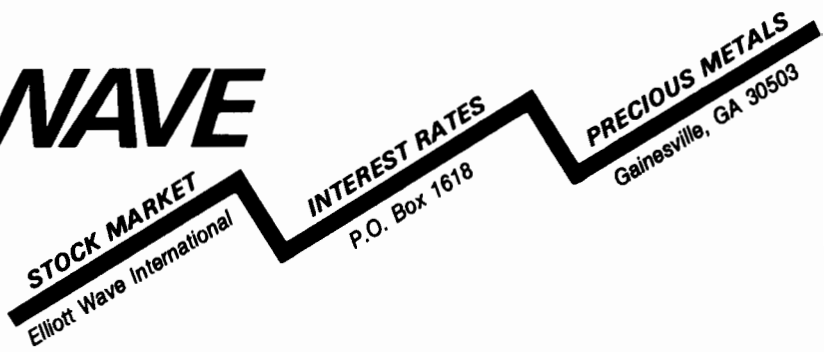


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From time to time, we publish guest essays that address our topics and live up to our standards. Paul Montgomery is an engaging writer, superlative market timer and a long-time friend. I hope you enjoy Paul's take on market analysis. —RP

Classical Philosophy and the Capital Markets

by Paul Macrae Montgomery

*With two dice you can manufacture what looks
like a business cycle...or price fluctuation.*

—Paul Samuelson

God does not play dice with the universe.

—Einstein

The quarrel between technical analytic theory and random walk theory is not easily resolved merely by appeals to the evidence, because their differences are basically conceptual rather than factual. The technical school interprets capital market data on the basis of a “Greek” world view, whereas the random walk school views the identical data from a “Modern” perspective. These two philosophies are fundamentally quite different and generally have been considered irreconcilable.

Greek thought, excepting atomism, was grounded most significantly on the “Harmony of the Spheres” and related notions of ratio, proportion and form attributable to Pythagoras. Epitomized by the Ideal Forms of Plato, the mathematical astronomy of Eudoxus, and the geometry of Euclid, Greek science was based essentially on harmony and continuity of pattern. Form was held to be so fundamental that it was proper to speak of “*formal causes*.” That is to say, that pattern itself has causal properties to the extent that matter is constantly striving to follow, or being driven to follow, some intangible, immaterial form or proportion. Matter was a secondary consideration inasmuch as the behavior of material particles was viewed as essentially a product of the basic order and fundamental forms of nature. Greek science reflected this philosophy throughout. Aristotle’s biology with its “fixity of type” is one example, and the medicine of Hippocrates with its concern for temporal and spatial pattern is another. Such a *Weltanschauung* is virtually nonexistent today, but the technical analytic theory of capital market behavior constitutes a rare contemporary example of the Greek point of view. Its claim, that market prices somehow tend to follow certain predeterminable patterns, is very firmly within the tradition of the formal causes of Greek thought.

Modern science and philosophy, however, are in violent opposition to this Greek thought. The Modern view virtually ignores the forms, harmonies and patterns that the Greek view

held to be fundamental and instead holds matter to be fundamental. Its philosophy is empiric and pragmatic, and its science views nature not as a single harmonious system but as an aggregation of material particles. The forms and proportions of geometry, mathematics and nature, which the Greek view held to be primary, are held to be at best secondary phenomena without any causal properties. The apparent harmonies and patterns that occur in nature are believed to be merely temporary effects produced by the behavior of discrete, discontinuous particles.

This materialistic, mechanistic, unstructured, particulate view of the universe, traceable to Leucippus, Democritus, Epicurus, Lucretius and the other atomists, now completely dominates contemporary thought. It returned to vogue in the seventeenth century concurrent with the development of the mechanical astronomy of Galileo and the physics and astronomy of Newton. This atomistic conception of nature next appeared in the chemistry of Lavoisier, with its emphasis on “Elements” as basic “building blocks” of the physical universe. It became dominant in medicine and biology after the discoveries of Harvey and Darwin. Finally, Schleiden and Schwann gave Modern thought its basic biologic “building block,” the “cell.” Interest since has shifted from the cell to the gene to the DNA molecule, but the philosophic significance is identical, inasmuch as the predominant reaction to these scientific discoveries has been to interpret them in the context of a materialistic, particulate, and discontinuous view of the biologic universe, identical to the prevailing view of the physical universe. The mechanistic conception of biologic systems eventually produced the psychologic dynamics of Pavlov and Skinner, and the political and economic systems of Marx, Engels and Keynes. Finally, this materialistic, discontinuous, action/reaction philosophy extended itself even into capital market theory, as latter-day atomists have proclaimed that market prices are “random” and follow no forms beyond those of chance and “Brownian Motion.”

It is easy to see, even from this very cursory review, why the essentially Greek viewpoint of technical analysis has been incompatible with the archetypically Modern viewpoint of random walk theory. The former maintains that market prices reflect a system of patterns and forms which continually perpetuate themselves in the midst of continuous economic flux. The latter maintains that any patterns or forms that may appear in the market merely reflect a temporary relationship among price data, which are themselves the mechanistic result of myriad disconnected, randomly surfacing economic events. Therefore, price “patterns” and market “forms” are merely transient epiphenomena, totally without causal or predictive significance.

The success of Modern science is beyond question, so it is entirely appropriate for the less exact and less mature sciences such as economics to attempt to incorporate its principles, as random walk theory has done. Recently, however, the entire Modern point of view, with its emphasis on discontinuity rather than on continuity, and on particles rather than on patterns, has been found to be in need of *drastic* revision.

Modern thought is valid in the proper context, but it is inadequate to explain, or even describe, all phenomena. The discoveries of wave mechanics, quantum theory, and most particularly relativity theory, require that the all but forgotten Greek concepts must be given equal status with the Modern. Einstein united these previously incompatible philosophies with his insistence that *fields both condition and are conditioned by the particles in it*. Relativity field physics retains the Modern position that constituent elements have causal properties, but it also reaffirms the neglected Greek claim that the unity and forms of nature are themselves causal factors. The implications of this discovery are so important and so

universal that *all* the sciences and *every* area of human activity must be reexamined with an eye towards bringing them in line with field physics. Thus far, the most spectacular result of just such a thoroughgoing reexamination of modern thought is the verified Electrodynamical Theory of Life.¹ It now has been theoretically and empirically demonstrated that an electrodynamic field actually compels atoms and electrons to take certain pathways in living systems, directing growth, maintaining idiomorphic forms and perpetuating characteristic behavior patterns in the midst of physiochemical flux. Since capital market behavior is a subcategory of human behavior, it follows that form and pattern should be evident in market price data as well, which is precisely the primary assumption of technical analytic theory.

Failing to realize its implicit philosophic bias, modern economic science tends to confuse *data* with *evidence* and tends to exclude from consideration any system not based on its own materialistic first principles. Thus, much of what passes for “science” in the field of economics is actually pure speculative philosophy. Therefore, much of the criticism of technical analysis is ultimately nothing so much as fanatic assertion.

Again, this is *not* to say that the Modern viewpoint is invalid. Economic news events most certainly *can* have an effect on stock and bond prices. According to certain carefully defined parameters, these prices *may* appear to replicate a random walk. It definitely is to say, however, that the random walk viewpoint is *inadequate* because capital market prices *also* follow certain general forms and patterns regardless of the timing or content of spasmodic economic news releases. Therefore, it is extremely important to investigate empirically the existence and nature of these hypothesized market patterns. Fortunately, a great deal of this natural history, or data collecting, work already has been completed. It is quite noteworthy, though not necessarily surprising, that many of the empirically derived forms of technical analysis are identical to the deductively derived forms of Greek thought.

The forms and proportions that Greek thought held most primary were the harmonic ratios of the musical scale and the Golden Mean (which are in a few cases one and the same). Expressed mathematically, the Golden Mean (also called *phi*) is 1.618 to 1 to .618. This proportion also describes the ratio between consecutive numbers in the Fibonacci sequence. In geometry, this proportion governs the Golden Section, Golden Rectangle and Golden Spiral (see Chapter 3 in *Elliott Wave Principle*). Both Pythagoras and Plato apparently felt that this proportion somehow contained “The Secret of the Universe.” Newton had the logarithmic spiral engraved on the headboard of his bed, and Kepler, one of the grandest minds ever known, felt that this proportion described virtually all of creation. It is this very proportion that Elliott wave theory claims describes virtually all significant movements in the capital markets.

The history of science provides numerous examples of such “mathematic curiosities” eventually proving to have a very profound real world basis. Kepler, for example, related the ratio and proportions of the vibratory rate of the notes of the musical scale to the rate of orbit and eccentricity of all the known planets. Not only did this musical model accurately predict every planet’s orbit, but because there was a missing “note,” Kepler claimed that there was a missing heavenly body. Nearly two centuries later, Ceres, the largest asteroid, was discovered precisely where this quaint ratio analysis suggested it would be.

Similarly, a century ago, Dimitri Mendeleev noted that the elements, when numbered according to the ratios among their atomic weights, tended to repeat fairly similar properties at every seventh element, just as the notes of the musical scale. Because there were a few gaps, or “missing notes,” in the sequence of ratios, he predicted the existence of three completely unknown elements, and described their characteristics. Within a decade, this

ratio-based prophecy was fulfilled exactly by the discovery of gallium, germanium and scandium.

Similarly, “Balmer’s Ladder,” a sequence of harmonic ratios developed more than a century ago by an obscure Swiss mathematics teacher, was considered nothing more than numerology until Niels Bohr demonstrated that these relationships correspond exactly to the intervals of electron shells within the atom. Thus Balmer’s ratios, this “quaint mathematic curiosity,” became the foundation of modern quantum mechanics.

This story merits some elaboration here because of certain additional similarities between the Balmer sequence and the Fibonacci sequence. Leonardo Fibonacci originally presented the Fibonacci sequence in *Liber Abaci*, the treatise which in 1202 introduced Arabic numbers to the Western world. In this historic work, Fibonacci asked: *How many pairs of rabbits placed in an enclosure can be produced in a single year from one pair of rabbits if each pair gives birth to a new pair each month, starting with the second month?* The answer is 144 pairs, the number of pairs each of the twelve consecutive months being 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89 and 144. Each number in the Fibonacci sequence is the sum of the previous two numbers. Once the sequence gets underway, the ratio of any number to the previous one always approximates 1.618. Thus the Fibonacci sequence is the archetype of *gnomonic* expansion — that type of growth which always retains its basic proportionate form irrespective of the magnitude of change. It is, in modern parlance, the ultimate fractal.

A similar, if much less pervasive, fascination attended the sequence of ratios that Balmer discovered in 1885. What fascinated Balmer was the fact that the spectral lines of the element hydrogen followed a music-like sequence of ratios. For example, measured in angstroms, the lines demonstrated a curious, music-like sequence; viz., 5/9, 12/16, 21/25, 32/36, 45/49, 60/64, 77/81. Note that each denominator is a cardinal square in natural succession, and that each numerator is equal to four (4) less than its own denominator. Physicists of the day held that Balmer’s sequence was nothing more than meaningless numerology, or a quaint mathematical coincidence. However, this skeptical position was exploded when quantum theorist Bohr proved that these ratios corresponded precisely to the quantum intervals of the electron’s “gravic shells” within the atom. Not only did Bohr show that all three of Kepler’s Laws of Planetary Motion hold for the electron, but he also demonstrated that electrons can move only in those specific areas pre-identified by Balmer’s ratios. Whenever an electron absorbs or emits sufficient energy, it will leave its contemporaneous “shell,” or “orbit,” but irrespective of *how much* energy it loses or acquires, it must make a quantum jump precisely to another theoretic orbit. It can never meander in between the potential orbits described by Balmer’s ratio. This Balmer phenomenon is quite similar to the Fibonacci phenomenon frequently observed among market prices. For example, once sufficient energy is built up or dissipated in the market, prices will be forced from their contemporaneous level. But they apparently cannot go just anywhere; instead they tend to jump to the next “quantum” level as described by the Fibonacci sequence. Free market prices are not, of course, simple electrons, but are instead the net result of an infinitude of forces. Hence prices do not behave with either the consistency or the mathematic precision of Bohr’s electrons.²

Given the predictive results of the ratio-logical thinking of Kepler, Mendeleev and Balmer, it would hardly be unprecedented if the *phi* ϕ proportion or Fibonacci sequence, which has already proved useful in prediction, is eventually discovered to have a very profound scientific foundation. We find it particularly interesting to note that recent high resolution X-ray studies of the DNA molecule show that the internal structure of the double

helix follows this same Golden Ratio (see Figure 11-1 in *The Wave Principle of Human Social Behavior*). Furthermore, recent studies in neurophysiology suggest that the response times of certain cortical potentials of the human forebrain follow this identical ratio. Since the most fundamental form and functioning of the human organism appear to be organized on the basis of the *phi* proportion, it is not surprising that various human activities, such as bond price behavior, reflect this same property.

Why the *phi* proportion should be ubiquitous in the marketplace and throughout the animate and inanimate universe remains an open question. Conceivably, the formula $a=1.618d$ might describe some fundamental attribute of the electrodynamic fields that impose order on living and nonliving systems alike, just as the formulae $F_g = \frac{Gm_1m_2}{d^2}$ and

$\frac{P_1^2}{P_2^2} = \frac{R_1^3}{R_2^3}$ do for gravitation and planetary motion. That question need not concern us now; our concern here is the *fact* that this proportion has been shown to have predictive significance in the capital markets.

Perhaps when we learn more of nature's secrets, the logic behind these observed market phenomena will likewise become clear. The new discipline of chaos theory, with its observations concerning "fractals" and "self-similarity," seems to be addressing much the same phenomena that Elliott theory addresses. Also, the recently emerging science of "complexity" theory, among other things, deals with the phenomenon of "Increasing Returns" in economic systems as opposed to the conventional Law of Diminishing Returns, which underwrites classical theory but which fails to account for significant amounts of capital market behavior. Furthermore, its stated attempt to discover "*the general law of pattern formation in non-equilibrium systems*,"³ as Dr. S.J. Goerner remarked in EWT's Special Report of December 1992, is to a significant degree a formal attempt to explain the verities that market technicians have been describing and applying, if not altogether rigorously, for decades.

Some have argued that while the existence of non-rational forces within the marketplace may be a fascinating premise, actually pursuing such a will-o'-the-wisp is too "unscientific" to be of interest to serious market scholars and money managers. However, the verities of "science" are logically prior and temporally previous to man's discovery of them. Furthermore, the attitude that all these efforts are "unscientific" betrays a fundamental misunderstanding of the true nature of scientific inquiry. Scientific inquiry does not properly begin, as some would tell us, with the collection of hard facts and pure data. Nor does it begin with the projection of indubitable hypotheses, as others would have it. Proper scientific inquiry rather begins with the observation of *a problematic situation*, since it is the nature of the particular problem at hand that must determine what types of data are relevant to the situation and what sorts of hypotheses are appropriate to its solution. It follows that there are as many proper "scientific methods" as there are fundamentally different types of problems. The problem under consideration here—capital market behavior—has been so unsatisfactorily addressed to date as to require particularly unconventional scientific methods. The entire modern scientific enterprise is possible only because the Law of Conservation of Momentum applies to physical systems. Since mental states do not obey this law, traditional economic approaches, which are based on it, have severely limited application within an investment context and often are logically untenable.

While the laws that mental states *do* obey are largely unknown, one principle which the human nervous system clearly does follow is the “all-or-none law.” This law describes the fact that a neuron will not fire unless its threshold potential is met; but if and when this threshold is reached, the neuron will fire with its maximum potential, irrespective of the absolute energy brought to bear on it. Perhaps something analogous to this all-or-none phenomenon in collective behavior accounts for the tendency of market prices to make quantum leaps from one Fibonacci level to the next. Or perhaps something even more fundamental is at work here. For example, maybe this ratio describes some basic attribute of the electromagnetic field which maintains order in both living and non-living systems.

The investment problem is different from many other scientific problems. Money management constitutes a perpetual forced option among imperfect alternatives, because even when a manager does nothing, since he is not redeploying his assets, he is implicitly making an active decision to hold them, which is equivalent to a passive decision to repurchase them. Therefore, the money manager must, by definition, act continually, and he must do so in the face of constant, awesome uncertainty. This being the case, incomplete empiric data and partially developed concepts— even probabilistic principles—that would be quite unacceptable in the exact sciences, are unavoidable aspects of investment decision making. Another related aspect of the investment problem is similar to the “multi-body problem” of physics, wherein there are such a tremendous number of constantly changing variables impinging upon a point that it becomes virtually impossible to ascertain the specific effect of any one factor at any one time. The investment problem is unique in that even when the absolute values of individual variables *are* known, the precise *significance* of these variables at any particular time is never known. So the fact that non-rational market factors are as yet not fully quantified can hardly disqualify them from serious consideration. *Most* of the variables in the investment equation are by their nature nebulous and difficult to quantify.

Another distinctive characteristic of the investment problem—somewhat analogous to what physicists refer to as the Heisenberg Uncertainty Principle—is the fact that the very act of observation affects the result. In the exact sciences, for example, the more often a particular procedure has given a particular result, the greater the probability that the same result will obtain in the future. In the capital markets, however, the very fact that a particular procedure has been successful in the past may increase the probability that this particular procedure will *fail* in the future. The most brilliant stratagems can be rendered counterproductive if a significant number of competing professionals simultaneously attempt to profit from their application. This being the case, exclusively conventional approaches are likely to lead us into an analytic cul-de-sac, because no matter how accurate our calculations or how flawless our logic, if everyone else is making similar deductions at the same time, we are *all* likely to be on a fool’s errand. Only if we develop *original* approaches, or apply conventional principles in an *unconventional* way, are we likely consistently to generate excess returns. Furthermore, and contrary to presumption, highly original notions are often much *safer* than conventional ones because even if these original notions prove false, since the expectation of their being correct has not already been reflected in contemporaneous market prices, the worst likely result would be average returns. However, if a highly *conventional* notion should misfire, the result could be devastating, inasmuch as the belief in its validity has presumably already been incorporated into the price structure of the capital markets.

Because of these and other unique aspects of the investment problem, unique approaches are required. Classic economic theory and traditional fundamental analysis *do* properly address certain aspects of the investment problem. However, they are totally unscientific when dealing with *other* vital aspects of the problem, much as classical mechanics, while providing a valid description of some aspects of physical reality, is incapable of dealing with either its subatomic or macrocosmic aspects. The nature of the investment problem is such as to suggest that rather than being dismissed out of hand, unconventional approaches are precisely where one must direct his attention if he aspires to consistently superior returns. The success of certain technical approaches to market analysis suggests that the adoption of the Greek view of the primacy of formal causes is a prerequisite to achieving those returns.⁴

Paul Montgomery is a market analyst, personal and institutional money manager and stock broker. His work is often covered in Barron's and quoted by other analysts, and there's an audio interview with Paul in the Wall Street Uncut archives (<http://wallstreetuncut.com/wsuaArchive.htm>). Mr. Montgomery may be reached through the following contact information: Legg Mason Wood Walker, 600 Thimble Shoals Blvd, #110, Newport News VA 23601 (800) 338-8948 or (757) 873-3300.

NOTES

¹ Burr, H. S. and F.S.C. Northrup. (1935). "The Electrodynamical Theory of Life." *Quarterly Review of Biology*, no.10, pp.332-333.

² Editors note: It is premature to assert that prices do not move precisely, as one must be sure to have exhausted all avenues of inquiry along those lines. To the extent that imprecision is found to exist, we would then have to determine whether it resulted from a robustness or variability in collective thought or an imprecision in aggregate market prices as a tool for expressing it.

³ Waldrop, M. Mitchell. (1992). *Complexity: The Science at the Edge of Order and Chaos*, New York: Simon and Schuster, p. 299.

⁴ See also the discussion of "formological systems" in *The Wave Principle of Human Social Behavior* (1999, New Classics Library).