

“Scientific knowledge must pass through three stages before it can reach full effectiveness. First, discovery by the experimental researcher and his statement of the laws based upon it. Second, publication of that discovery and the teaching that spreads the information. Finally, the application of the discovery to some useful purpose.”

—Roger Burlingame

5 *The Invisible Messenger*

Individual human beings are distinctly different from each other, as you have seen.

But, in the mass, we all seem to march to the same drumbeat. We conform, almost as if an invisible messenger appears among us from time to time and gently whispers commands that we all proceed to follow blindly and without reason.

This is one of the most important lessons we can learn from history. Human beings, *in the mass*, have alternating periods of elation and depression. They become belligerent in cycles, producing wars, revolutions, and civil strife; this mass murder is then followed by periods of passiveness, constriction, and inaction.

At one period they will flock to the financial centers of the world and risk all their holdings on tulip bulbs, resort land, and that intangible called a stock certificate. At other times they are overwhelmed by plagues of doubt and they stampede to convert their assets into cash and gold.

During one swing of the millennium's pendulum they elevate creativity to a function approaching godliness. The artist, the musician, the poet, become the princes of heaven. Later, ambitions, instincts, and morality are submerged in the darkest of ages.

Why does our behavior alternate with such regularity?

Effect—Or Cause?

I lived through four years of college and well into the depression of the 1930's before I ever heard the word "depression" in connection with a business setback. The old word to describe this state of affairs was "panic." When I first heard the word "depression" I thought it was newly coined, but apt.

Sometime during that period, for some long-forgotten reason, I was reading through some 1875 and 1876 issues of *The New York Times* dealing with the severe hard times then being experienced in the wake of the 1873 panic. To my great surprise I noticed that they had used the word "depression" then. It wasn't new after all!

Are people depressed in a depression because business is poor? Or is business poor because people are depressed? I suspect it is the latter. Psychology defines depression as "an emotional state tending to general inactivity." What better term could be used to describe a state of mind that might bring about a business setback?

As a specific instance, I remember that in 1930, after a stroke from which he later died, my father was in what could be called a state of depression. He had lost some money in the 1929 stock-market crash, and it had become urgent that he immediately lower his previous standard of living.

"Don't you realize that you must move to a cheaper apartment?" I asked.

"Yes," he mumbled.

"Do you understand that you cannot possibly afford to stay in this one?"

"Yes."

"Then, will you move?"

"No," he answered faintly.

"Why not?"

"I don't know."

He knew that he should move. He knew that he must move—and yet his power to act seemed to be paralyzed.

I conceive that human beings in the mass may be affected by

forces in the environment which first elate them, then depress them. Their elation results in overexpansion; their depression, as in my father's case, results in inability to think logically or to act with any degree of common sense.

I also conceive that these forces, whatever they may be, also affect plant life, animal life, and our weather. That such forces do exist is based on the following chain of reasoning:

1. Almost everything fluctuates.
2. Many things fluctuate in cycles or waves.
3. Many of these waves (like our alternating red and black playing cards) repeat so regularly, so dominantly, and so many times, that they cannot possibly be accidental or ascribed to "chance."
4. If the wave, or cycle, is not repeating by chance, then something, some force, must "trigger" it.

When we discover the "force" or the "forces" we will have solved our mystery.

Internal and External Cycles

After we have ruled out the possibility that a cycle we have discovered may be accidental, it must fall into one of two categories. The rhythm has either an internal or an external cause.

Internal rhythms come in two varieties: dynamic or feedback. Dynamic cycles are caused by actions within a system. Many of your bodily rhythms considered in the previous chapter are dynamic. Like your heartbeat they have no external cause. Heartbeats, of course, may be momentarily influenced by outside forces—a pretty girl or a tiger loose on the street—but the *rhythm* is not controlled externally.

Prices too may have internal or dynamic cycles. The price of gumbos begins to climb. People note this and overbuy to protect themselves. Then gumbos are no longer needed, for everyone is overstocked. The demand slackens. Prices falter and begin to fall. People, seeing the falling prices, hold off from buying in expectation of even lower prices. Prices eventually get too low and

gumbos become a bargain. People begin to buy, prices rise, and the cycle starts over again.

Many of these dynamic cycles are of the utmost importance to specific branches of medicine, economics, and science. However, their existence and cause are known, for the most part, and in the study of cycles as such they are little more than curiosities.

Closely related to the dynamic cycles is the feedback group. To understand feedback consider the relationship between your furnace and its thermostat. When the air in your home becomes too cool, the thermostat clicks and the furnace blazes into action. When your house becomes warm, the thermostat shuts off and your house begins to cool, causing the cycle to repeat.

Another form of feedback cycle is the predator-prey relationship. Let us imagine that a certain type of bird can eat only a certain insect and this specific insect is eaten only by this type of bird. We begin with many birds and many insects. The birds have plenty of food and so they multiply. As the bird population increases, the insects get pretty well eaten up. Then, with no food, the birds die off. Now the insects have a chance and they begin to multiply. The birds have food again. They begin to multiply, and the cycle starts over. Under fairly constant conditions, the time intervals between the highs in this particular bird population can be very regular. Also, under reasonable conditions of uniformity, closed doors, closed windows, and a constant outside temperature, the intervals between our furnace going on can be fairly regular—a cycle.

All dynamic and feedback cycles have characteristics that indicate they are not triggered by outside forces. The only sort of rhythm that commands our attention is the sort that could *conceivably* have an external cause—a forced cycle.

Forced cycles are those where the regulating mechanism—the “trigger”—appears to be outside the system. You are *forced* to arise every morning because the rotation of the earth on its axis produces night and day. You are *forced* to put antifreeze in your car when winter approaches and you are *forced* to wear cooler and lighter clothing in the heat of summer.

I am using the word “forced” in the technical rather than

popular sense. Obviously, unless you have a very unusual wife, no one will hold a gun to your head to force you to arise in the morning. You don't *have* to get out of bed because daylight has appeared. Theoretically at least you can lie in bed as late as you like or as long as you like—several hours, days, months, or even years. But when you do resume getting up in the morning it will be at some multiple of twenty-four hours from the time you did it last. Your twenty-four-hour cycle has continued as a force whether you have been responding to it or not, and when you finally do respond, the timing is set for you by outside forces. It is the same with the cycles of other lengths with which this book is largely concerned.

To be able to distinguish between accidental, internal, and external cycles is of prime importance. If the cycle is accidental, we know it will not continue. If for three successions every fourth car you pass on the highway is a Volkswagen, it does not follow that three cars later you will pass another Volkswagen, except by accident.

At the other end of the scale: Even if you don't know the cause, you can count on the 12½-hour cycle of the tides, the twenty-four-hour cycle of the day, the twenty-five-hour cycle of the moon, the seven-day cycle of the week (man-made to be sure, but a forced cycle, nevertheless), and the twelve-month cycle of the year.

Between these two extremes is the great body of rhythmic cycles, any one of which may be accidental or dynamic or feedback or forced. If a cycle is accidental, it has, of course, no forecasting value. If it is dynamic or feedback, it has some forecasting value. If it is forced, it has a great deal of forecasting value.

Do External Forces Exist?

Despite evidence accumulated through many years, the case for the existence of outside forces that may cause rhythmic cycles has yet to be proved. We do not *know* that forces of this sort surround us, and if they do exist, what they are. No one has ever seen them, for they are as invisible as radio waves. Few people have even considered their existence and we can only assume they exist from the behaviors we have observed.

Radio and radio waves offer an analogy that presents us with one possible, though partial, explanation of our mystery. Before I proceed, let me repeat the word "possible" so that there will be no misunderstanding between us. I am only putting our clues on the table for your inspection.

We all know about radios and, in a general way, how they operate. You are aware that the room in which you are now sitting is filled with radio waves. You can't see, hear, feel, or smell them, but you know they are there because whenever you turn on your radio the waves are converted into sound.

You also realize that these radio waves bouncing around your room are not identical. Each broadcasting station transmits waves with a different number of cycles per second, and your radio receiver will respond to one or another of these vibrations depending on where you set your dial.

Now imagine that a man from Mars is a guest in my house. He is a good physicist but he knows nothing about radio or broadcasting stations. He examines my radio and after some time he is able to determine that when he sets the dial at 79.4, the radio will vibrate 79.4 thousand times per second. When he sets my other radio in the next room to vibrate the same way, *it plays the same tune.*

With these facts it does not take our brilliant Martian long to reason that both rooms are filled with a vibration to which both radios respond and that somewhere there is something that causes these vibrations. When he moves both dials to 98.2 and then 101.4, the same thing happens . . . and he assumes there must be a second generating force, somewhere, vibrating at 98.2 thousand times per second and a third vibrating at 101.4 thousand times per second.

But he has absolutely no proof that these waves or their sending stations exist. He has deduced their existence logically through his observation of the behavior of the little black boxes!

Now suppose that my man from Mars, while awaiting dinner, comes across some statistics and papers in my library that indicate that every ten years or so Canadian lynx are more abundant, creating a rhythmic cycle of great regularity, with their population increasing for four or five years and then decreasing for an equal

span of time. He also discovers that rainfall in London and rainfall in parts of India fluctuate in cycles of the same length, as does the abundance of ozone at Paris, the number of caterpillars in New Jersey, the abundance of salmon on both sides of the Atlantic, and many other phenomena. What's more, he learns that other things act as if they respond to forces with different time intervals—but still in cycles.

With all his Martian enthusiasm he exclaims, "This is amazing. What I have read is exactly like that radio thing—except that these different phenomena seem to be the receiving sets instead of those little black boxes. The black boxes vibrated in fractions of a second but there must be other external forces that vibrate in months and days and years instead of thousandths of a second."

"Now," he adds, "I shall ask my host to explain all this to me. He can tell me, I am sure, what makes the black boxes play the same tune when they are set at the same frequency. And he can also tell me what makes dozens and dozens of phenomena on this planet vibrate together as if they were all subject to the same force."

My friend from Mars overrates me. True, I can tell him something about radio waves and sending stations. I can explain "wavelength" as the physical distance, measured in meters, between two successive highs of radio waves. I can also describe "frequency" as the number of these waves, traveling at the speed of light, that will pass a given point in a second.

But for the longer cycles I have no explanation, no proof of their existence. All I can do is present for his consideration, and yours, the *probability* that our environment is pervaded by longer waves—perhaps of a similar basic nature as the radio waves—that, like their faster and smaller "brothers," cannot be seen, smelled, heard, or consciously felt. The crests of these longer waves, if they exist, might come at daily, weekly, monthly, even yearly intervals instead of thousandths of a second. And if they are similar to radio waves, their physical length will have to be measured in miles or even light-years instead of in meters.

No instrument of crystal, transistors, and wire, with dials and gauges, has yet been devised with sensitivity sufficient to detect

and record these ultralong waves. We cannot prove their existence, we do not know their cause or nature, and we cannot pinpoint or even guess their points of origin. In the scientific sense they have not been reproduced or demonstrated in a laboratory and thus they are not recognized by scientific men of good will. And yet the circumstantial evidence that they exist is overwhelming, and we need only call Professor Brown's oysters and potatoes to the witness box to shake the unbending minds of dogmatic science.

If instruments cannot, as yet, detect these forces, how do we know that they exist? Because human beings, plants, and animals are apparently sensitive to them. We judge that they are sensitive to these forces because, *in the mass*, their behavior fluctuates in a way that could not be chance any more than the behavior of our alternating red and black playing cards.

Some will argue that these various events that occur in cycles behave as they do because of inbuilt reasons. They say that the cycles are dynamic or perhaps feedback. But they remain mute when asked to explain how Atlantic salmon, Canadian lynx, Indian rainfall, and Parisian ozone could *independently* and internally all possess what appears to be the same cycle. There is no thermostat-furnace relationship here by any possible stretch of the imagination.

Power to Change the World

We have circled around our evidence and it remains an enigma. But if these regularities, or at least some of them, derive their rhythm from outside forces, and if these forces obey laws that man can discover and learn, our powers of prediction can change our world.

The implications within this possibility cannot be reviewed too often—for we will be able to forecast, with some accuracy, everything that is affected by these forces. Meteorologists, farmers, and sportsmen have been mentioned earlier, but many others who would benefit from the solution to our great cycle mystery come to mind. Bankers would know the probable increase and decrease of

interest rates and general business activity. Manufacturers would be able to compute the probable increase and decrease in the demand for their products, adjust their production schedules, and avoid excessive inventories. The real-estate gentry would have homes ready for occupancy when needed and avoid the costly construction of unwanted floor space. Investors would know, if they paused to take heed, when the prices of stocks and commodities were about to increase and when they were due to decline. Governments would know in advance when they were approaching a period of international tension and would be able to take suitable steps for appropriate defense. There is no phase of human activity that could not benefit from increased knowledge of the future.

Obviously if these forces do exist, and if they have influenced human affairs in the past, any theory of human activity that fails to take these forces into account is deficient. History, economics, philosophy, and every other area touched by man would need to be reevaluated. As one sociologist suggested, even sociology might become a science.

Circumstantial though it may be, our evidence that such forces do exist refuses to be swept into a closet. Pattern does exist, and something must act to create it, for in the absence of order the natural state of things is disorder. Witness a handful of iron filings thrown casually on the top of your desk. If the filings should fall into a pattern similar to that in Figure 6, you know that there must be a magnet hidden under the desk top.

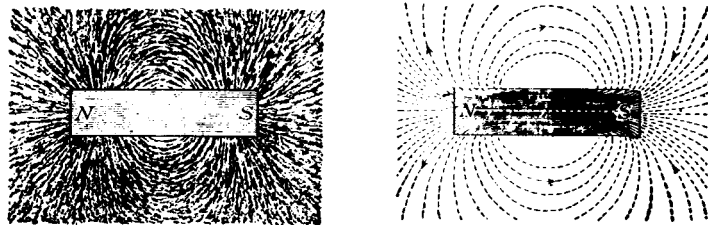


Fig. 6. Lines of Force of a Bar Magnet

Even if you were an aboriginal savage who had never heard of magnets, you would know that *something* is at work to convert into order that which otherwise would be mere chance distribution.

The Consequences of Predictability

Hopefully this has opened new vistas in your concept of cycles. Perhaps the possibility that man will eventually be able to predict the future quickens your pulse. On the other hand, you may have grave misgivings. The late Frederick H. Ecker, former Chairman of the Board of the Metropolitan Life Insurance Company, once spoke out on this point.

Mr. Ecker had been a guest at a luncheon given for me by Robert Struthers, who at that time was a senior partner of Wood, Struthers and Company, investment bankers. At the luncheon, naturally, I talked about cycles.

After the luncheon Mr. Ecker said to Mr. Struthers (as nearly as I can remember his words, repeated to me later by Mr. Struthers), "It's all right to play with this cycle business if you are sure there is nothing to it. But if you ever come to believe that this fellow Dewey has something, drop it like a hot potato. There would be nothing worse for the human race than to be able to know the future."

Probably Mr. Ecker meant that *complete* knowledge of the future would be bad for man. If so, I agree with him.

Suppose you had complete knowledge of your future. You would know everything that was going to happen from now to the end of your time in the world. Among other things you would know, if it were the case, that tomorrow afternoon you were going to be involved in an automobile accident which would kill you. Naturally, knowing the result of your forthcoming tragedy, you would not ride in an automobile tomorrow.

Now this would have many consequences. Your wife would not eventually marry the man from Peoria because she would not be a widow. Your assistant would not get that promotion because you would still be alive. Lacking the promotion, he would quit and

move to Rochester, which he would not have done if you had died. He would have a child he would not otherwise have had. So would you. And so on. In time the cumulative sequence of events would change the whole course of history.

If you possessed this foreknowledge (unless you have more restraint than most of us), I am afraid you would exercise your powers for your own benefit, no matter how much it upset the plan and pattern of the universe.

But the study of cycles *can never give complete foreknowledge*. There will always be accidental variations and noncyclic factors that will enter into every situation, no matter how much we know about cycles.

When the caveman learned that winter and summer alternated with regularity he took a major stride forward in learning how to adjust to his environment. Thereafter in warm times of plenty he could lay up food and fuel for the cold times of want.

Is it too much to hope that a million years later we can learn and make use of cycles similar to our caveman's simple cycle of the year—but with other and more complex wavelengths?