

A Dynamic and Substantive Cosmological Ether

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Abstract: The ether-drift experiments of Dayton Miller (c.1906-1929) using a highly sensitive Michelson light-beam interferometer, demonstrated systematic positive effects. Subsequent work by Michelson-Pease-Pearson (1929), Galaev (2001-2002) and others have experimentally confirmed Miller's result, which suggests: 1) the cosmological ether is substantive with a slight mass, and may be blocked or reflected by dense material surroundings, 2) Earth-entrainment occurs, and the best detections are made at high-altitude locations. 3) Miller's computed axis of Earth's net motion of ether-drift is in close agreement with findings from diverse disciplines, including from biology and physics, regarding ether-like phenomena with similar sidereal-day and seasonal-sidereal fluctuations. Neither an intangible static, or even a tangible entrainable but stagnant ether appear reconcilable with such results. A dynamic ether acting as cosmic "prime mover" is the alternative solution, but requires the ether to have both slight mass and specific motions in space. A solution is found in the bioenergetic research of Wilhelm Reich (1934-1957) who demonstrated an energy continuum with distinct biological and meteorological properties, existing in high vacuum, interactive with matter, reflected by metals, and with self-attracting (ie., gravitational) spiral-form streaming motions. Giorgio Piccardi (c.1950-1970) and his followers also demonstrated a metal-reflectable solar-modulated energy affecting the physical chemistry of water, chemical reactions and radioactive decay rates, correlated to Earth's spiral-form motion through cosmic space. More recent research on the annual variation in "dark matter wind" also shows very similar velocity shifts associated with Earth's spiral-form motion around the moving Sun, suggesting "dark matter" is a misunderstood substitute for a dynamic and substantive cosmological ether.

Positive Ether-Drift Experiments in the 1900s

The work of Dayton Miller stands out as the most remarkable of all ether-drift experiments,[1] with clearly positive results from over 12,000 turns of a Michelson-type light-beam interferometer, with over 200,000 individual readings undertaken at different months of the year starting in 1902 with Edward Morley at Case School in Cleveland (now Case-Western Reserve University) and ending in 1926 with his Mt. Wilson experiments. Miller also undertook rigorous control experiments at Case School Physics Department, from 1922 to 1924. More than half of Miller's readings were made at Mt. Wilson in 1925-1926, with the most telling positive results. Miller's interferometer was the largest and most sensitive ever constructed, with iron cross-arms 4.3 meters across, and standing 1.5 meters high, floated in a tank of mercury for easy and smooth rotation. Four sets of mirrors were mounted on the ends of each cross-arm to reflect light beams 16 times horizontally, for a total light path of 64 meters, round-trip.[2] Miller also became convinced, during the course of his experiments and given the small (but never "null") result previously observed by Michelson-Morley (M-M),[3] of an Earth-entrainment effect which necessitated using the apparatus at higher altitudes, and only within structures where the walls at the level of the light-path were open to the air, covered only with light materials. Only canvas, glass, or light paper covers were used along the light-beam paths of Miller's interferometer, with all wood, stone or metal shielding eliminated. His Mt. Wilson experiments transpired in a special shelter constructed accordingly, at 1800m (6000') elevation, without nearby geographical obstructions.[1,2]

By comparison, the original M-M interferometer had a round-trip light path of only 22 meters [3, p.153], and the experiments were undertaken with an opaque wooden cover over the instrument, situated in the below-ground basement of one of the large stone buildings at Case School in Cleveland (~300' elevation). The published results of the widely misquoted M-M experiment reflected only six hours of data collection, over four days (July 8, 9, 11 & 12) in 1887, with a grand total of only 36 turns of their interferometer. Even so, M-M originally obtain a slight positive result, and they expressed the need for more experimental work at different times of the year to avoid "uncertainty". Miller used an interferometer with nearly 3 times the light-path sensitivity as M-M, with 333 times as many turns of the interferometer.[2]

By 1928 and from his measured interferometer results of ~10 km/sec displacement, Miller computed the Earth was moving at a speed of 208 km/sec towards an apex in the Northern Celestial Hemisphere, towards the constellation Draco, right ascension of 17 hrs (255°), declination of +68°, within 6° of the pole of the ecliptic, and 12° of the Sun's apex of rotation.[4] Miller believed the Earth was pushing "northward" through a stationary but Earth-entrained ether in that particular direction. By 1933, for reasons discussed below, he changed his view and argued that, while his speed and axis-of-drift calculations were correct, the *direction of motion along the axis* was towards an apex in the Southern Celestial Hemisphere, towards Dorado, the swordfish, right ascension 4 hrs 54 min., declination of -70° 33' (south), in the middle of the great Magellanic Cloud and 7° from the southern pole of the ecliptic.[1, p.234]

While he was alive, Miller's work was given serious considerations, including by Einstein, who correctly understood his relativity theory was threatened. (2, p.114) Subsequent work by others, including by Michelson himself were to generally corroborate Miller. For example:

1. In the late 1920s, Michelson-Pease-Pearson[5] (M-P-P) used Michelson-type turning cross-beam interferometers; the first two of their tests, using interferometers of 22 and 32 meters round-trip light-path length, but at low altitudes, got "no displacement of the order anticipated", third trial atop Mt. Wilson using a 52-meter light-path interferometer and therefore more in keeping with Miller, got a positive result, a measured displacement of "no greater than" ~20 km/sec. However, this result was dismissed by M-P-P apparently due to their *a-priori* and unwarranted rejection of a substantive and Earth-entrainable ether, which led them to expect a much larger result.

2. Kennedy-Thorndike in 1932 reported a ~24 km/sec result, but they also *a-priori* dismissed a substantive and Earth-entrained ether, prejudicially claiming their result to be "null". [6]

3. M-P-P in 1929 pursued standard "speed of light" measurements in a one-mile long partially evacuated steel tube, [7] lying flat on the ground, but even in these inhospitable conditions for detection of ether-drift they observed — but admitted only to a newspaper reporter — variations of ~20 km/sec. [8]

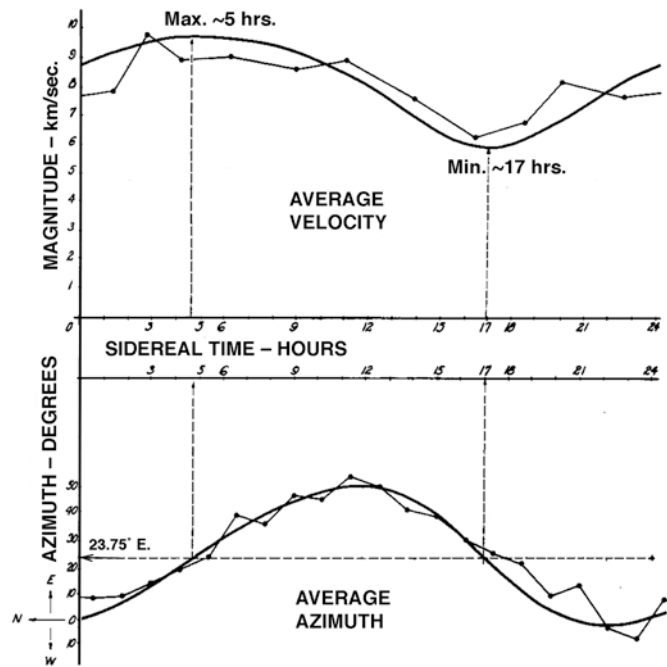


Figure 1: Average Velocity and Azimuth of Global Ether Drift, from Miller's Mt. Wilson Experiments. (1928) *Top Graph:* Average variations in observed magnitude of ether-drift from all four seasonal epochs of measurement, by Sidereal Time. Maximum ether velocity occurred at ~5 hrs sidereal and minimum at ~17 hrs sidereal. *Bottom Graph:* Average azimuthal readings by Sidereal Time, with the baseline as taken from Miller's 1933 revised seasonal averages. [4, p.365; 1, p.234] The averages for the four seasonal epochs together yield a mean displacement of 23.75° east of north, very close to the Earth's axial tilt of 23.5°. Coincidence? **

After the death of Michelson in 1931, and Miller in 1941, there was a near silence on the question of the ether-drift and an entrainable, substantive cosmological ether in space. The world of science followed the lead of Einstein and his relativity theory which demanded space to be free of any ether with tangible properties [9] much less of variations in light-speed — ether-drift experiments yielding positive results were simply never mentioned, as if they had never been undertaken. Finally, in 1955, with the cooperative encouragement of Einstein, a team led by one of Miller's former students, Robert Shankland, undertook a re-analysis of Miller's ether-drift data, in what can only be called a highly prejudiced and incompetent post-mortem. [10] The overriding consideration ignored by the Shankland team was the highly structured nature of Miller's data, which for all four seasonal epochs pointed to the same set of sidereal coordinates for ether-drift — which vanished if the same data were organized by civil clock-time** — demonstrating a very real cosmical influence. [4, pp.362-363] I have already discussed the severe problems in the Shankland, et al critique of Miller, [2] and so will not repeat those issues here, except to emphasize their claim to have "refuted" Miller is *bogus*, based upon biased data selection, with negative presumptions Miller had already rebutted years earlier, and misunderstandings of basic ether-drift interferometry.

By the late 1990s, Maurice Allais had also made a re-investigation of Miller's ether-drift research, finding additional non-random patterns in the Miller data which he related to his own work on anomalous pendulum behavior during solar eclipses. [11]

The most significant development since Miller has been the experiments of Yuri Galaev of the Institute of Radiophysics and Electronics in the Ukraine. Galaev made independent measurements of ether-drift using radiofrequency [12] and optical wave bands. [13] His research not only "confirmed Miller's results down to the details" [14] but also allowed computation of the increase of ether-drift with altitude above the Earth's surface (calculated to be 8.6 m/sec per meter of altitude). Miller's own altitude-dependent results suggest the speed of the ether-drift at Mt. Wilson was ~5.14% of the estimated speed of the "ether-wind" in open space (Miller's reduction factor "k", [1, p.234-235]), though with seasonal and Sidereal-day variations, as discussed below.

These experiments are all suggestive of the older concept of the cosmological ether as a fluidic medium, a tangible "stuff" which can be entrained or slowed down as it moves close to the Earth's surface. This fundamental property of ether, which repeatedly shows up in the experimental results — of being a fluidic substantive medium with a very slight mass and thereby interacting with matter, which can be slowed by matter obstructing its path and which thereby may impart a slight momentum to obstructing matter — is of central importance for integrating ether-theory into modern cosmology. We may construct a model directly from these results, which do not require reference to metaphysical constructs such as relativistic curved space-time, nor to Lorentz-type contractions of our measuring rods. To do so, we must reference other researchers who, like Miller, discovered a cosmological phenomena of an "ethereal" quality, but which nevertheless had measurable substance.

** Also see the Addendum Figure on the last page.

Reich's Dynamic Ether-Like Orgone

From 1934 to 1957, Reich produced a series of experimental reports documenting the existence of a unique form of energy, called the *orgone*. [15, 16] By his determinations, orgone energy charged the tissues of living organisms and played a fundamental role in life processes. It also existed in a freely-moving dynamic form within the atmospheric ocean, as a postulated *orgone energy continuum*. It was also identified within high-vacuum tubes, and was postulated to exist in cosmic space. [17,18] The properties of Reich's orgone were remarkably similar to Miller's ether:

A) Mass-free orgone energy filled all space, much like a cosmic ether, but it was in constant *lawful* motion, with flowing or streaming motions but capable of concentrating or building up in one place, while rarefying or diminishing in another. The orgone could penetrate matter easily, but also weakly interacted with it, being attracted to and charging all matter. Metals rapidly discharged, or reflected it, allowing special metallic-dielectrical enclosures (*orgone energy accumulators*) to be constructed, which yielded anomalous stimulation of plant growth, tissue regeneration and healing effects, as well as anomalous physical effects such as spontaneous heat production, decreased rate of electroscopical discharge, and anomalous ionization effects within orgone-charged high-vacuum and Geiger tubes. [16,19,20,21,22] Nearly all of his experimental claims have been independently replicated and confirmed by other scientists. [22]

B) Based upon his observations of the Earth's *orgone energy envelope*, which rotated from West to East *faster* than Earth rotation, and the existence of a discrete energy stream moving SW to NE within the atmosphere, Reich postulated the existence of large spiraling streams of orgone in cosmic space. He noted one streaming motion along the plane of the Milky Way Galaxy (called the *Galactic Stream*), with secondary streams flowing parallel to the plane of the Solar System Ecliptic and to the Earth's equator (the *Equatorial Stream*). Reich further argued, based upon atmospheric and telescopic observations, that the cosmic energy streams would attract each other, superimpose in a spiral form and condense to create new matter out of the cosmic energy substrate. [18] Reich described these spiral wave-forms, giving them the German name *Kreiselwelle* (*spinning wave* or, literally, "gyroscopic-wave"), which he believed underlay various biological, atmospheric and cosmic motions. [18,23] By Reich's theory of *Cosmic Superimposition*, [18] The rotation of planets on their axis, and the revolution of planets around their suns, and of moons around planets, were all products of giant superimposing streams of cosmic energy.

C) Reich never cited Miller's work, but he considered the older ether theory to be a "useful concept". Like Miller, he also noted orgone energy moved faster and was more active at higher altitudes, and he identified the North Hemisphere Spring Equinox, as well as the peak of the Solar sunspot-abundance to be times of increased orgone energy charge and activity.

Reich's findings and theory of *Cosmic Superimposition* agrees with much of acknowledged astronomy, in that moving stars and orbiting planets describe large open spiral-forms in space. However, no special emphasis is placed upon this fact, given the as-

sumption of "empty space". Only a few textbooks make mention of it. Reich, by contrast, worked out his own special functional equations of gravitation and pendulum behavior, [25] based upon his insights on the spinning wave, and space being filled with an energy-rich substrate. His findings are highly compatible with the concept of a dynamic ether, which would also fulfill the role of being a *cosmic prime mover*, but not with the concept of a *static* or *stagnant and immobile ether*, nor even with Miller's *passive Earth-entrained ether*. Reich's universe was animated by streams of flowing and pulsing cosmic orgone energy, which moved the planets and suns along on their paths in the heavens, much as a ball floating on the water is moved forward by the water waves. [18]

The Ether: Static, Earth-Entrained, or Dynamic?

Ever since Isaac Newton, many physicists considered the ether to be a *static* or *stagnant* phenomenon, something which existed throughout the cosmos, but primarily as a *non-moving and immobilized* background medium. A static ether or "Absolute Space" was a necessity for Newton, who basically eliminated all of its tangible properties save for the ability to transmit light waves. This was done in large measure to reconcile his mathematical *laws of motion* with his theology. Newton appeared motivated to "heal the schism" between Science and the Church, which had developed since Galileo, by *ridding the universe of any notion of cosmic prime mover, other than deity*. The ether was henceforth declared dead, static and without tangible properties (by which it might influence celestial motions), and God was rescued from the unemployment lines, his role as the source of all universal motion preserved. [24] This viewpoint is not apparent from his mathematics, but is a part of the underlying philosophy. Consequently, M-M and many others always looked for, but never detected, an a static substance-less ether which would not be entrained as the Earth swiftly moved through it.

In fact, Miller's view diverged from the concept of a *static* ether only insofar as was necessary to explain an Earth-entrainment phenomenon, and ether-reflecting capabilities of dense matter which his empirical measurements demonstrated. Miller's ether was *stagnant*, though fluidic and with sufficient substance to become entrained at the Earth's surface. Consequently, he never accepted the preliminary results of M-M, and sought to undertake ether-drift measurements at higher altitudes and at different seasons. By 1933 he concluded the Earth was pushing through a stagnant but Earth-entrained ether, towards the constellation Dorado, near the South Pole of the Ecliptic. But this view always contained the seeds of a major contradiction.

If one assumes the ether is stationary or stagnant but has some slight mass, and therefore is a tangible "stuff" which can interact with matter, and become "entrained" along the Earth's surface, then by definition this "entrainable ether" will act as a *braking force against planetary motions over time*. And given enough time, such an entrainable but basically stagnant ether might eventually bring all cosmological motion to a standstill. In order to make the universe function, one is forced to postulate some other independent energizing force to create all cosmic motion, to oppose the "brake" of the stagnant but entrainable ether. Or, one must eliminate all the tangible properties of the ether, and

render it into an abstraction. One thereby arrives back at the very same postulate of Newton: *the need for a counter-force in nature, aside from ether, to constantly refresh cosmic motion*, or at the very least to get everything started in one "big bang". One is forced to invoke some metaphysical principle, something more than ordinary gravitational forces, which appear insufficient to fully overcome the long-term "cosmological brake" of an entrainable but stagnant ether. Or, the ether must be made abstract, intangible.

A third solution, which appears to have been steadfastly avoided by Newton, Michelson, Miller, Einstein, and nearly everyone else except for Reich, is to *give the cosmological ether not only substance and tangible properties, but also dynamical properties of spiral-form motion, which reflect observed planetary motions*.

Miller's 1928 Versus 1933 Conclusions

There is an astonishing *empirical* agreement between Miller and Reich. Figure 2 gives a rough approximation of Miller's observed conclusions, which can be interpreted as Miller proposed, or as Reich proposed. The "X" marks on the globe in Figure 2 represent the interferometer at different positions throughout the day, and one can see how the ether-flow would intersect the interferometer cross-beams at different angles as the Earth rotated.

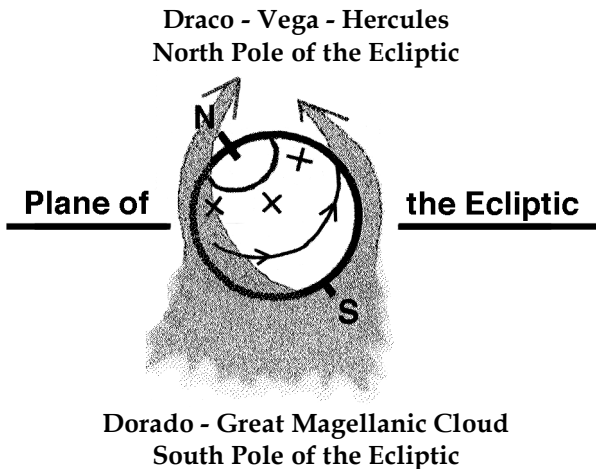


Figure 2: Relative Motion of the Earth and Ether. Is the Earth pushing southward through a passive, stationary ether, or is the ether dynamic, similar to Reich's orgone, streaming northward in a superimposing spiral spinning-wave, and carrying the Earth-Sun system with it? The "X" marks on the Earth diagram represent Miller's interferometer cross-arms at different times of day, showing how the direction of ether-wind would vary according to civil time, but still remain relatively constant according to sidereal coordinates.

As mentioned above, Miller's final conclusions of 1933 were that the Earth was drifting towards a point near the constellation Dorado, close to the South Pole of the Ecliptic.[1, p.234] However, his *earlier conclusion* made in 1928 from the same data, viewed the direction of motion along the *same axis of ether-drift*, but in the *opposite direction*, towards the North Pole of the Ecliptic.[4] Miller's original calculations of this northerly apex are more compatible with a dynamic theory of ether drift, where the ether flowed and moved *from Dorado generally towards the northern pole of the ecliptic (Draco)*, a movement which would carry the

Sun-Earth-Moon system along with it as it moved, though only a small portion of the ether's velocity could be detected (~10 km/sec) due to Earth-entrainment. The interferometer alone, as he noted, could determine "...the line in which the motion of the Earth with respect to the ether takes place, but does not determine the direction of motion in this line." [1, p.231]

Today, the accepted direction of the Sun's local movement is towards Vega, in the constellation Lyra, which lies in the middle of a small triangle created by the constellations Draco, Hercules and Cygnus. All these constellations are reasonably close to the northern pole of the ecliptic, and to Miller's northern polar axis of ether-drift. They all are found close to the plane of the Milky Way, as if the Solar System is spiraling merrily along, caught in one of the giant sweeping energetic motions of one of the Galactic arm bands. Figures 3 and 4 show these relationships, to which the following structure and patterns can be added.

Miller's data provides velocity calculations which show both hourly variations by sidereal time, and also seasonal variations according to the four monthly epochs of his Mt. Wilson experiments. They are as follows:

Sidereal Hour Variations: Miller 1928 (see Fig.1)

Maximum velocity ~10 km/sec at 5 hrs sidereal

Minimum velocity ~6-7 km/sec at 17 hrs sidereal

The *Sidereal Hour Variations* in ether-drift velocity are most easily explained as being due to the shielding effects of the Earth's mass upon the interferometer at 17 hrs, and the alignment of the interferometer for maximal detection of ether-drift at 5 hrs. One may get a rough approximation of this from Figure 2, where the "X" indicating the interferometer on the far left-side of the Earth diagram is fully exposed to ether-wind, while the "X" on the far right-side is largely shielded by the mass of the Earth. In fact, Miller's measured velocity *and azimuthal* variances over the Sidereal Day follows such a pattern.[25, p.142-143]

Seasonal Variations: Miller 1933 [1, p.235]

15 September 9.6 km/sec

2 December – velocity minima

8 February 9.3 km/sec

1 April 10.1 km/sec

2 June – velocity maxima

1 August 11.2 km/sec

The *Seasonal Variations* in ether-drift velocities are also easily understood as the consequence of the combined motion of the Earth around the Sun, and the Sun's translational motion through the Galaxy. Figures 3 and 4 are derived from a combination of Miller's and Reich's cosmological ideas, in accordance with known astronomy. From April through August, the Earth moves quite a large distance through the heavens, while in December and January, the Earth moves through only a relatively small distance of space. The Figure 3 distances for B-C-D from March 21st through September 21st, for example, are approximately twice those for D-A-B, which cover the period from September 21st through March 21st. There is a period when the Earth accelerates to maximum speed, starting around the time of the Spring Equinox (B towards C) followed by deceleration (C towards D)

where the Earth then enters a region where it moves relatively slowly in relationship to the background of space (D-A-B). With the cycle completed, there is rapid acceleration the next March. It gives the impression of a strong energetic wave or pulse, which

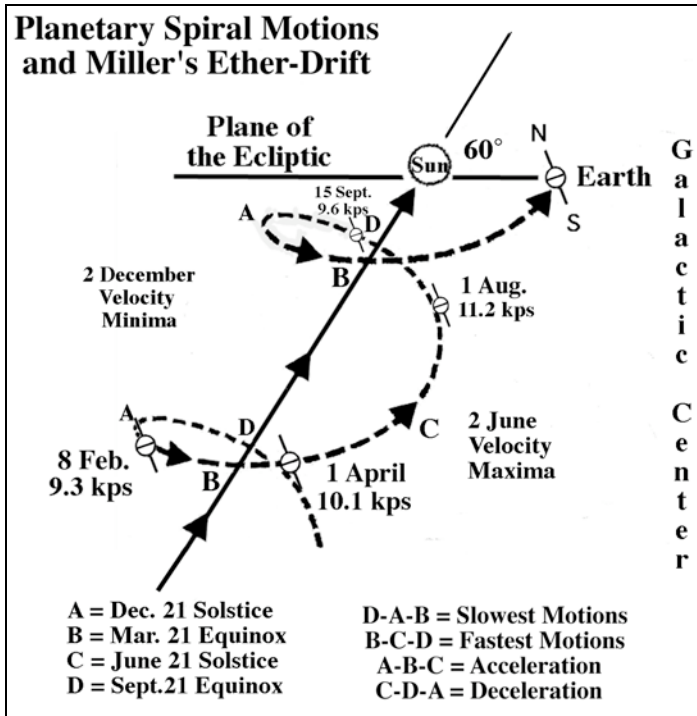


Figure 3: Earth Spiral Motion Around the Moving Sun. The Earth moves a greater distance during the period March-September (B-C and C-D) than during the period September-March (D-A and A-B). This acceleration and deceleration over the course of the year appears related to the motion towards or away from the Galactic Center. The graphic includes the measured season variations in ether-drift velocities from Miller's Mt. Wilson experiments, which are in keeping with this spiral-form model. Note: these only reflect measurements at the interferometer, and due to Earth-entrainment should not be confused with the net speed of the ether-wind or of the Earth itself through open space.[25]

imparts momentum to the Earth, accelerating it towards the Galactic Center in the months immediately after March, and then decelerating when the Earth retreats away from the Galactic Center after September. Similar changes in velocity affect all the other planets.

Reich noted this variation in Earth-speed as well as the 62° angular relationship between the rotating Galactic Plane, and the Earth's Equatorial Plane.[18,25] In a similar way, the Solar System Plane of the Ecliptic is also inclined to the Sun's path towards Vega by ~60°. And a similar set of angular relationships exist in Miller's ether-drift measurements, which "...oscillated back and forth through an angle of about 60°..."[4, p.357] Miller and Reich both emphasized similar translational movements of Earth through cosmic space, as demanded by their respective findings.

Piccardi's Biometeorology and "Dark Matter"

A similar set of observations were made by the Italian chemist, Giorgio Piccardi[26] in cosmic influences upon laboratory phase-change experiments under constant environmental condi-

tions (such as the precipitation of bismuth chloride from solution, or the freezing of supercooled water). Piccardi eventually concluded the helicoidal movement of the Earth around the Sun was

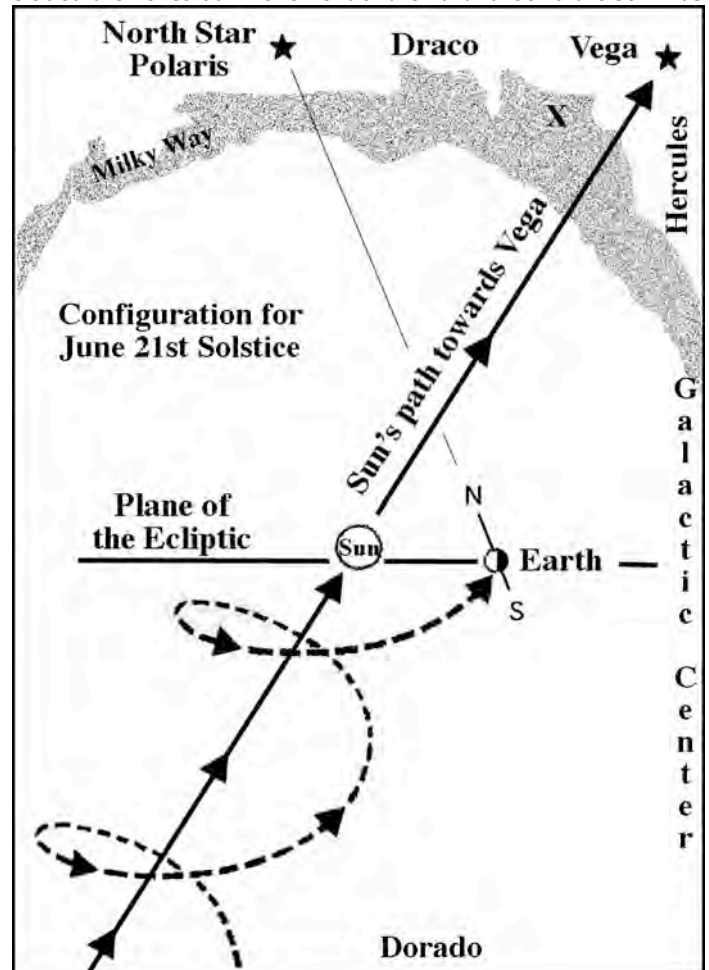


Figure 4: Spiral Motion of Sun-Earth System The Earth (shown here in summer solstice position) moves around the Sun in a spiral, while the Sun moves towards Vega. The constellation Draco marks the approximate location of the northern pole of the Plane of the Ecliptic, which is within around 7° of the north pole of Miller's computed axis of ether-drift (at the "X"). The Plane of the Ecliptic is inclined with the Sun's path by around 60°, giving rise to seasonal variations in the Earth's speed of motion.[25]

the determinant which imparted the anomalous seasonal variations in his experiments, peaking in the Northern Hemisphere Spring-Summer period. Piccardi's anomalous cosmic factor could be influenced by metal enclosures very similar to Reich' orgone energy accumulators or Miller's ether-shielding, and expressed itself globally. That is, the phenomenon affected simultaneous experiments in both the Northern and Southern Hemispheres in an identical manner, indicating the phenomenon affected the entire Earth all at once, and was not related to seasonal environmental factors, such as temperature or humidity. He noted:

"If space were empty, empty of fields of matter and inactive, a consideration of this type would be of no importance. But today, we know instead that both matter and fields exist in space." [26, pp.97-98]

In a similar manner, the biologist Frank Brown at Wood's Hole in Massachusetts noted "cosmic" sidereal-day and seasonal variations in biological clock variations of a variety of creatures maintained under constant environmental conditions, most of which are in keeping with the cosmological model presented here.[27] There is a rich literature from various disciplines documenting similar anomalous sidereal-day and seasonal-cycle variations, suggestive of cosmic ether-influences.[19, p.141-142]

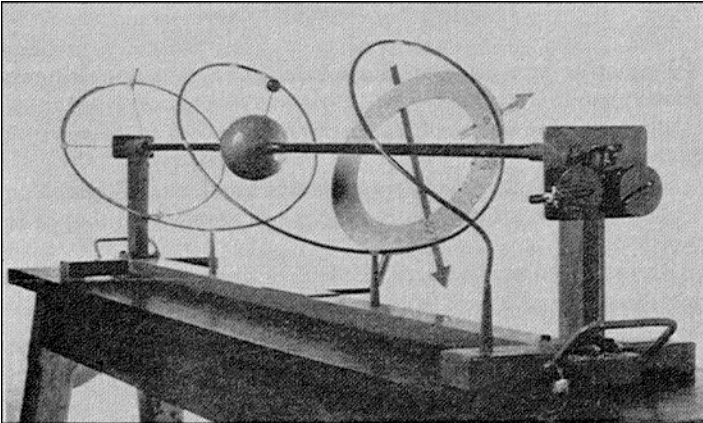


Figure 5. Piccardi's Animated Model of the Helicoidal Motion of the Earth Around the Sun, as presented at the Brussels World-Fair in 1958.[26, p.98]

Finally, we may reconsider the many recently measured seasonal variations in "Dark Matter Wind",[28] which are acknowledged as being the consequence of the Earth's spiral-form motion through the cosmos, though without any reference to ether-drift. When combined with the 30 km/sec velocity of the Earth around the Sun, and the 232 km/sec velocity of the Solar System through space, there is a postulated "dark matter wind" velocity maximum on 2 June and velocity minima on 2 December, very much as diagramed above in Figures 3, 4 and 5. "Dark matter" has always remained an elusive entity, suggested by virtue of gravitational anomalies indicating a very slight mass within open space, but essentially transparent to light-waves except as seen in galactic haloes. I suggest, "dark matter" — now shown to have a peak "wind velocity" in agreement with the cosmological ether-motions as determined from the integration of Miller, Reich and Piccardi — is nothing more than the *substantive and dynamic ether of space*.

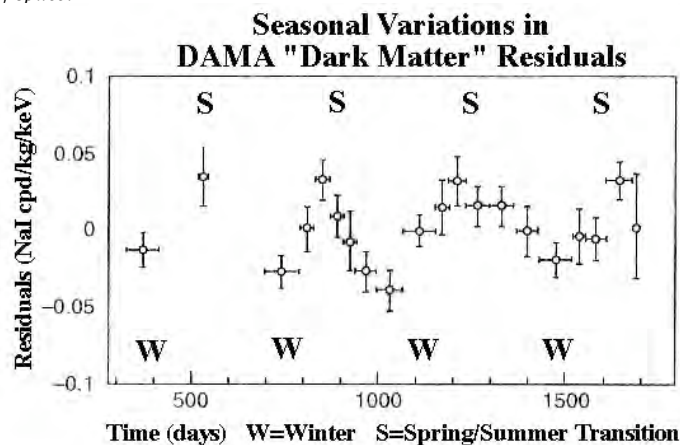
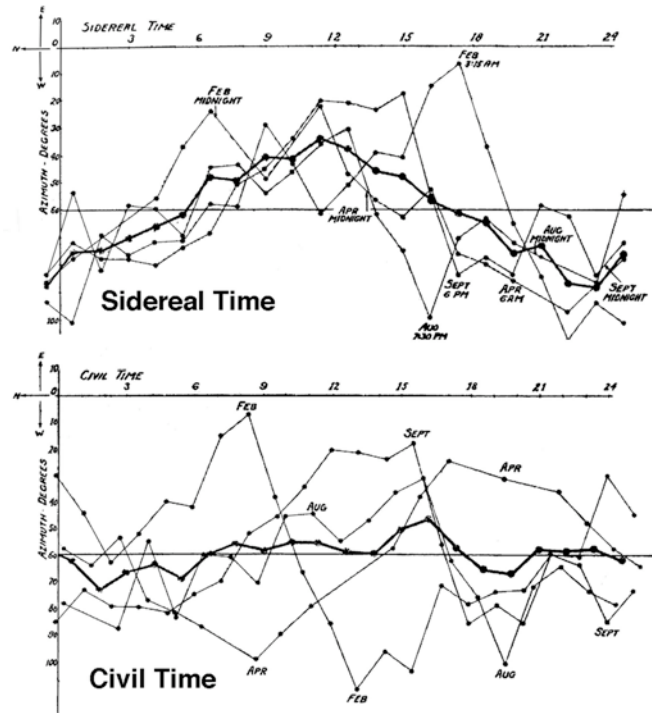


Figure 6: Annual Variations (N. Hem.) in "Dark Matter Wind", from the DAMA Project in Italy (after Bernabei) [28]

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ADDENDUM: Miller's data organized by Sideral Time versus Civil-Clock Time



Sidereal Versus Civil Time Display of Ether-Drift Data, from Miller's Mt. Wilson Experiments. (1928) *Top Graph*: Miller's data organized according to sidereal time coordinates, showing an anomalous structured variation in the data. The Azimuth of the signal shifts from a maximum Easterly component at around 12 hours Sidereal to a minima Westerly component at 22.5 hrs Sidereal (comparable to the lower curve in Figure 1). *Bottom Graph*: The same data organized by Civil Clock Time coordinates, showing no structured pattern to the data. If the signal variations were due to some diurnal factor such as solar heating, the Civil Time graph would also show an anomalous patterned structure.