“In the education of tomorrow, knowledge will be presented as tentative, as ‘subject to change without notice,’ and with it there will be taught a method for revising it and for adjusting easily to its revision.”

HEA CLITUS THE GREEK cast a long shadow before him. He contended that one cannot step in the same river twice.

The Greek was going beyond the assertion that no two things are exactly alike to the assertion that no one thing is ever twice the same, that reality is to be regarded as a process. And we might enlarge his contention by pointing out that one may not step in the same river twice, not only because the river flows and changes, but also because the one who steps into it changes too, and is never at any two moments identical.

Heraclitus was over two thousand years ahead of his time. The notion which he so aptly expressed has about it a distinctly modern flavor. It is one which Einstein might heartily endorse. It is the basic notion of science, and science as we know it is not as old as Heraclitus — far from it.

* Wendell Johnson, a psychologist and speech pathologist, taught at the State University of Iowa and had a legendary reputation as a teacher. Reprinted from his book People in Quandaries: The Semantics of Personal Adjustment, originally published in 1946 by Harper & Brothers and reprinted by the International Society for General Semantics, now available from IGS.
What Heraclitus expressed in his delightful metaphor represents also the basic notion of general semantics. Upon the foundation of the process-character view of reality the whole structure of general semantics has been erected. It is a general statement of the implications of that view, implications concerning the crucial character of reality, concerning man’s possibilities of knowing about it, concerning man’s resources for adjusting to it.

In this sense, science and general semantics are as old — and as new — as Heraclitus. It is in our own day that the Greek would have found his most congenial companions, for what he contended was long disregarded. The culture in which he lived, and which has come down to us through the centuries, embodied and still embodies a strikingly different point of view. The orientation of science, of general semantics — of Heraclitus — is not traditional. It represents rather a major break with tradition in the broadest sense. For this reason it will be most instructive to contrast briefly and in highlights these two great tendencies, the one traditional and still quite dominant, the other new but very powerful indeed. Against the background provided by the conflict between these tendencies, the old and the new, we may gain a richer appreciation of general semantics and of the problems to which it is relevant.

**Different All the Time**

No other fact so unrelentingly shapes and reshapes our lives as this: that reality, in the broadest sense, continually changes, like the river of Heraclitus — and in recent years the river of Heraclitus appears to have been rising. The currents are faster, the eddies more turbulent, and the stream is overflowing its banks more and more each day. What we once thought of as safe ground has been abandoned to the flood. The dikes of civilization are watched with anxious eyes.

But change, however all-pervading and rapid, need not be terrifying. It does not terrify the physicist, it fascinates him. And change in the lives of nations, groups, and individuals does not terrify the social scientist; it merely determines the lines of his investigation. Change is terrifying only to those who do not expect it, only to those who, in planning their lives, leave it out of account.

But in large measure, unfortunately, we have been and still are taught to leave it out of account. Change has been suspect and has been resisted throughout the history of the race. It has been customary for fathers to pass on to their sons the creeds and customs which their own fathers had passed on to them. Ancestors have been worshiped and the Old Man has been honored from time immemorial. Education has been chiefly a matter of compelling the child to
conform to the ways of his elders. The student has been taught answers, not questions. At least, when questions have been taught, the answers have been given in the back of the book. In the main, knowledge has been given the student, but not a method for adding to it or revising it — except the method of authority, of going to the book, of asking the Old Man. The chief aim of education has been to make of the child another Old Man, to pour the new wines of possibility into the old bottles of tradition.

Generalizations, those great symbolic nets in which men try to capture the eagles of time, have been wrecked, one after the other, by the creatures they were designed to snare.

Nevertheless, one cannot step in the same river twice. Physicists, chemists, geologists and all others who scrutinize physical phenomena, anthropologists, sociologists, psychologists and all others who study men, report that what they find are processes, growth and decay, energy transformations, social changes, etc. No event is ever exactly repeated. The great scientific advances since Galileo, and particularly during the last fifty years, have made more and more obvious the process character of reality. Generalizations, those great symbolic nets in which men try to capture the eagles of time, have been wrecked, one after the other, by the creatures they were designed to snare. Aristotle and Euclid and Newton and the other Old Men of the school books have been challenged, to their loss, by modern mathematicians and scientists, by Einstein and Korzybski and Russell and the other new-day students of change and process.

If the momentous work of men such as these continues to gain influence, we may assume that in the schoolbooks of tomorrow there will be questions for which there will be no answers in the back pages. In the education of tomorrow, knowledge will be presented as tentative, as “subject to change without notice,” and with it there will be taught a method for revising it and for adjusting easily to its revision. The student will be taught not only how to “make up his mind” but also how to change it easily and effectively. It will be the aim of education to make the child different from the Old Man out of recognition of the fact that he is different and that he must live in a world that is “different all the time.”

For once we grasp clearly what has been “known” for centuries and what is, in fact, the central theme of modern science, that no two things are identical and that no one thing is ever twice the same, that everywhere is change, flux, process, we understand that we must live in a world of differences. We understand that what we see as a difference between the boy and the man represents
a process that has been going on ever since the man was a boy. The effort of the man to remain a boy we recognize as maladjustment, just as we recognize as cultural maladjustment the effort of a society to function in 1946 as it did in 1900 — or in 1945.

Change and Difference

As we have said, this basic notion of process differences occupies a fundamental place in the system of general semantics, and it has extremely far-reaching implications, as we shall see. These implications suggest certain principles of adequate human behavior, principles that are different in many respects from those to which we are accustomed by virtue of our formal training and by virtue of the subtle and powerful influences of our traditions and of our general culture. Indeed, this notion of the process character of reality underlies and generates nothing less than a new kind of civilization.

For it has been the tradition of our race that similarities have been heeded and respected more than differences. Men have cherished sweeping generalizations: you can’t change human nature; like father, like son; the law of “supply” and “demand”; you get just about what you pay for, etc. Exceptions to the rule have been disposed of by the deft maneuver of proclaiming that they “prove” it. There is no intention here to assert that generalizations are useless or “bad”; indeed, throughout this book [People in Quandaries] we shall be concerned largely with the principles of adequate generalization. Our purpose is rather to focus attention upon the traditional tendency to adopt general rules, beliefs, creeds, theories, without thoroughly questioning their validity, and to retain them long after they have been shown to be meaningless, false, or at least questionable. On the whole, once we have adopted a belief, we give particular attention to cases that seem to support it, we distort other cases in order to make them seem to support it, and we ignore or belittle other cases. We feel deeply that somehow it is a sign of weakness to “change our minds.”

Now, a generalization is a statement that asserts that different things are somehow similar, or even identical, and so are to be reacted to or treated alike, or nearly so. Thus not only do we say that all patients who exhibit such and such symptoms are alike in that they have appendicitis, but we also go on to remove the appendixes of all of them. Certain religious sects not only hold that all babies are born “impure” or “in sin,” etc., but also proceed to submerge them all in water, or sprinkle them with it, or in some fashion baptize them, all of them. In some countries not only are all persons with certain pedigrees classified together as Negroes, but they are also all deprived of various privileges and rights. The fact that not all appendicitis patients nor all babies nor all Ne-
groes are alike, even though we say they are, is something that we do not seem able to take into account very easily. The similarities, however slight, impress us much more than do the differences, however great, once we have stressed the similarities by naming them and by generalizing in terms of the name we have given them.

It is not that we are unacquainted with this fact. On the contrary, we are thoroughly familiar with our tendency, as individuals and as organized groups, to orient ourselves on the basis of similarities, even supposed identities, to a much greater degree than on the basis of differences. That is, we are familiar with our tendency to treat the disease rather than the patient, to teach “the child” rather than Johnny, to speak of falling in love rather than fallings in loves. And we are well acquainted with the strong inclination most of us have to cling to our generalizations, to defend our beliefs, to resent criticism of them, and to distrust or laugh at outlanders who have different views and customs. We seem to dread inconsistency. Professor Edward L. Thorndike, eminent psychologist, once began an address before a national convention of an educational association with the remark that he was going to say something that he had heard no one else say to that association during the twenty-five years he had been attending its annual meetings. “I am going to say,” Professor Thorndike announced, “that I have been wrong.”

“And This, Too, Shall Pass”

This tendency to disclaim error, to strive for consistency, to preserve and defend a generalization once adopted, is, of course, merely one aspect of the tendency to disregard differences. For it is precisely by taking due account of differences that one modifies, sometimes radically, one’s established beliefs. We “change our minds,” to some degree, exactly by giving thought to such observations as that a quite healthy appendix is sometimes removed from an “appendicitis” patient, or that some of the unemployed turn out to be extremely competent workers when provided with jobs, or that certain expensive blankets don’t wear as well as other low-priced ones, etc. It is simply by ignoring these cases that are different or exceptional that we retain the views we held before we encountered them. Once we begin to look for differences instead of similarities, it is practically impossible to retain intact, or at all, our generalizations, beliefs, assumptions, etc. It is almost impossible, that is, not to get new ideas. For the habit of asking, “How do these things differ?” or “How might this be different?” is one of the basic techniques of originality or creativeness.

And it is just such a habit that is required for optimal adjustment to a reality of process, change, flux, with its consequent incessantly occurring differences.
If you cannot step in the same river twice, it is folly to try. If love on Tuesday is not the same as love on Monday — and it never is the same — the consequences of expecting it to be the same range from mild disappointment to suicide. If one man’s meat is another man’s poison, the “cook” who generalizes too readily is a public menace. Insofar as Jones at age twenty-five retains the attitudes and behavior of Jones at age five, he is likely to be regarded as an ass, a poor sport, or a sufferer of some kind of “mental” disease. Infantilism, the failure to grow up, to change one’s “mind,” one’s behavior, sufficiently with age, appears, indeed, to be in varying degrees an almost universal form of maladjustment in our civilization, in which similarities are respected more than differences and change is resisted accordingly. We resist the change from childishness to maturity, from one stage of social development to the next. We remain infantile, just as we remain culturally retarded. We pine for the golden age of the past, deplore the new generation, and fear for the “collapse of civilization.” It is an old pattern, and it is not to be thoughtlessly taken for granted. It is not “human nature,” it is only a cultural heritage.

In our society it is considered complimentary, indeed, in greeting a long-absent friend, to tell him that he “has not changed a bit,” that he “looks just the same as ever.” “A bird in the hand is worth two in the bush,” “Don’t rock the boat,” and many other folk maxims reflect this basic conservatism and aversion to change. The doggedness with which some men will resist change has been strikingly exhibited in recent years by the “dust bowl” farmers who refused to be moved, at government expense, to more fertile lands. They illustrate rather literally what Hayakawa has referred to as the underlying furtiveness with which we move into our more stately mansions, disturbed by an uneasy feeling that we have lost our homes.

Abraham Lincoln played dramatically upon this basic and traditional distrust of change in an address which he delivered in 1859, two years before the outbreak of the American Civil War. Speaking at a time of ominous conflict and unrest, and in an effort, or so it would seem, to instill confidence and hope in the people — and, no doubt, in himself as well — he recounted the story of the Chinese emperor who commanded his wisest philosopher to prepare for him a statement that might be made appropriately on any occasion. The philosopher prepared for his emperor these words: “And this, too, shall pass away.” But in citing this, Lincoln spoke of it not with full endorsement — “And yet, let us hope, it is not quite true.” He viewed it, if one does not misjudge him, as a sentiment contrary to the basic feelings of “right-minded” men. It was a sentiment against which he spoke to the friends and countrymen who looked to him for wise guidance. And in so doing, Lincoln aligned himself with historic forces. For the story of man’s eventful trek down through the ages has been in the main
a story of man’s doggedly resistant retreat before the relentless avalanche of continuous transformation. Man’s astonishing capacity for struggling against the inevitable is one of his most inspiring, but tragic, qualities. But again it must be emphasized that in this struggle, in this shaking of fists in the face of change, men do not exhibit “human nature”; rather, they do the bidding of the Old Man, they behave as they have been taught, they merely carry on an old tradition.

The Difference Science Makes

And of this old tradition itself, it can surely be said, in the words of the Chinese wise man, “This, too, shall pass away.” It shall pass, perhaps, much sooner than we think. For the river of Heraclitus is rising and already fills the lowlands. It is rising ever faster as we watch it. Nor is this to be taken for granted. There is a reason, and for somewhat dramatic purposes we may look for this reason in the story of a lively little man who lived not very long ago in Italy. Because of him the world is much different now from what it used to be.

In Italy, in Pisa, on the fourteenth of February, in 1564, only 382 years ago, there was born, to a not very well-to-do nobleman of Florence, a son. His name was Galileo Galilei, but we usually speak of him simply as Galileo. We are told that at the age of seventeen he entered the University of Pisa as a student of medicine and of the philosophy of Aristotle. The Old Man of our culture, above all other Old Men, was Aristotle. It was he who built the dikes, so to speak, of our civilization. And it was Galileo who made the first gravely serious hole in those dikes. As we shall see, he made it with a cannon ball! And the venerable followers of Aristotle, including the Old Men of the church, punished him severely for it. But there it was, that hole he had drilled in the dikes of Aristotelian civilization; and punishment or no punishment, the hole grew, until now the dikes, although they had been well constructed indeed, and seem yet in many places to be sound as ever, are crumbling quite definitely — and the river of Heraclitus is on the rampage.

We shall come back to the cannon ball in a moment. As we have said, Galileo entered the University of Pisa as a young man of seventeen, and he was not long in creating most unusual distress by questioning the dogmatic statements of his instructors. From many points of view, it may be stated that that was the beginning of the decline of the Aristotelian, prescientific civilization. For with Galileo, in a generally true sense, something new came into the world, and the world has never been the same since, nor can one imagine how it might ever be the same again.
What was this strange new thing which Galileo gave to mankind? It was what we have come to call, so glibly, by the name science. It was a point of view, a general method, a rather intangible sort of thing, which most men even today do not yet understand. They feel its effects, certainly; they use its products, they live in new and strange semantic environments which it has created; but to most persons science is essentially a vague mystery, and to many it is still a word that arouses distrust. Galileo is still remembered as a heretic!

It was scarcely more than three hundred years ago when Galileo climbed to the top of the leaning tower of Pisa and performed one of the first deliberately executed scientific experiments ...

Science, the policy of subjecting The Word to the test of experience and of revising it accordingly, no matter how old The Word may be or who defends it, this certainly is new in the world. For it was scarcely more than three hundred years ago when Galileo climbed to the top of the leaning tower of Pisa and performed one of the first deliberately executed scientific experiments, in which he demonstrated that a heavy cannon ball drops no faster than a light one. He did, indeed, blast a hole in the dikes of civilization. He showed what could be done with cannon balls, what really could be done. He shook the world as it had never been shaken before. What he demonstrated was not so much a fact about falling weights, a fact against which Aristotle had contended, as a new problem-solving method based not on the authority of age and prestige, but rather on the authority of observation and experiment. He started the Old Man tottering on his throne. And although the Old Man has clung, these three centuries, to his perilous pedestal, he has never regained his former poise.

It is true that in most matters we still feel our deepest respect for the authority of age and precedence, the authority of venerated names and of robed and besymboled titles — but it has been hardly more than three hundred years since Galileo. In the history of the race, after all, three hundred years is but a small part of the morning. In those three short centuries the face of the earth has been in no small measure transformed, and the transformation gains rather than loses momentum. The Old Man is still dominant in our world, but it is a world that becomes increasingly strange to him and distrustful of him. It is the authority of science that is already shaping the future of civilization, in ways which even we in our time may understand and learn to cherish, and to which our children will probably adapt easily and no doubt with enthusiasm.

An old culture, a prescientific civilization, is passing, and wisdom does not lie so much in assuming a posture of regret as it does in keen participation in the
exhilarating change to a civilization of science. Those prophets of despair who
proclaim that all civilization is dying and that we are returning to the Dark Ages
mistake the propelling force of destiny for the vigor of a death agony. It is not
that we are going out by the same door wherein we entered. This is not, in the
jargon of the movie-goer, where we came in. The show is changing, but history
is not repeating itself.

There are differences between the old and the new tendencies, differences
which have exciting implications. The fundamentally distinguishing feature of
the culture now deteriorating lay in the fact that it was based upon a static
notion of reality and involved, therefore, a resistance to change, an overvalua-
tion of similarities, a profound respect for established generalizations, for con-
vention and tradition, and for the authority of age and precedence — the au-
thority of the Old Man. In all that, it was sharply different from the scientific
culture now emerging, which is based upon a process notion of reality and
involves, accordingly, a strong tendency toward change, a high valuation of
differences, a critical attitude toward established generalizations, a conviction
that traditions are to be outgrown, and a profound respect for the authority of
systematic observation and evaluated experience — the authority of science as
method.

What is particularly to be underlined in all this is the notion of the process
character of reality, a notion that is peculiarly basic in the scientific view of the
world and of man. The great laws of science, themselves held subject at all
times to revision, are laws concerning the continuous processes of reality —
what Max Born has so aptly called the “restless universe.” The ultimate pur-
pose of science is not merely to study these processes, certainly not to resist
them, but rather to predict and thus to control them, in order that men may stay
attuned to the great flux of nature by which they are surrounded and of which
they themselves are part. A scientific way of life rests squarely on a clear recog-
nition of all this, a constant awareness of change, flux, process; a frank rejec-
tion of the belief that reality is basically static, that there is nothing new under
the sun, that history merely repeats itself.

As special laboratory techniques, as technology, science has enabled us to
remake, in large measure, the material world in which we live. But this in itself,
combined with a prescientific “philosophy,” can well make for stark tragedy —
as we in our time need hardly be reminded. It is science as a general method of
orientation, a way of life, no less, that promises the means whereby we may
learn to live, with grace and without rancor, in the world with which we have,
by our own perilous ingenuity, surrounded ourselves.
The Basis of General Semantics

General semantics may be regarded as a systematic attempt to formulate the general method of science in such a way that it might be applied not only in a few restricted areas of human experience, but generally in daily life. It is concerned with science not as specialized laboratory techniques, not science as it depends upon highly refined precision apparatus, not science in the form of esoteric theories concerning the moons of Jupiter or the chemical composition of spot removers, not science as compilations of facts and statistics with regard to everything from wind velocities to petroleum — not science as technology — but science as a general method, as a basic orientation, as a generalized way of solving problems — and with due regard for the language of science; it is science in such a sense with which general semantics is concerned.

What the men of science have learned to do with such unprecedented effectiveness in their technical laboratories, general semantics would prepare all men to do as well as they may from moment to moment in their daily lives ...

It belongs, thus, in the tradition of Galileo and Newton and Maxwell, of Darwin and Pasteur and Pavlov, of Peirce and Russell and Einstein — of Heraclitus — the tradition of breaking traditions as a changing reality and a changing humanity require. What the men of science have learned to do with such unprecedented effectiveness in their technical laboratories, general semantics would prepare all men to do as well as they may from moment to moment in their daily lives, and from day to day in their handling of the social problems by which they are all affected.

Since general semantics has been distilled from science, it will be to our advantage to have a look at science — at those characteristics of it that are important in general semantics. Then we may examine more intelligently the basic principles and procedures of general semantics, and then, too, we may more effectively apply them.