Moray closed the switch and the lights came on very brilliant.

The inventor explained that this astonishing exhibition when understood was a matter of ordinary physics and predicted that there could be developed from the energy all about us power and light and heat sufficient to take care of many times the present known needs of man. (M. H. Welling, Secretary of the State of Utah, October 8, 1930)

One person described the detector as small enough to fit in a man's hand and remarked that Moray cut it loose from the machine after the demonstration and put it in his pocket.

Moray hints at the way the machine works by references to Rutherford, Le Bon, etc.:

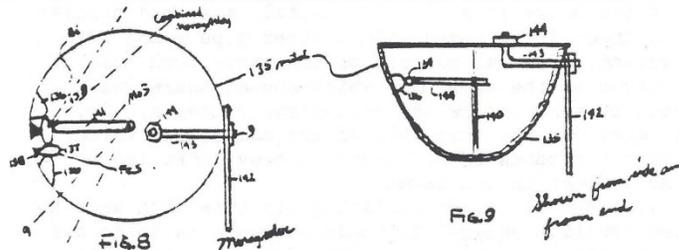
... The Alpha radiations are composed of positive ions, the Beta radiations of electrons with those constituting the cathode rays, while the Gamma radiations are similar to the X-rays. Did these pioneers build better than they realized in showing the way? (T. H. Moray. The Sea Of Energy In Which The Earth Floats, p.75)

...Of all the emission of radioactive bodies, it is the Alpha particles especially which make the air a conductor of electricity, and it is the Beta particles or rays which produce photographic impressions. When a radioactive body is enclosed in a glass tube nearly all the Alpha particles are stopped by the glass walls but inside those glass walls great things take place because of their electrical conducting ability. (Ibid, p.75)

The emission of Alpha particles, positive ions, is together with the production of emanation [gas], the fundamental phenomenon of radioactivity. (Ibid, p.76)

It could prove profitable if these experiments of Rutherford and his co-workers were taken up again. (Ibid, p.77)

It appears Moray's valve is the detector he applied for a patent on dated July 13, 1931 (pat.app.No. 550,611) and shown on page 132 in The Sea Of Energy In Which The Earth Floats:



It is logical the detector would be the part of the device he would attempt to patent, because he allowed other people to handle the other parts, and see diagrams to circuits of the rest of the machine.

Further, its shape is an approximately hemispherical, two-inches-in-diameter metal box, fully enclosed, including a screw-on lid, such that it can be disassembled.

On page 131 of the same book (Ibid), reading from the patent application, he admits it will pick up cosmic signals:

This, with variations and hookup shown in figure 10, as used for the rectification and amplification of radio or other high frequency signals without the application of any outside current other than the incoming radio or cosmic signal and small pencil sized dry cell batteries. Certain hookups require no battery cells whatsoever. *See photostat patent application #550,611.

On page 130 of the same book (Ibid), reading from the patent application, he names the materials used in each part of the valve until he comes to the part numbered 139:

At 139, in the form of a rounded stone, is a small mineral body containing _____ (material blanked out in this paper for security reasons but can say it described the Moray fission material) triboluminescent zinc and germanium compressed into a hard, rounded stone. This rounded stone is delicately supported between the pieces of iron sulphide 137 and the upper piece of bismuth 136. The stone 139 has remarkable amplifying and rectifying properties, is also remarkable for the maintenance of a higher temperature than exists in its surroundings, as well as for its radiation of alpha, beta, and gamma rays which produce an ionic reaction. It is by reason of this latter property that this stone readily ionizes gases. It will be understood therefore that this stone may well serve as a valve which allows energy waves to pass in only one direction at a time, that is to say, from the antenna capacitor into various circuits or from the circuits into the antenna capacitor without necessarily changing from H. F. or A. C. to D. C.

On the larger handwritten note shown on page 135, the materials are also blanked out, but the commas remain, indicating there were three different materials missing, but there is good reason to assume these materials were, first, some form of radium, perhaps radium chloride:

To these emanations are due three-fourths of the heat continually produced by radium, which maintains its temperature 3° or 4° c. above its surroundings. (Ibid, p.80, also pp.73, 76, 135)

The other materials are most obviously thorium and uranium, first because they have the longest half-lives of the three, and second, because they give off different levels of energy emanations:

Radium and thorium produce different energy levels of emanations, that is, of dissociations. Five or six have been counted. The first engenders the second, and so on. They, no doubt, represent successive stages in the evolution of matter. (Ibid, p.80)

It is supposed, from various calculations, that the Alpha particles must have a mass equal or superior to that of the hydrogen atom and a like charge. Their speed, as calculated from the extent of their deviation by a magnetic field of given intensity, is one-tenth that of light. For uranium and thorium, it is for one gramme 70,000 per second, and for radium a hundred thousand million. This emission may last without interruption for more than a hundred years. (Ibid, p.76)

The uranium and thorium could be in the form of salts, but the pure metals give off more radioactivity simply because of concen-

tration of radioactive material, than do the salts.

The stone containing all these elements or materials was hard and "delicately supported" between two other parts of the valve. It is likely this is the part that was jarred out of place when the machine was jarred by a falling tree, dropping something on the table next to it, or hitting the table next to it with a hammer, as Moray did on one occasion during a demonstration. It would also rattle, when out of place, against the sides of the metal box or "envelope" it was in. (Ibid, p.131 bottom of page) This valve could also be disassembled and reassembled in twenty minutes.

The stone number 139 was made, then, of the following materials:

(1) germanium (used because it takes less current to activate it, as opposed to silicon), (2) triboluminescent zinc--in the writings of Rutherford and others, this is zinc sulphide, (3) radium chloride, thorium, and uranium. All these were pressed into a hard ball.

This valve is not to be confused with a solid "valve" used to pick up radio signals, composed of these same materials as an impurity added to germanium. (Ibid, pp.128, 130 top of page, 135)

The other parts of the valve are: (Ibid, pp.130-131)

#135--metal envelope.

#136--Bismuth attached by fusing a portion of the surface of the bismuth and applying it to the case.

#137--A piece of iron sulphide (iron pyrite) may be attached to the bismuth by fusing, the said iron sulfide, however, being insulated from the case 135 at the point 138.

#138--It is also advisable to use, at the points 138 between 136, 137, and 139, portions of germanium which has some very unique properties in the function of the valve when used as a booster or amplifier.

*Germanium compound mixture is the following materials: bismuth, zinc sulfide, iron sulfide (sulphate?), radium, uranium, and thorium (with possibly, but not necessarily, molybdenum sulfide or molybdenum metal used alone with germanium as its impurity) added as impurities into germanium. (Ibid, pp.128,129,130,131,133)

#140--Extending into the case 135 but insulated from it is a metal pin 140, this pin being connected to the antenna lead-in and carrying a piece of molybdenite (molybdenum sulphide, or a molybdenum metal combination of Moray mixture of the germanium alloy or molybdenum germanium alloy).

#141--Molybdenum germanium alloy which contacts stone #139.

#142--A wire 142 connects the base of 135 with the various hookups hereinafter mentioned.

#143--An arm 143 extends through case 135 and furnishes a support for the wire 142 while at the same time it is provided with an upturned portion having a nut 144 threaded thereon for the purpose of securing a tight covered sealed plate over the otherwise open mouth of the case 135.

#144--Upturned, threaded wire or bolt for keeping a tight lid on the case.

Those parts fused to one another could be attached with sulfur.

Inside the Moray valve, the stone 139 instantly ionizes the enclosed air, something that would not take place in a vacuum. The alpha particles do this as they are given off, creating many free electrons. The stone also glows under the bombardment of the alpha particles contained in it. Alpha particles cause zinc sulfide to glow. There are negative beta particles, and gamma rays given off. The other materials--the bismuth, iron pyrite, and germanium mixture are effected by the radioactivity inside the box. They become radioactive themselves.

* Gamma rays are absorbed by bismuth, as used in Geiger counters. Bismuth is also closely akin to polonium in its structure. In fact, polonium is sometimes called active bismuth. All the materials inside take an induced radioactivity. There will be at least one sulfide, the iron sulfide, or iron pyrite. This acts as detector for radio signals, but in an excited state, it intercepts cosmic frequencies.

The weak cosmic signal is amplified just as a radio signal, and since this valve does not convert the signal to direct current, as most diodes do, but allows it to flow both directions, apparently one direction at a time, the current can be alternating.

For this reason, a positive charge or inversion in the incoming signal can go through to the naturally negative earth and return from the earth through the same circuit--alternating.

Also, the free electrons in the detector can be drawn off.

The condensers are filled by stroking the coil and when enough current is built up, the small switch on top is closed, allowing the current to jump suddenly to another set of condensers. The original pulse is then fed by the incoming power and the excess not necessary to keep the machine running is fed through a work circuit. The current runs back and forth, oscillating through the circuit.

Nicola Tesla

Nicola Tesla, who also built a radiant energy device mentioned and described in a patent, had the following to say:

There is no doubt that with the enormous potentials obtainable by the use of high frequencies and oil insulation luminous discharges might be passed through many miles of rarefied air, and that, by thus directing the energy of many hundreds or thousands of horse-power, motors or lamps might be operated at considerable distances from stationary sources. But such schemes are mentioned merely as possibilities. We shall have no need to transmit power at all. Ere many generations pass, our machinery will be driven by a power obtainable at any point of the universe. This idea is not novel. Men have been led to it long ago by instinct or magic. It has been expressed in many ways, and in many places, in the history of old and new. We find it in the delightful myth of Antheus, who derives power from the earth; we find it among the subtle specula-

tions of one of your splendid mathematicians, and in many hints and statements of thinkers of the present time. Throughout space there is energy. Is this energy static or kinetic? If static our hopes are in vain; if kinetic--and this we know it is for certain--then it is a mere question of time when men will succeed in attaching their machinery to the very wheelwork of nature. Of all, living or dead, Crookes came nearest to doing it. His radiometer will turn in the light of day and in the darkness of the night; it will turn everywhere where there is heat, and heat is everywhere. But, unfortunately, this beautiful little machine, while it goes down to posterity as the most interesting, must likewise be put on record as the most inefficient machine ever invented!

The preceding experiment is only one of many equally interesting experiments which may be performed by the use of only one wire with alternate currents of high potentials and frequency. (Lecture before International Electrical Engineers in February 1892, on Experiments With Alternate Currents Of High Potential And High Frequency, p. 71.)

Nicola Tesla's apparatus for the utilization of radiant energy, patent number 685,957, dated November 5, 1901, uses the rays of the sun or a roentgen tube (x-ray) falling on a polished metal surface to charge a condenser. It also has a ground wire connected to earth.

The Source Of Energy

In the October 1980 issue of POPULAR SCIENCE MAGAZINE, p.88+, the article "The Clock That Splits Seconds--Into Trillionths" discloses interesting phenomena of ionized gases. By means of electromagnetic waves hydrogen gas is ionized and received into a quartz-glass chamber. As the disturbed atoms fall to a lower energy level, they do so in lockstep precision and unison at such an exact frequency this clock developed by NASA is more accurate than caesium clocks. A coil located outside the chamber picks up the waves emitted as the atoms lose energy and conducts the pulses to a computer-counter. When the atoms emit their electromagnetic waves, they also emit some visible light!

In the hydrogen maser, the swing of pendulums is replaced by oscillations of hydrogen atoms...The atomic oscillation--the modern equivalent of a pendulum--takes place in this chamber. 'It's unstable in there...The atoms want to get to the lower state.' But for a fraction of a second, nothing happens. Then one atom at random drops, like a marble rolling off the rim of a well, into the lower state. The result is controlled pandemonium. The fall of one atom sets off millions of other falls.

'It's like an explosion or avalanche...As the atoms change their states and give off energy, new atoms enter the chamber to take their place...the atoms begin to oscillate, separately at first and then all together...

To explain why this frequency develops, Reinhardt drew a picture of a small lake, its surface dotted with boats, each carrying a spinning top. 'The top is the internal vibration of the atom,' he said. 'The boat is the whole atom.' The energy of the identically made tops aboard each boat sets up waves in the water.

'Every time the waves come along, the top tips a bit yielding some energy to the wave. After a while, if the tops are all made the same, you get a steady sloshing back and forth. Then you measure the frequency of the wave at one end of the pond.' In the hydrogen clock, a small coil at the top picks up the oscillation and conveys it to an electronics package that counts the pulses and tabs them up into seconds.... 1,420,405,751-and-a-fraction cycles, one second....

SCIENCE DIGEST, August 1980, p.88, gives the frequency of the caesium clock as 9,192,631,770 cycles per second. That appears to be a molecular frequency.

Air or any other gas enclosed in a tube with an ionizing radioactive material emits at least two frequencies of energy. One is visible light, and the other is an electromagnetic frequency like the hydrogen gas above.

When cosmic particles strike the gases of the earth's atmosphere, the gases so excited or so knocked out of equilibrium seek a lower energy state, losing their energy in lockstep unison:

(p.39) When energetic particles penetrate the atmosphere, they lose energy in exciting and ionizing the atmosphere constituents. The secondary electrons produced by the primary ionizing collisions cause further excitations and ionization. The excited and ionized systems can

take part in chemical reactions, some of which release heat into the atmosphere. Direct heating by collisions also occurs, with the consequence that the kinetic temperatures of the electrons, ions, and neutral particles may differ. The primary particles may also lose energy through bremsstrahlung, giving rise to X-rays which can penetrate deeply into the atmosphere and produce ionization at altitudes much below those at which the primary particles are absorbed. The complexity of the resulting phenomena encourages the belief that auroral events may be interpreted in terms of penetrating particle streams.

(p.41) The major ions produced by the energetic electrons in the E region are N_2^+ , O^+ , and O_2^+ (red band)... N^+ may also be produced in significant amounts, attaining a rate between 10 and 20% of that of N_2^+ ... NO^+ ions (nitric oxide).

(p.100) (...radio noise from the aurora is 32 Mc/sec..)

(p.101) (...increase in noise at 500 Mc/sec. Radio noise and dawn chorus perhaps caused by precipitating electrons..) (AURAL PHENOMENA by Martin Walt, pub. Stanford University Press, Stanford, California 1965)

(p.106) Resonant frequencies and the buildup of a large amplitude occurs with structures both large and small. Ions in a sodium chloride crystal can be made to oscillate with large amplitudes when the applied frequency (infrared radiation about 61 u.m.) is equal to the natural frequency of the ions...

(p. 109) When white light is incident on a gas, or a liquid, or a solid, such as HCl, we find that at a certain frequency in the infrared 8.652×10^{15} Hz, absorption occurs...

The absorbed energy is re-radiated in all directions. Absorption also occurs at twice this frequency, three times this frequency, four times, etc., though each succeeding absorption is weaker. Similar absorption results are produced, at different frequencies, for other diatomic molecules.

Is this absorption of light similar to the energy absorption considered for the mass and spring system? With diatomic molecules we can consider the two atoms to be at the ends of a bond, rather like two masses attached to the ends of a spring. If light is some kind of oscillating electrical disturbance then it might drive the atoms into oscillation.

(p. 137) ...each little region of a luminous body, such as the sun, a candle, or a burning coal, generates its own waves of which that region is the center.

(p. 177) ...Einstein Photochemical Equivalence Law. This states that for primary photochemical reactions each quantum of energy is absorbed by a single molecule which is then changed chemically by it.

(p. 196) A bouncing ball comes to rest and the temperature of the floor (and ball) rises.

(p. 240) Alpha particles when they pick up stray electrons become helium atoms, a gas.

(p. 253) ...electric charges are additive...

(p. 308) A charged capacitor will not maintain its charge indefinitely-- the charge slowly leaks away. This is due to the ions that are always present in normal air. These ions are in the main produced by cosmic radiation. (PATTERNS IN PHYSICS by W. Bolton, pub. McGraw-Hill, London 1974)

(p. 533) C. T. R. Wilson has recently devised a striking experiment to show the presence of ions in dust free air which is not exposed to any external ionizing agency... These condensation nuclei carry an electric charge, and are apparently similar in all respects to the ions produced in gases by x-rays, or by the rays from active substances.

(p. 78) If an electron moves uniformly in a straight line with constant velocity, the magnetic field, which travels with it, remains constant, and there is no loss of energy from it by radiation. If, however, its motion is hastened or retarded, the magnetic field is altered, and there results a loss of energy from the electron in the form of electromagnetic radiation. The rate of loss of energy from an accelerated electron was first calculated by Larmor (Phil. Mag. 44, p. 593, 1897) and shown to be $2\frac{2}{3} \frac{e^2 a^2}{3c^3}$ over $3W \times$ (acceleration), where e is the charge on the electron in electromagnetic units, and V the velocity of light.

Any alteration in the velocity of a moving charge is thus always accompanied by radiation of energy from it. (RADIO-ACTIVITY by Ernest Rutherford, Cambridge At The University Press, England 1905)

(p. 71) Thus pressure, temperature, electric potential, and chemical composition are variable quantities, the values of which serve to specify the state of a body, and in general the energy of the body depends on the values of these and other variables.

(p. 73) From this we may find that the heat required to raise one gram of water from 3°C to 4°C is 42,000,000 ergs.

We have also reasons for believing that the minute particles of a hot body are in a state of rapid agitation, that is to say, that each particle is always moving very swiftly, but that the direction of motion alters so often that it makes little or no progress from one region to another.

If this be the case, a part, and it may be a very large part, of the energy of a hot body must be in the form of kinetic energy.

...the most important fact is that energy may be measured in the form of heat, and since every kind of energy may be converted into heat, this gives us one of the most convenient methods of measuring it.

(p. 144) It is a consequence of Maxwell's electrodynamics that when a body loses energy E by radiation it loses inertia of amount E/c^2 , where c is the velocity of light. In modern extensions of that theory all energy has inertia. The inertia of an electron seems to be all associated with its steady kinetic energy of motion. The closeness of the Eötvös result thus carries the conclusion that the inertia of an electron must all gravitate, and in fact that all energy possesses inertia which is also gravitative. Thus neither inertia nor gravitation could continue to be specified constants of matter: they must be connected up either with the aether in which matter subsists, or with the abstract reference-frame of space-time which is all that can remain if such a medium is denied. (MATTER AND MOTION, James Clerk Maxwell, Dover Publications, Inc., New York 1876)

(author's preface) The progress which has been made during the interval is quite comparable with that of the period 1899 to 1909, when the application of the laws of gas ions and the discovery of radioactive substances in the ground, the rocks, the sea and the atmosphere opened a new field for the investigation of atmospheric electricity.

(p. 3) This potential difference, measured with an electroscope between the earth's surface and a point 1 metre above it, amounts, on an average, to 100 to 300 volts, according to the season. Higher points at say, 2, 3, or 4 metres above the earth's surface, have potential differences of approximately two, three and four times this amount.

(p. 6) Thus J. Franck succeeded in showing that the mobility of the negative ions in these (pure, noble gases, including nitrogen) gases is about one hundred times that of the positive ions; while in air, oxygen, carbon dioxide, etc., the negative ion moves only about one and a half times as quickly as the positive ion. The abnormally high mobility of the negative ion in nitrogen, which points to abnormally small dimensions, is immediately reduced to the usual small value by the admixture of the slightest trace of another gas, e. g. oxygen.

(p. 68) ...alpha 14,000 to 21,000 Km/sec., range 3 to 8.6 cm creating 200,000 pairs of ions...

...beta 100,000 to 300,000 Km/sec.,,
...gamma 10^9 A units...

(p. 116) From these observations Hess concluded that there must exist a very penetrating radiation of extra-terrestrial origin which enters the atmosphere from above, and even at the earth's surface is responsible for part of the ionization observed in the vessel.

(p. 149) ...frequency of ultra-gamma rays 3.8 to 6.3×10^{-12} cm...

(p. 172) ...ultra-gamma radiation discovered in 1912...

(p. 196) ...atmospheric interference in wireless telegraphy and telephony, and its relation to the phenomena of atmospheric electricity and meteorology.

The "atmospherics" are usually divided into four groups:

1. Those which produce scratching noises in the telephones (grinders).
2. Those which cause sharp tapping and clicking noises.
3. Those which cause hissing sounds.

(The foregoing are purely atmospheric effects.)

4. Those which cause sudden uncontrollable variations of the strength of reception (fading effect).

(Last is interference phenomena.)

As to their cause little is known with certainty even now, in spite of the large amounts of observations.

Some only of the atmospheric are of an oscillatory nature, with vibration periods of fractions of a second up to several seconds. Many are quite aperiodic, and on this account attempts to diminish interference from this cause by very sharply-tuned receiving circuits have only been partially successful.

"Atmospherics" are strongest in the summer months, and are stronger by night than by day. They are especially strong in tropical latitudes, where in unfavourable circumstances it is often necessary to use transmitting energies for news distribution six or eight times greater than under favourable conditions of reception. The interfering noises were particularly troublesome when spark transmitters were still used.

(p. 196) Another class of atmospheric seems to arise from definite

centres, particularly from extended mountain ranges. The observation of the American polar explorer, Dr. Donald McMillan, is remarkable; in 1924, when he passed the auroral zone during a vigorous auroral display, he could notice no interference in the radio communication with America. This must not, however, be regarded as an indication that the electrical processes of the aurora borealis have no influence on electric waves. On the other hand, such interference would be more definitely felt in places far away, which received only waves which have been reflected in the region of the auroral zone; alterations in the Heaviside layer in the zenith of the receiving station are apparently of small importance for the reception. (ELECTRICAL CONDUCTIVITY OF THE ATMOSPHERE AND ITS GASES by Victor F. Hess, D. Van Nostrand Company, Eight Warren Street, N. Y. 1928)

(p. 12) The properties of ions in the atmosphere have been investigated by many workers, and it has been discovered that ions constantly disappear by combination with ions of opposite sign or are transformed into ions of different size by combination with uncharged particles. It thus becomes evident that there must be some mechanism for the production of ions. The most obvious agent would seem to be the radioactive bodies in the earth itself, but this would lead to the prediction that the conductivity of the air would decrease as we rise above the earth. Measurements, first by HESS (1911) and KOLHARSTER (1913) have, however, shown that on rising above the earth, there is, in fact, a very considerable increase of conductivity, which cannot be caused by effects of terrestrial origin. Further work established beyond any doubt the existence of highly penetrating radiation entering the earth's atmosphere from all directions in space. These cosmic rays are capable of reaching the earth's surface through the atmosphere and even of penetrating an appreciable distance into the earth, and thus are an effective source of atmospheric ions at all levels, with the ionization greater at greater altitudes. Another, less penetrating, radiation reaches the earth's atmosphere from the sun; this makes an important contribution to the ionization of the highest levels of the atmosphere where the conducting layers are situated, but is absorbed before reaching the lower layers....close to the earth, ionization due to radioactivity in the earth and in the atmosphere is important. (ATMOSPHERIC ELECTRICITY by J. Alan Chalmers, Pergamon Press, London 1957)

Nikola Tesla made some discoveries in his Colorado Springs laboratory in late 1899 and early 1900 which appear to be the surges Moray talked about. Some of the detectors and coherers Tesla used are known. They were carefully constructed nickel and silver granule coherers which were much more sensitive than normal ones were. He also used point coherers of great sensitivity.

Among his discoveries was that the earth sets up standing waves whenever lightning strikes anywhere on earth. The period of those waves was about once every $\frac{1}{2}$ hour. The earth itself is more resonant than a bell, because earthquakes cause it to vibrate every twenty minutes for a month after an earthquake. Tesla predicted the earth had three natural frequencies which have been found to be 8, 14, and 20 cycles per second.

But in addition to the standing waves of thunderstorms, Tesla made some discoveries he only hinted at in various publications. Only the circumstances of his discovery and some knowledge of the equipment he used would reveal what he found out.

(p. 359) This work consumed a number of years, but I finally vanquished all difficulties and succeeded in producing a machine which, to explain its operation in plain language, resembled a pump in action, drawing electricity from the earth and driving it back into the same at an enormous rate, thus creating ripples or disturbances which spreading through the earth as through a wire, could be detected at great distances by carefully attuned receiving circuits. In this manner I was able to transmit to a distance, not only feeble effects for purposes of signalling, but considerable amounts of energy, and late discoveries I made convinced me that I shall ultimately succeed in conveying power without wires, for industrial purposes, with high economy, and to any distance, however great.

(p. 360) I was alone in my laboratory at night; but at that time the idea of these disturbances being intelligently controlled signals did not yet present itself to me. The changes I noted were taking place periodically, and with such a clear suggestion of number and order that they were not traceable to any cause then known to me. I was familiar, of course, with such electrical disturbances as are produced by the sun, Aurora Borealis and earth currents, and I was as sure as I could be of any fact that these variations were due to none of these causes. The nature of my experiments precluded the possibility of the changes being produced by atmospheric disturbances, as has been rashly asserted by some.

...absolute certitude as to the receipt and interchange of messages would be reached as soon as we could respond with the number "four," say, in reply to the signal "one, two, three." (Tesla thought the phenomenon was signals from another planet.) (CURRENT OPINION, was CURRENT LITERATURE A Magazine of Contemporary Literature, pub. Collier's Weekly, March 1901, pp. 359, 360.)

Moray leads his reader to believe the energy is received from the atmosphere as the result of cosmic phenomena:

(p. 45) The R. E. tubes receive this energy in surges which may last only a few microseconds but the pressure and current in those surges are so large that sufficient energy is delivered to the equipment in resonance as to be unlimited and usable in multiples of flashes and magnitude which will compete with the light of day.

(p. 85) In the case of the R. E. device a different effect is established because the oscillations from the Universe, trapped by the R. E. valve, continue to enter the circuit as waves of the sea beat upon the shore.

(p. 85) Cosmic rays are constantly creating radioactive carbon and the fusion of small atoms together to make larger ones gives off more energy than so-called "splitting"... "Nuclear fission" action is... taking place naturally on this earth, in the universe, and on the planets and suns.

(p. 8) The aurora borealis is considered to be very definitely an electrical phenomenon produced by the passage of electric charges through the rarefied gases of the higher atmosphere.

(p. 10) Waves of energy have a regular beat note, coming and going as the waves of the sea, but in a very definite mathematical order, coming to the earth from every direction with a definite rhythm that might be referred to as the Father of Time, the Sire of Gravitation.

(p. 13) When the internal energy of the atom exceeds that of its normal state it is said to be excited. Kinetic energy is given up when excitation causes rapidly moving particles to give up some or all of their kinetic energy to the atom during collisions. The return of an ionized atom to a state of lower energy is associated with electromagnetic radiation.

(p. 21) There can be no "production" of current electricity, there can be no kinetic energy if there is no disturbance of equilibrium, that is to say change of potential of energy level. When one thinks of the oxygen and nitrogen molecules of the air all about us moving with the speed of bullets and striking us and everything with this speed, one can form some idea of the agitation taking place in the universe. The oscillations of the universe are part of this agitation.

...The process we are interested in is through cosmic radiation...
(THE SEA OF ENERGY IN WHICH THE EARTH FLGATS by Thomas Henry Moray)

In a letter to Robert L. Judd written by Harvey Fletcher, October 17, 1927, Mr. Fletcher wrote in part:

If I understand Mr. Morey's (sic) conception, he believes that he is drawing energy from ether waves. This method of obtaining energy from the air is quite different from the possibility suggested in this clipping. It is possible, however, that the two methods may be related. That is, some of the effects which he is getting may possibly be due to the potential difference between the earth and any point above the earth as described in this clipping. However, as I told you when I was out there, this effect seems entirely too small to explain the results which he is getting.

Moray said that oscillatory energy action, be it a Leyden jar or another capacitor, natural or man-made, acts the same. The oscillations will continue until they have reached their cycle of height and then there will be a back-rush, returning to where the oscillations originated. Every oscillation, whether large or small is completed during the same interval of time. Waves of energy have a regular beat note coming and going as the waves of the sea, but in a very definite mathematical order (numerical order is probably more accurate), coming to the earth from every direction in a definite rythm.

He said kinetic energy is given up when excitation causes rapidly moving particles to give up some or all of their kinetic energy to the atom during collisions, as is happening all the time in the universe. The return of an ionized atom to a state of lower energy is associated with electromagnetic radiation. Oscillations of the universe are like a great pendulum swinging to and fro, one continuous series of oscillations.

How The Machine Works Generally

One difficulty in reading Moray's work is trying to decide when a phenomenon applies to the working or parts of his machine and when it refers to a naturally occurring phenomenon apart from the tubes or detector of his machine.

It seems a certainty that the machine was tuned to very narrow bands of energy waves, since stepping close to it when slightly out of tune caused capacitive interference which stopped its working. In his letter addressed To Whom It May Concern, Chester Todd of Salt Lake City wrote on March 19, 1971:

I could turn the lights on and off by retreating to and from the device either with my whole body or my hand. If my memory is clear, the machine had to be tuned with a dial to be placed in this condition.

Mr. Todd also said there were forty 100-watt globes and an electric iron. A switch on top was touched with an electro-static plate to start the machine, and the lights burned cold except for a hot spot off-center on the top of each bulb, about the size of a dime.

It seems an important point in thinking about the machine is to remember the frequency on the output or secondary side was some fraction or multiple of the primary side. That would make the machine at least in resonance with itself, harmonic resonance. Nikola Tesla built his high frequency coils with the wire lengths of their parts in multiples of each other, and claimed interesting phenomena resulted therefrom.

Moray called the device a high speed electron oscillating device, a high speed oscillating energy resonator, and a high speed oscillating atomic turbine, if not other names. The operation of the device, he said, depended on the "capacity" of its modalities, i. e. condensers, etc., regardless of the potential difference. The earth and an antenna first served as his points of potential difference, and were at first necessary, because the disconnection from them stopped the machine. Different metals were later used.

James Clerk Maxwell pointed out that electricity is not energy, since it is everywhere, but only becomes so when a difference of potential exists between two points, that is, an imbalance exists. Potential has the same relationship in electricity as pressure has to fluids in hydrostatics.

(p. 49) A conductor therefor cannot be in electrical equilibrium unless every point in it has the same potential. This potential is called the Potential of the Conductor.

(p. 51) When two conductors at different potentials are connected by a thin conducting wire, the tendency of electricity to flow along the wire is measured by the difference of the potentials of the two bodies.

(p. 79) It will be shewn at Art. 246 that in general when two bodies of different kinds are in contact, an electromotive force acts from one to the other surface of contact, so that when they are in equilibrium the potential of the latter is higher than the former.

(p. 174) A charged body placed in a field of electric force cannot be in stable equilibrium.

(p. 366) It appears from this that when two different metals are in contact there is in general an electromotive force acting from the one to the other, so as to make the potential of the one exceed that of the other by a certain quantity. This is Volta's theory of Contact Electricity. (A TREATISE ON ELECTRICITY AND MAGNETISM by James Clerk Maxwell, pub. At the Clarendon Press, Oxford 1904)

It would appear, said Maxwell, that it is possible to alter not only the amount of free electricity in a body, but the amount of combined electricity.

The number of units of electricity required to saturate one gramme of ordinary matter must be very great, because a gramme of gold may be beaten out to an area of a square metre, and when in this form may have

a negative charge of at least 60,000 units of electricity. In order to saturate the gold leaf when so charged, this quantity of electric fluid must be communicated to it, so that the whole quantity required to saturate it must be greater than this. (Ibid. pp. 38-42)

Moray claimed, as did Gustave LeBon in his books *THE EVOLUTION OF MATTER* and *THE EVOLUTION OF FORCES*, that knocking something out of equilibrium is the means of obtaining energy from it. Le Bon said energy can be derived from ice if it is located in a locality colder than ice, also that energy can be obtained from a magnet by conceiving a method to knock its field out of magnetic equilibrium.

Moray's machine most likely operates on collected, and multiplied naturally occurring small imbalances, by overcoming resistances in the circuits.

(p. 4) The reason we have to "throw," figuratively speaking, this energy out of balance to utilize these energies in the Cosmos, that is out of positive or negative balance, is to obtain what might be termed an electrically neutral balance to its surroundings. One might express it, "throw the energy out of phase with its surroundings." Another way to look at the same picture is to obtain a perfect balance or as near a perfect resonance with the oscillations of the Universe as is possible, causing an unbalance or excess of either positive or negative electricity in relation to the surrounding material to be charged.... (See entire speech) (SPEECH GIVEN BY T. HENRY MCRAY, January 23, 1962, Valley State College, Northridge, California, page 4)

As mentioned before the oscillator tubes had a tremendous capacitance:

...when the oscillators are connected in the circuit, the condensers fill slowly, and the longer the current is applied to charge them, the greater the charge they take...as in filling a bucket by pouring water into it, instead of taking the charge practically instantaneously as is ordinarily the case with condensers. (Ibid. p. 9)

Moray claimed in his book it was more important in the detector and interceptor circuits to maintain oscillatory action than frequency stability.

Throughout the years of research with Radiant Energy, my attention has been drawn to some of the phenomena of radio-active substances and kindred efforts of research. All our research has been in one main field, that is, rates of vibration, which has led us to many interesting experiments and accomplishments. Not the least of these has been the breeding of lighter as well as the heavier materials by the bombardment of various isotopes with high speed particles. (Ibid. p. 5)

Moray claimed the device was tuned like a musical instrument to oscillate in harmony with the oscillations of the universe. He also said an energy converter or transformer (R. E.) would be capable of converting the high frequency, high level energy of the cosmic radiations into current of usable frequency and voltage. He called the whole process of getting natural energy the "phenomenon of the transducer combined with fission." He said he cut lines of force with lines of force to produce electric energy. He also insisted he had not invented a new source of energy, just a new way of getting it, and that his were principles of ordinary physics.

What is an oscillator? In FREQUENCY CONVERSION by J. Thomson, Wykeham Publications, London 1969, p. 167, Mr. Thomson makes the point that a laser without mirrors is an amplifier and a laser with mirrors is an oscillator.

Any oscillator is essentially a device which returns some of the output from some sort of system back to the input, such that the return energy is in phase with the input energy.

ADVANCES IN PHYSICS, Vol. 29, No. 5, September / October 1980 is a lengthy treatise on levels of ionization and accompanying resonances. It makes the point practically no experiments have been done on complete ionization wherein all the electrons have been knocked off gas atoms, but does show how various ionization levels in gases cause varying resonant frequencies.

(p. 799) The influence of resonances on excitation cross-sections is quite striking in ionic systems.

In order to determine the gain coefficient for a gas, one must choose a model for a gas atom. Any real gas atom has, of course, many energy levels which in a gas discharge are continually being excited by an enormous variety of processes. To attempt to consider all the levels or all the excitation processes would result in hopeless complication. (GAS LASER TECHNOLOGY by Douglas C. Sinclair, Holt, Rinehart And Winston, Inc., N. Y. 1969, p. 15)

Conclusion

In a few words, electric energy is derived from natural imbalances by first finding those imbalances or creating them, and then attaching the right kind of machine to them. In the case under discussion, losses from friction, heat, and resistance have to be cut to negligible limits to detect, collect, and store seemingly feeble currents and effects.

Frequency splitting, step-down transformers, push-pull oscillators circuits and other such engineering questions follow the target imbalance. The design path meeting with the fewest inconsistencies in work already done would seem to be the right one.

Other Atmospheric And Assorted Devices

Nikola Tesla said a device to obtain the feeble currents of electricity from the air had to have a large surface and many points to permit the electricity flowing from the ground to disperse itself into the air which is normally an insulator, although a leaky one.

1889 U. S. patent number 414,943, A Method Of Utilizing Natural Electric Energy, suggests standing an insulated pole high in the air with a many-pointed crown on the top. The grounded end also has many points. Several such poles can be linked together to increase the surface area and current strength.

The first radio signals ever sent through the air were powered by atmospheric electricity obtained from a copper-wire laced kite flown by Mahlon Loomis in 1859. The kite was tethered with copper wire and the broadcast was sent 40 miles - ^{US} patent number 129,971. (FATE MAGAZINE, March 1976, p. 67)

Nathan Stubblefield sent messages through the ground. He also buried and earth battery near his home in Kentucky in the 1880's, and derived enough electric current to power a small electric motor for two months and six days, until he got tired of hearing it buzz and turned it off. He also detected a multiplicity of free energy sources--in the earth, air, and water--just for the taking. (FATE MAGAZINE, June 1957, p. 79+) # 887,357

SCIENTIFIC AMERICAN, April 20, 1901, p. 242, records an Italian inventor who used a carbon granule coherer to detect far-off electrical disturbances and storms, much the same as Nikola Tesla did in his Colorado Springs experiments.

Alfred M. Hubbard, in the 1900's, made a transformer which received electric impulses from a remote sending station. His picture appeared in the SEATTLE POST EXAMINER, Feb. 26, 1928 or/and the Seattle POST INTELLIGENCER, December 17, 1919. (FATE MAGAZINE, July 1956, p. 36) Arthur Aho, printer of Baldene Books, P. O. Box 55, Liano, California 93544, has more details.

U. S. patent number ^{329,724} is an Electric Earth-Battery designed in 1885 to give a theoretical unlimited amount of energy to its user. Patent numbers 597,009 and 283,077 present means for greatly extending the earth-battery's plate life.

One Lester Hendershot device, which first received public attention in the February 26, 1928 issue of the NEW YORK TIMES and other newspapers of the time, was an exceptionally powerful machine, having an output of 60 h.p. for 50 pounds of equipment. Art Aho (above) worked with Lester Hendershot.

The CASSET NEWS of Salt Lake City, January 3, 1981, mentions a Larry Jamison of Memphis, Tennessee, who has built an "energizer" suitable for driving cars and not requiring external energy input for long periods of time.

Nikola Tesla designed a crude radiant energy device, described in patents 685,957 and 685,958, using a polished metal plate connected to ground and utilizing the sun's rays or roentgen rays.

SCIENCE AND MECHANICS, Spring 1980, p. 45+, carries the story of a permanent magnet motor invented by Howard Johnson and granted U. S. patent number 4,151,431. It generates, as presently envisioned, about ten horsepower.

Reinhold Rddenberg also designed a Charged Particle A. C. Generator, U. S. patent number 2,708,339, which although of large dimensions, is supposed to derive energy from charged particles coursing through its chambers.

This author has conceived a marked number of improvements to the general concept for obtaining atmospheric electricity shown in patent number 414,943 above.

A Previous Paper On The Moray Device
about 1978

THINGS KNOWN ABOUT MORAY DEVICES

1. It had an antenna. Energy production was proportional to the area of the antenna, but not critical within certain bounds. The last machine had no antenna or ground wire. ^{Not certain.}
2. The device had a ground which was soldered to a lead-in wire. The ground had to be good, a cold water pipe for instance.
3. The detector had a delicately balanced part inside.
4. The machine was changed in some respects with time and development which led to slightly different descriptions by different people.
5. The method of activating the machine was always the same. Rubber and iron plates late ^{Wickström plates}
6. When fixtures or loads were quickly changed, enough power resided in the machine to cause it to begin working by itself without stroking again with a magnet.
7. The antenna was raised above the ground several feet. It worked best that way.
8. The antenna ran parallel to the ground and was usually 80 to 100 feet long. It was made of heavy copper wire. At the laboratory it was 200 feet long.
9. When the load maximum of the machine was reached, the lights dimmed but the machine continued to work.
10. The light bulbs lighted by the machine had a hot spot about the size of a dime opposite the filament.
11. Wire size used by the machine was #50 in the internal circuitry. The machine operated.
12. The transformer was an air core transformer. ^(Not certain.)
13. To start the machine a coil of wire wrapped around two soft iron poles was stroked. At the appropriate time, a switch on top was closed and the lights or other load(s) on the machine were turned on. A u-shaped magnet was used to do the stroking.
14. The ground was a steel rod pounded into the ground.
15. Window glass plate is a conductor of the energy the machine draws when part of antenna
16. Bumping the machine caused the delicately balanced part in the detector to fall out of place and break the circuit of the earlier machines.
17. The detector could be opened up and reassembled in open air and still operate.
18. Moray seemed to see great significance in the behavior of alpha, beta, and gamma rays in the field of a magnet.
19. One machine was described as containing: an antenna and lead-in wire connected to the terminals of a switch. Two wooden boxes, one containing a high frequency transformer, were placed on a table. The other box contained two sets of condensers-- 10 large in one set, and 10 small in the other; two composition cylinders about 1 1/2" in diameter by 4" long, weighing 3 or 4 ounces; a (detector) box approximately hemispherical in shape and 2" in diameter and weighing about 2 ounces; and a coil wire.
20. In 1929 detectors were the names given to crystals for receiving radio signals. The word valve was applied to radio tubes, but could have been applied to detectors as well.
21. Moray seemed to have experimented with various crystals, catalysts, and their reaction to light and heat energy.
22. "Radiant energy" was the name given to energy cast out from a single source in whatever form (by Becquerel and others) It was commonly applied to all forms of electro-magnetic energy--light, radio waves, and such.
23. The detector was not a vacuum tube nor a tube in the sense we understand them.
24. The detector amplified the cosmic frequency, as it did radio signals.
25. The radio detector Moray made, and which picked up Admiral Bird's broadcast from Antarctica, was a solid state device. There were two detectors talked about.
26. Much of the material in the Sea Of Energy In Which The Earth Floats is practically a copy of the works of Becquerel and others, such as Le Bon & Rutherford.
27. Moray states that the early pioneers of radioactive materials may not have realized they were showing the way, and commented that much could be learned by taking up the experiments of Rutherford and others.
28. Moray states alpha particle emissions are the most significant thing about radioactivity, since they render air inside a closed container a conductor of electricity.
29. Moray claimed the astonishing demonstration of getting energy was a matter of crui

- physics. The energy is all about us, he said.
30. The Moray valve was described as an approximately hemispherical, two-inches-in-diameter box, fully enclosed, including a screw-on lid, such that it can be disassembled.
 31. Germanium is used in the detector, as are other elements.
 32. The oscillator tubes are "composition" material.
 33. Sometimes Moray stood on a hard rubber mat while he filled his machine with energy by stroking it. Hard rubber, unlike glass, is a hydrocarbon-based substance.
 34. Sulfides of different metals are used in the Moray valve. These materials are also used in old crystal detectors for intercepting radio signals and rectifying them. (molybdenite and iron pyrite)
 35. The molybdenum and germanium metal mixture used in the Moray valve is for one use an "alloy," and for another use molybdenum, sulfides, and other materials are added as "impurities" to germanium.
 36. Moray talked about the need to knock things out of equilibrium to obtain energy.
 37. He also said happenings in the laboratory were like the whole universe, a gradual breaking down of matter into energy.
 38. Moray spoke of buckets catching the surges of energy from outer space--his capacitor
 39. Moray called his oscillator tubes "cold cathode" tubes, that is, they operated without heat to emit electrons.
 40. The machine most seen was housed in a wooden, light-colored box. A switch on the top, and two soft iron poles wrapped with wire, as well as the antenna and ground wires, and the wires to the load were all that showed unless someone actually looked inside. There are pictures of Moray demonstrating his one-box machine.
 41. Moray said his valve would operate a radio in some hookups with no batteries whatever. The same can be said of most crystal radio sets.
 42. The Moray valve would also work with two penlight batteries in some hookups.
 43. Oscillation means reversing current.
 45. Moray is said to have stated, frequency, not current is important.
 46. By proper design, a smaller force can control a larger force.
 47. Reversing fields do not have to create heat.
 48. When antenna or ground lead-in wires were disconnected while the machine was operating a spark up to 6 inches long would leap from the wire at the disconnection.
 49. The light bulbs were connected to each other in series. Disconnecting one or screwing it out, as Moray quickly plugged in a flat iron, broke the entire circuit. Parallel, it
 50. When the flat iron was quickly changed, it broke the circuit, but when the circuit was restored, without "re-tuning" the lights would remain off, then presently come on again by themselves.
 51. The flat iron took "about five minutes" to heat up, 2½ minutes on later machine.
 52. Moray talked about electricity having mass. He also compared the energy to a great pendulum swinging across the universe.
 53. Moray spoke of damped and undamped oscillations.
 54. Induction furnaces use diodes and capacitors to create their high frequencies. 600 v., 60 kw, and 2200 cycles will melt metal about 1½" in diameter at the smallest. It will also melt the shoestring hooks in shoes close to the water cooled lines conducting the electricity. 600 v., 75 kw. and 400,000 cycles will melt metal powder. The diodes permit a field to build up.
 55. Moray repeated that when a negative charged wire is raised in the air about it, the charge quickly dissipates, but the same charged positively does not dissipate rapidly
 56. Moray claimed his latest machine produced 50 kw from 60 pounds of 29 amp tubes and other materials. He started it with a charge from a rubber and iron disk rubbed together.
 57. Moray claimed the source he used and originally thought to be static was discovered to be oscillatory in nature.
 58. A metal sphere raised in the air forms a positive charge on the lower half and a negative charge on the top.

59. There are two lead-in wires, two oscillator tubes, two sets of condensers, two poles protruding from the box. Such an arrangement suggests two polarities and possibly two steps in the procuring of energy.
60. The capacitors in his 1925-1928 machine were normal, off-the-shelf capacitors. One set was large; one set was small. Wire and condensers were common.
61. "The conical detector and cylinders called oscillator tubes were the only components not commonly understood."
62. His last machine produced 50 kw and would emit a spark of 18". A six inch discharge was emitted at the point of ground and antenna connection for a short time before the lights would go out because the circuit was broken.
63. Light produced by the bulbs was white and seemed to have less ultraviolet and red rays.
64. Touching the finger across the contacts of the switch on top of the machine would give a vigorous shock when the machine was being tuned to start it by stroking.
65. Removing the ground or antenna connection caused the lights to go out, but they would come on again when the circuit was restored, provided not too much time was lost.
66. Moray believed his real invention was in the tubes of his machine. (p.146, 147)
67. The tubes of his latest machine would operate a radio to produce staticless music.
68. Many features of the machine appeared incidental, but were of basic importance. (p.147)
69. The circuits of the detector were fundamental electric circuits not noticed until pointed out. (p.151)
70. A radio transforms electric waves into mechanical energy; Moray's device transforms them into heat, lights, etc.
71. Moray's radio was run by what he called his Moray germanium fission valve.
72. Radioactive substances were employed in his machine, if not originally, later.
73. Moray was seventeen years old when he first showed his device to his friends.
74. Hard rubber and iron disks were the excitation source on his last machine. (p.171)
74. He talked of tapping the energy as being a matter of ordinary physics.
75. "Tuning" the detector was part of his demonstration.
76. All his detectors for the cosmic machine would receive radio signals.
77. Moray said he began experimenting with static electricity as did Benjamin Franklin with lightning. He was trying to take electricity out of the ground. He discovered it did not come from the ground but from the space outside to the earth, and that it was not static, but oscillatory in nature.
76. Moray's last machine seemed to work properly with a load on its work circuit as little as $\frac{1}{4}$ watt.
77. The early oscillator tubes could leak.
78. A light bulb connected to the antenna while the machine was operating several others in the regular position would light up, but would cause the others to dim.
79. Small effects could be multiplied by making a device larger.
80. The energy could not necessarily be measured by conventional means, but could be heard with a telephone receiver. *as clicks initially.*

RECAP OF MORAY'S REASONING

1. He believed all things are vibrations, frequencies of unlimited variation; yet all vibrations are harmonies of lower or higher frequency. Sound, heat, cold, light, or electricity (electromagnetic) are only vibrations manifesting themselves upon a medium. They are manifest by a medium of reception. Because a dog can hear some vibrations humans cannot does not make them less real.
2. Generators do not create electricity, but pump it. When it is used, the potential is simply lowered. Generating is done by breaking lines of force with lines of force.
3. Nature has its means of electrical generation and man can copy and improve on it.
4. By oscillations, kept alive by oscillations of the universe, one can generate electrical energy without a mechanical prime mover. There can be no utilization of current electricity without an interruption of equilibrium--no kinetic energy is delivered without a disturbance of equilibrium, or change of potential or electrical level.
5. When one thinks of molecules of air around us moving with the speed of bullets, striking everything with force of excitation, one can form some idea of the agitation taking place by oscillations of the universe.
6. Radiant energy exists in and around the earth and may have its sources in the natural processes and movements of the earth, its atmosphere and elements in celestial bodies. It radiates from the earth to other planets, too. It is the same source tapped by any electric generator. A generator uses a mechanical prime mover to oppose magnetic lines of electric force. The Moray method employs an electrical oscillatory method to oppose oscillatory lines of force. It is electromagnetic and no new source has been discovered, only a different method of getting it. It is the pure unaltered form of energy not changed by AC or DC generators.
7. Wave length and frequency must be differentiated.
8. It is the phenomenon of the transducer combined with fission. Radiant energy means using energy released by fissionable reactions taking place in the stars.
9. The total energy of cosmic radiation is more than the entire luminous output of all the stars and nebulae of the universe combined. Unlimited power is delivered to every one's doorstep.
10. The Moray radiant energy device is a high speed electron oscillating device.
11. Attractions and repulsions take place between electrified bodies, magnets, and circuits conveying electric currents. Large masses may be set in motion in this manner to acquire kinetic energy through induced currents, although no visible connection took place. What disappears in one form, reappears in another. It existed in the intervening space it passed through in the meantime.
12. The process of electrifying a conductor is therefore storing energy in some way in or around the conductor in some medium. The work is spent altering the state of medium. When discharged, the medium returns to its original state.
13. Maxwell founded his theory of electricity and magnetism and their distribution on a surrounding medium.
14. Polarization means work has been done on a conductor and its medium to alter its state.
15. Consider the case of a body charged alternately, positively and negatively in rapid succession. The positive charge means a positive polarization of the medium, which begins at the conductor and travels out through space. When the body is discharged, the medium is once more set free and resumes its former conditions. The result of alternate charges of opposite sign is that the medium at any point becomes polarized alternately in opposite directions, while waves of opposite polarization are propagated through space, each carrying energy derived from the source or agent supplying the electrification. Here we have a periodic disturbance of some kind occurring at each point accompanied by waves of energy traveling outwards from the conductor. We know alternating electric charges are accompanied by corresponding changes of state or vibrations of the medium, and if the charge be varied periodically and with sufficient rapidity, we have a vibration at each point analogous to, and perhaps identical to what occurs in the propagation of light--a combination of wave and particle properties. The need for sufficient rapidity of alternation was confirmed by Professor Hertz.
16. When a resilient substance is subjected to strain and set free it may recover its former state or recoil elastically past its position of equilibrium to oscillate. The

- same thing can happen to a discharged capacitor. It can overrun itself and recoil until the energy is dissipated. Electrical inertia is set up by synchronizing discharging capacitor oscillations of the device with those of the universe by means of proper impedance, reactance, and inductance in the circuit. The capacitors charge and discharge slowly until the energy stored in them is radiated in kinetic energy through the device which is kept operating indefinitely by resonant oscillations of the universe. The greater the inductance, the longer the current continues to flow once it is established by a synchronized cosmic surge. Mathematically, the equation is the same for electrical and mechanical phenomena. The rapidity of oscillations is governed by quantity of capacity and inductance.
17. Air conducts electricity away from charged objects. Why doesn't the earth lose its charge? The earth has a negative charge. Why isn't it conducted away into the atmosphere? The earth is a generator.
 18. Ionization increases the higher one is from the earth.
 19. Every oscillation, great or small, is completed during the same interval of time. Wave of energy have a regular beat note.
 20. Energy is elastic and resilient, subject to displacement and strain. Released, it will surge back and forth as the waves of the sea until the original work done on it is used up. If internal impedance is too great, its oscillation will be limited. Cutting down resistance to a minimum, and with synchronous, resilient, ionic action of the energy device with ionic actions of those coming from without, recovery will be quicker and quicker until inertia asserts itself prolonging times of recovery, carrying the recoil of energy beyond natural oscillation, thus prolonging the synthetic oscillation by natural oscillations. Harmonics set in and the oscillations will continue as surging with a definite beat note. Energy is emitted from the stars in various wave lengths or frequencies.
 21. We see actions of the universe reflected in the constituents of the smallest atom--the same laws govern the stars that we see in our laboratories. Matter seems to consist of energy charges which probably effect the motion of heavenly bodies. Elements maintain equilibrium by attractions and repulsion--oscillations.
 22. Radiant energy means proceeding from a center in straight lines in every direction.
 23. Atoms possess and absorb kinetic energy. Excited or ionized rapidly positive or negative atoms break lines of force as does an electromagnetic generator. Kinetic energy is given up when excitation causes rapidly moving particles to give up some or all of their energy during collisions. Ionization can be on various levels. Electromagnetic, cosmic radiation is our interest. The greater the frequency, the higher the ionization or excitation.
 24. Discover a dielectric (insulation or valve) for the universe's energy and a means to make a device oscillate with the energy of the universe, and one has harnessed the energy of the universe. A battery of vibrating units produces 50 kw for 60 pounds of instruments. The oscillations may be said to be opposite the harmonies of the universe cutting lines of force of oscillations by oscillations. It all adds up to the fundamentals of electromagnetism. There are tremendous energies coming to earth from outer space--the universe is alive with cosmic particles. The frequency of the Moray device is lower on the secondary side than on the primary, establishing almost complete resonance.
 25. Vibrations exist as harmonics, like those of "C's" on a piano. All matter possesses a natural rate of vibration. Cosmic rays are octaves above gamma rays.
 26. Air conducts electricity at night just as in the day; therefore, the sun can not emit this energy.
 27. The relation of energy to matter becomes the potential of the universe, one continuous series of oscillations, swinging to and fro like a great pendulum across the universe.
 28. A steady source of energy can be obtained just like a steady flow of water can be obtained from the waves of the sea. It can be tapped as easily now as it will be in the future. Energy used in our lights does not cease to be; it has only a lowered potential.
 29. Electrons, neutrons, protons, photons, ions, etc. are the energy of the universe, dissociated here and there, and by the forces they generate become matter to our senses. These produce changing stages or kinetic energy. They are produced by nature's cyclo-

- trons, and are deflected by the earth's poles to an extent.
30. The Moray device works equally well in deep mines, under water, or on mountains or in an airplane.
 31. Two molecules not in contact given opposite charges have something akin to chemical affinity and cohesion. Opposite charges between two neighboring metallic surfaces cannot be maintained electrostatically, but may be momentarily imparted by a sudden jerk or disruptive discharge or receive electric impulses which effect chemical cohesion. Electrons in a polarized atom need not be disturbed greatly to produce chemical cohesion. Polarization converts ordinary molecular forces in cohesion into incipient but real chemical affinity equal to the inverse square.
 32. The principles of ionization are important (work copied from someone else).
 33. Beta particles, particles from radioactive substances, fast moving positive charges (protons, alpha particles), fast ions, ultraviolet light, x-rays, cosmic rays, chemical reactions, heat, bombardment by fast electrons, incandescent metals, incandescent surfaces (salts, phosphates, oxides, chlorides, complex metal salts: sodium ions, potassium ions, barium ions), atomized liquids, friction between solid particles, collisions of free electrons, or electric fields ionize gases.
 34. No new laws are claimed, just electrical generation ability without the use of a primover.
 35. The detector tubes have a synchronized pull with specially developed oscillators of high faradic capacity and provide a means through which oscillating energy may pass to valve oscillators whose relation to the first stage valve is such as to permit oscillations to come in from but not to return to the outer circuit, incorporating an automatic variable relation to the oscillations from the universe, and capable of setting up within their circuits initial oscillations which coincide with oscillations of the universe.
 36. In the detector and interceptor circuits, it becomes more important to maintain oscillatory action than frequency stability. The relationship of natural and forced vibration is particularly important. A point of resonance will be reached at some frequency and the charge will reach a magnitude depending on the immense impressed force of the universe--pure resonance.
 37. R. & L. tubes were prevented from becoming blocked in their dissipation of charges created by oscillations that accumulated based on the oscillatory-capacity back rush effect herein applied to vacuum tubes. These tubes enlarge and prolong the time of charge and discharge of the capacitors in the circuit to an appreciable interval in perfect harmony with the natural energy wave through the interceptor's valves and oscillators in the circuit, which set up in the circuit electrical pulsations corresponding to the energy waves captured by the interceptor and again kept from returning to the second outer circuit by "multi-walled" valves. The final tubes act as energy pressure transmitters with a means to prevent shunting condensation by a special "getter." This stops condensation accumulating at the base of the tubes which would block their ionic action.
 38. The energy discharge band is "split" into lines of variation. The oscillations are not simple oscillations but set up an action like that of inertia, which continues once inertia sets in. The oscillations vibrate during the same period of time regardless of the potential, but the rate of vibration of the device depends on the "capacity" of its parts (condensers, etc.).
 39. When some substances are bombarded with alpha particles they give off electrons. This principle is applied in vacuum tubes. Thomson gave a similar action the name Delta Rays. Is it possible some "particle" from the cosmos, even more penetrating than alpha particles, would penetrate quartz or various substances and set up a decided ionic action? One could possibly learn much from a glorified "monochromator." Sodium, potassium, caesium, rubidium, barium, strontium, react to visible light, or certain wavelengths. Might not certain other substances react to oscillations from the cosmos or artificially produced radiations?
 40. The universe is analogous to a radio transmitting station transmitting energy of various wavelengths. Cosmic and radiant energy are synonymous.
 41. Energy must be absorbed to be used, converted to heat, chemical energy, mechanical energy, electrical energy, and forms now unknown.

42. An ion consists of a negative electron and positive ion. These attract each other. The charge is lost at a rate proportional to the number of ions plus velocity of attraction.
43. In some tubes electrons are emitted not from a filament indirectly from a cathode which does not enter into the direct electrical function of the tube. Does this teach us anything toward an indirect generation of ions and ionic action? Could the opposite deflection of alpha and beta rays and the undeflected course of gamma rays teach us anything about cosmic energy valves and oscillators? The more perfect the ionic action the greater the velocity, and the greater the mean free path and ionic energy between collisions, the the greater the kinetic energy will be conserved. Collisions will be "perfectly resilient."
44. Resonance has been obtained here where a return wire in an electrical circuit is not necessary. Marching feet, running dogs and some harmonics come within the danger zone for bridges, as also breaking water glasses. Every substance has a natural mechanical resonance and point of dissociation. This also applies to electrical energy. The radiant energy tubes receive surges which last only a few micro-seconds but the pressure and current are so large sufficient energy is delivered to the equipment as to be unlimited and usable in multiples of flashes comparable to the light of day. Energy emitted must return to its source.
45. Resonance and pressure amplify energy.
46. R. A. tubes possess greater ability to obtain saturation and thus charge accompanying capacitors or condensers at a more steady rate, which when a certain voltage is reached ionization occurs in the gases of the discharge tube and causes the condensers of the valve circuit to discharge into other condensers of the oscillators and components of the circuit. (latest machine)
47. When ionization in the preceding tubes is no longer possible because of reduced voltage, the process starts all over again. The first valve passes vibration energy into an oscillatory circuit, ionization sets in, a discharge occurs and energy passes through another valve into the oscillators. The process is repeated from the first stage on to the second, to the third, and so on like a bucket brigade. A steady flow of water can be obtained from waves of the sea.
48. When a vibration of any kind strikes a boundary between two media of different kinds at an angle of less than 90 degrees, a transformation of vibratory rate takes place. Many phenomena of certain frequencies are unexplained. *New it triboluminescent zinc?*
49. Many magnetic wave lengths and frequencies are emitted from stars which can be tuned to; all x-rays, gamma rays, or cosmic rays are complex and not of the same frequency.
50. Electrons in motion constitute an electric current.
51. Gravity is wattless energy until some force is exerted to oppose its potential. Gravity can be controlled.
52. Dr. LeBon noted matter is capable of dissociation. He had reference to radioactive materials which make air a conductor of electricity, passing through obstacles and being thrown off course by a magnetic field, seen in all substances to some extent. J. J. Thomson showed its verity in substances--clay, sand, and such.
53. Cosmic energy is the source of intra atomic energy. Matter is a colossal reservoir of energy. Matter is stable; heat, light are not stable. Weight, permanence, and form result from matter in equilibrium. Rapid transformations of equilibrium we call heat, electricity, light.
54. When matter is disturbed, considerable energies manifest themselves. Excitants act like detonators freeing energies greatly in excess of the slight cause which liberated them.
55. Ultraviolet light causes electric charges to dissipate, finally appeared the cathode ray.
56. Gases of oscillations of the universe have gone unappreciated.
57. Loss of electric charges on metal through light has been underestimated in importance.
58. Pre-conceived ideas of atomic theory and radioactivity barred the tapping of energy from the cosmos.
59. Atoms of the universe are the capacitors of energy.
60. Cornu pointed out concentrating a charge of one coulomb on one sphere against an unlike charged sphere would create a repulsion of 9 billion kilograms.
61. Any action capable of modifying the nature of a body is a generator of electricity.

62. Electricity is a manifestation of the vibration of matter.
63. Rutherford and Curie discovered facts concerning radioactive substances, radiations called alpha, beta, and gamma rays. Alpha radiations are positive ions; beta radiations are identical to cathode rays, and gamma radiations are similar to x-rays. Did these pioneers build better than they realized in showing the way?
64. Alpha particle deviation in a magnetic field is 1000 times greater than that of beta particles. They account for 99 percent of radioactivity of radium. They render air a conductor of electricity. When a radioactive body is enclosed in a glass tube, all the alpha particles are stopped by the glass walls but inside those walls great things take place because of their electrical conducting ability. Radium retains temperature 3 to 4 degrees above ambient.
65. The emission of alpha particles, positive ions, is together with production of emanation (gas-radon) the fundamental phenomenon of radioactivity. When striking phosphorescent bodies the alpha particles render them luminous. (pp. 76-81) It could prove profitable if these experiments of Rutherford and his co-workers were taken up again.
66. The velocities of ejection of radioactive particles seem incomprehensible when compared to small planetary systems animated with enormous velocities. The invisible speed of rotation of elements would be transformed into speed of projection perceptible only by proper instruments.
67. All these rays upon touching gas cause secondary rays, but less intense. These secondary rays are also subject to a magnetic field.
68. Although catalytic actions were known many years ago, it was only in later years that they proved to play a preponderant part in the chemistry of living beings. (p. 82) In some reactions, it appears energy is transported from the catalyzing body to that catalyzed.
69. Combining materials such as pure substances--various sulphides, phosphates of lime, which do not phosphoresce normally, with bismuth, manganese, and raising their temperature provokes dissociation of matter as they begin to phosphoresce.
70. Fusion and fission take place naturally all the time.
71. A cosmic energy device is a high speed oscillating energy resonator.
72. All space is saturated with energies which are vibrating in their ultimate analysis and very closely allied to electrical action.
73. High frequency currents are either damped or undamped.
74. Capacitors in the R. E. circuit discharge stored energy. With negligible resistance in the device, no energy is lost in heat and the oscillations continue. Oscillations trapped by the R. E. device continue to enter the circuit as waves of the sea beating on the shore. The current starts from zero, rises to a maximum, then falls to zero and becomes reversed after which it passes through a series of oscillations. The discharge there does not take place in a single flow from one capacitor to another, but a back rush sets in, and a series of currents or oscillations occur alternately in opposite directions.
75. We have discovered the oscillation of the universe corresponds to oscillation of electric capacitors depending on the frequency of the energy involved, going on into infinity.
76. The Moray device is tuned to oscillate in harmony with the oscillations of the universe just as musical instruments oscillate together, all completed in the same cycle of time.
77. Maxwell stated the entire wave motion of the universe is electro-magnetic. Thomson proved the theory a fact. *The next stage is tuned to with the spill over freq. is simple.*
78. Peak pulses of Moray device spill over into next stage through a special detector or valve which prevents the return or feed-back of energy from surrounding circuits once it has been "tuned." Oscillations are supported by harmonic couplings. (p. 107)
79. The machine operates as long as it remains properly tuned and the external circuit completed through a suitable load.
80. The special tubes which appear to be the key to the device are ionic, cold-cathode tubes which require no external power sources.
81. Concerning detector, see pages 126-139, and see paper on the subject (I have written).
82. The tubes and transformer did not seem to obey known laws. (pp. 146-147)
83. In his laboratory Moray turned lead into gold, polonium, and radium F. (p. 9 R2)
84. A little work has been done with frequencies 10^6 to 10^7 A.T.

85. When oscillators are connected in the circuit, the condensers fill slowly, and the longer the current is applied to charge them, the greater the charge they take up to their maximum, much as in filling a bucket by pouring water into it, instead of filling it instantaneously. (p. 8 RĀ)
86. Oscillations are picked up by neutron bombardment. (p. 8 RĀ)
87. These electric oscillations are not simple oscillations, but surgings with a definite beat note.
88. In addition to possessing kinetic energy, an atom can absorb energy or negative particles, as in breaking lines of force in the modern electromagnetic generator. Kinetic energy is given off when the collision results. The greater the frequency, the greater the ionization. Matter is susceptible to motion.
89. Energy of sonic oscillations of the universe coming eventually to the earth is called radio activity.
90. As in the reception of radio waves and radio active waves, so in this the circuit is tuned (as of 1942), and by arrangement of our own type of special oscillators, frequencies are reduced so that they may be made to respond to the right arrangements of inductances and capacities and of a special "valve" of our own construction, to prevent the return of the power to the outer circuit and force it to go through the power application circuit. (p. 17 RĀ)
91. Ionization is determined by gas pressure.
92. The energy coming in is elastic and is subject to displacements and strains. When the strain is removed, the energy will surge back and forth as the waves of the sea and will continue to oscillate as long as the internal impedance is kept within certain limitations, and by synchronous actions of the device with the actions of the universe recovery will be quicker and quicker until inertia asserts itself. The condensers are filled slowly like buckets until the maximum charge is reached, instead of instantaneously like most capacitors. (p. 17 RĀ)
93. Energy of the universe is made up of electrons, neutrons, and ions.
94. Moray increased radioactivity of carnotite, uranium, and other radioactive substances including a combination of copper and lead.
95. Moray believes the surges of energy come like waves of the sea, a powerful first surge, which is followed by a less powerful and graduated surges which fade to nothing only to begin again immediately. It was reported by someone the surges follow the pattern "7."
96. Moray became aware of the surges by listening to telephone lines at night.
97. Nikola Tesla did not make known all his Colorado experiments.
98. In 1956 Moray claimed one of his units could be built for \$800. Mass production could reduce it in half.
99. Moray began by trying to take electricity from the ground in the summer of 1909. By the fall of 1914 he had sufficient power to operate small electrical devices. He had the idea of static experiments based upon those of Benjamin Franklin, but he discovered the energy he sought was not static. He discovered in 1911 the energy was not coming out of the earth, but to the earth. By this time, he could light a 16 candle arc light to about half capacity. He was born Aug. 28, 1892. No more real progress was made until 1925. At first only enough energy to make a slight click in a telephone receiver was obtained.
100. In 1925, the largest instrument was about 8 inches in diameter, six inches high, and circular in shape. It would heat a standard type C 100 watt G.E. lamp.
101. Once operating, the machine will charge itself.
102. The last machine was driven over five hundred miles while it operated in the back seat of a car, producing 50 kw of power. Plugging in or unplugging loads connected to it did not affect its output.
103. Moray spoke of his latest machine having a field around it which acted like rubber bands stretched away from the machine and flexed by outside particles.
104. One article described Moray's machine (about 1956) as having two large inductances or coils about six inches by eight inches on top. Also on the machine was a bar of copper and a bar of silver, both unexplained. (page lost)

THINGS PROBABLY TRUE ABOUT MORAY'S DEVICE

1. Maxwell's laws of electro-magnetic energy apply to the radiant energy device.
2. The detector was a solid state component.
3. The detector was a semi-conductor of sorts, using sulfides of metals, germanium, and radioactive materials.
4. The source of power Moray tapped is of an oscillatory nature.
5. The Moray valve was the cosmic detector in his machines since it was new in that it had no heat source to emit electrons, and by his own actions he protected it from observers, while observers could look at and handle the rest of the components in the machine.
6. The machine was started by filling some sort of condensers or capacitors, then shocking something with a sudden release of the energy to start the machine, accomplished by closing a switch at the right time in the circuit of the machine.
7. If the detector had radioactive material inside it (radium, thorium, and uranium) it had a strong positive charge inside the envelope of metal.
8. If the detector contained radioactive material, the other components in the detector were rendered unstable by reason of induced radioactivity which caused them to behave in a different manner than before--probably making them more sensitive to certain high cosmic frequencies when used together.
9. The detector probably intercepted a band of high cosmic frequencies.
10. Moray's refusal to let someone see the detector, that is, feel it was motivated by fear it could be knocked out of adjustment by handling.
11. The detector was not a diode, but allowed energy to pass in either direction. Not Certain
12. The stone numbered 139 in the Moray valve is probably not a semi-conductor, but an amorphous mixture of materials pressed together.
13. Electrical energy that drives alpha particles about has a positive charge.
14. The frequency which drives beta, alpha particles, and gamma rays out of the nucleus of an atom and through space probably has a positive charge mostly, and is probably the energy and frequency Moray was interested in.
15. The oscillator tubes are probably hydrocarbon based "composition," since regular glass was a conductor of the frequency of energy Moray tapped.
16. Moray probably stood on the hard mat during his demonstrations to avoid electrical shock.
17. The envelope of the Moray valve was probably thin enough that beta particles could escape through the metal.
18. If elements absorb energy they emit, it seems reasonable that the heavier radioactive elements would be used as detectors.
19. Moray probably compared the breaking down of radioactive matter to the particles and energies coming to the earth from outer space.
20. The buckets were probably crystalline substances which store and allow the energy to be released slowly, capacitors which seemed to be the only things in the machine capable of acting as buckets or a retaining wall to restrain the sea of energy coming to the earth. It isn't likely the oscillator tubes contained the large amounts of energy. They probably had some other function--to keep the oscillations from dampening or they were switches to permit passage of the peaks of the surges.
21. In his latest machine, there were stages the energy went through to be usable to the maximum. The two sets of condensers in the first machines could have denoted two-stage action of some kind to produce the current.
22. Perhaps because the earlier machine needed a good signal to operate, it used a good ground.
23. The resistances in the light bulb filaments, flat irons, motors, or such were part of the oscillator circuit. In fact, without a slight resistance, the machine wouldn't work.
24. The cold cathode tubes allowed a field to build up before switching took place.
25. Of the two sets of condensers, the smallest set probably kept the machine going between surges, while the large fed the load circuit.

26. The tiny wires used inside the circuit of the machine probably took advantage of the skin effect in high frequency electricity.
27. The machine probably had a switching action which as quickly as a field became positive, reversed it to permit or cause a negative charge to remove the positive, so another positive charge could form.
28. Moray's confusing explanations about physics probably refer to the principles that his detector and oscillation tubes operate on.
29. Since Moray was between 15 and 17 years old when he had his first machine operating successfully, although not necessarily efficiently, he probably did not use radioactive materials in it, but more likely materials common to crystal radios or something similar in his day.
30. The principle of Moray's machine's working was ~~more than likely~~ ^{possibly} the principle of attracting positive charged particles to a negative charged wire and causing them to yield up their energies by deceleration. An exchange was set up by oscillating or switching the field in the wire preventing positive charges from choking the wire and neutralizing the field once and for all. The action on the wire would be similar to waves coming in and leaving a shoreline. Alpha particles are attracted by a negative wire and repelled by a positive field. The air above is mostly positive and remains so constantly day and night. It is ionized gas, and seeks to neutralize itself or find a state of equilibrium. Particles coming to the earth constantly add to and disturb this gas while imparting to it a mostly positive charge. Metal of any kind struck with radiant energy of any kind tends to give up electrons or negative charges. Radioactive materials may simply be more responsive to agitation than other metals, as well as having the abilities in themselves to ionize gases or other materials to decrease losses due to excitation which must take place before the bulk of the energy becomes useful in another form. In other words, they absorb less energy, but other materials, although less efficient, will work.
31. The first machines Moray made probably used the old style coil tuning system.
32. One circuit in Moray's machine about 1925 to 1928 probably was a battery circuit replaced by condensers which activated the oscillation circuit. This follows the patent description for receiving very weak signals made by Nikola Tesla in patents numbers 985,953 to 985,957, November 5, 1901.

One key point to keep in mind is that condensers must be used to detect such small currents, and while such currents may not be measured by conventional means, they can be heard over sensitive earphones in conjunction with capacitors.

Resistance in the oscillatory circuit must be kept to an absolute minimum.

The capacitors must be normal, efficiently discharging capacitors.

The other circuit acted as the overflow or charging circuit to run the machine.

The first set of capacitors, probably the smaller set, simply kept the machine operating. Capacitors are important to the running of the machine.

Quartz crystals were probably the first detectors employed by Moray, and according to one report, the highest currents are picked up around the termination of a crystal

WHAT APPROACH TO TAKE IN EXPERIMENTING?

1. Duplicate the parts of the Moray valve and submit it to tests amplifying radio signals.
2. If possible, get a copy of the original patent application of the Moray valve.
3. See if there are any materials that amplify signals all by themselves.
4. Check to see if modern transistor components will work in certain applications in the valve.
5. Try submitting various crystal radio detectors, such as iron pyrite, while in circuit to bombardment by gamma (x-rays) rays, beta (cathode rays) particles, or fast moving alpha particles (helium nuclei). It may cause amplification of the signal.
6. Build an oscillator to work on the low frequencies to obtain energy.
7. Build an oscillator that responds to the movement speeds of alpha particles, beta particles, and gamma rays.
8. Compare the frequency of the klystron tubes used to drive electrons in a linear accelerator. That frequency might be useful in obtaining cosmic frequency response.
9. See if it is possible to cut lines of energy with lines of energy to generate electrical power.
10. String out a long wire for an antenna, and get a good ground. Then experiment with a negatively charged wire held in the air above the earth.