Korzybski's General Semantics Principles and Practices

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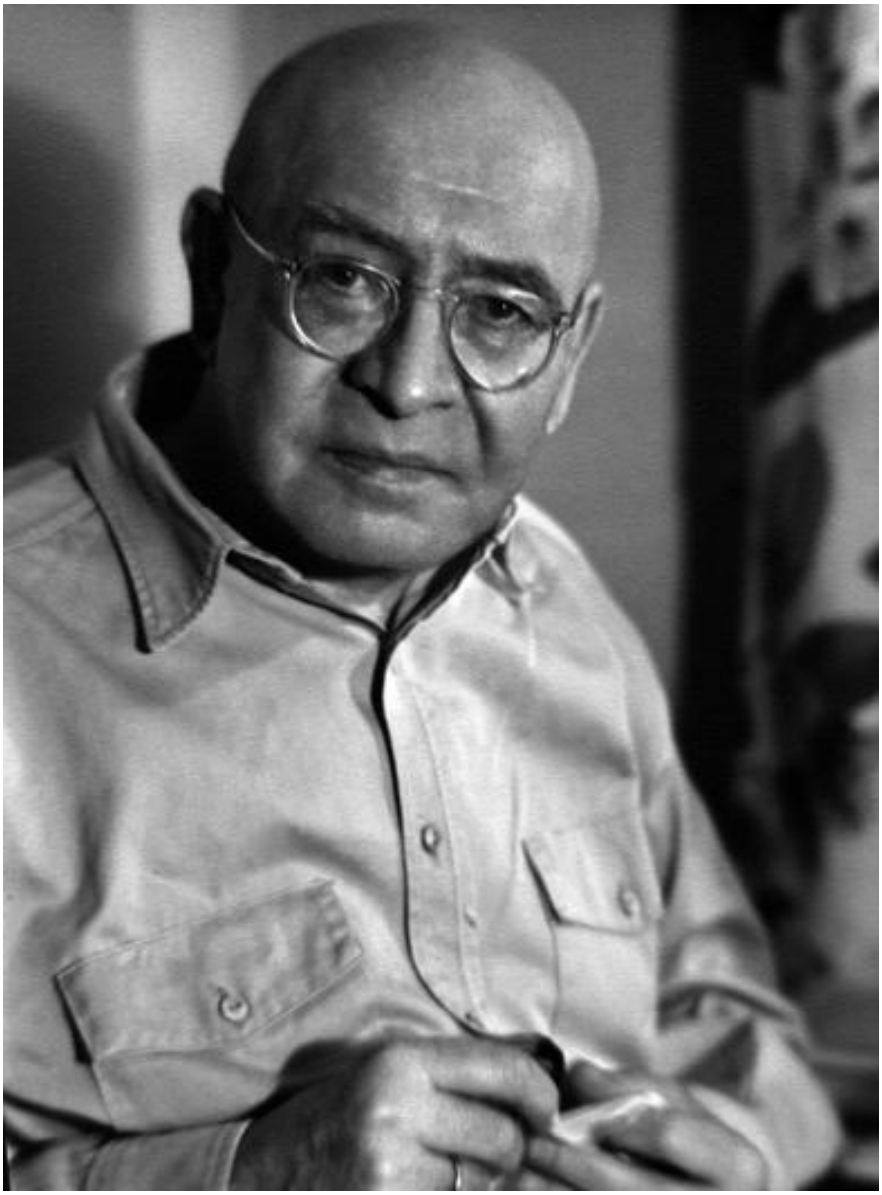

Table of Contents

Book One: Principles and Practices

Book Two: Korzybski' Territory (Pending)

Preface

Alfred Korzybski developed a unique, comprehensive, and powerful methodology, general semantics, for enhancing perception, evaluation and achieving objectives. This is a handbook focused on his principles and practices. My objective is to provide you with tools, the understanding and practices of general semantics, needed to meet the challenges of this century. This is the focus of Book I

My second task was to complete a review, a timeline survey, of Korzybski's works, starting with his 1921 *Manhood of Humanity*, the 1933 and subsequent editions of *Science and Sanity*, and lectures and papers, most of which were published in Alfred *Korzybski: Collected Writings* 1920 – 1950. All of these books are available from the Institute of General Semantics (here). This will be found in Book II.

My interest in Korzybski is the results of professional work. Early in my career I began to work with the problem of developing effective leaders, and through them projects and organizations, in government, higher education and business, to successfully engage the problems of an increasingly complex society.

Fortunately, I was invited to participate in an extended seminar series under the University of Colorado, in Denver, with a group of urban professionals – a model that integrated learning and action. The objectives of this series was, first, the nature of the problems needed for social and economic development in cities. The second, and determining, issue, was the lack of effectiveness of programs. In short, we needed a better theoretical framework and a better system of education to prepare the men and women needed to affect innovative solutions.

At this time, I met a woman, Leanore Goodenow, who had attended one of Korzybski's Second Congress in Denver and she gifted me with her copy of *Science and Sanity*. I am eternally in her debt.

Over the years I studied and applied Korzybski's general semantics. In 2007 I summarized my study of and research into his life and work as *Alfred Korzybski: Time Binder*. In that book I presented, first, a brief biography of Korzybski and the context of his work, and second, a summary of all his printed works and audio collections then available. That manuscript is available through the Transition Centre website at no cost (link).

Following Bruce Kodish's excellent *Korzybski: A Biography* (2011), I began to focus on a more practical text. This material was posted on the mentioned blog site, completion of this manuscript delayed due to other pressing projects. Increasingly pressing conditions of our time motivate its publication.

My approach to Korzybski is due to a personal style. You could call me a purest, perhaps "orthodox." When I study science and engineering, I treat theory and method as axiomatic. It's not a matter of "interpretation," but of application. There is a very solid foundation of literature to his work and extensive experiential, if not always experimental, content. Decades of using Korzybski's material convince me that it works. Not that it can't be improved, as he made clear, as is the case of all sciences, but because I find that it works. Use of Korzybski's system has given me greater clarity, a keen understanding of what is

going on in my immediate environment, a good understanding of human nature, and effectiveness in my work. I've explored a lot of work about enhancement of human potential and use some of these extensively. General semantics, however, continues to provide the foundation for interpreting those methods and putting them into practice.

Granted, Korzybski's writings are daunting. Several works have been developed, including by him and close associates, to make it clearer. His seminars, due necessarily to time constraints, tend to be more focused, albeit delivered over the course of days. I found the need for a practical text. Clearly there is much I have not fathomed about Korzybski, and much is always learned as I apply his system. The limits are entirely my own.

About this Book

As noted, I intend to get directly to Korzybski's principles and practices. This represents a narrative outline of the key tools of general semantics, the first chapter.

Following that is the theoretical framework for his work, an expansion of what is implicit in the principles and practices. This starts with a chapter on neurophysiology and that subject defines the structure and function of the human nervous system, the qualities that make us a unique species. That uniqueness is, of course, founded in our capacity for language and neurolinguistics, which is Korzybski's main task.

This takes us to Korzybski's practices, and this begins with the foundational principle of abstraction. It is about how we process our experiences. And it is about how we may lose contact with that reality by relying on words to describe words, and then again, until what is left has little relationship to the way we live our daily lives and do our work. This is also the root of sanity, vs, the opposite.

Following are four chapters about the process of abstraction. Another relates how Korzybski distinguished his system from our current way of working with language, one based on antiquated principles, but it nonetheless dominates how we think today, how we think in a way that imperils our survival. That concludes with the psychological condition he called "unsanity." It is from this material that he evolved his *Science and Sanity*.

In conclusion I will discuss how this applies to the work I do and see mandated by the emerging challenges of the twenty-first century. We have reached what has been called a "Far from equilibrium" state. Such was anticipated by Korzybski. Indeed, he inspired much of the work, in systems theory, information and chaos theory and subsequently a variety of expression found in the works of such as Capra and Bohm, two scientists with the social and historical consciousness that Korzybski exemplified.

My focus is on the integration of human knowledge. That subject has, or should, shape, the evolution of digital technology. You will find that Korzybski's work was a catalyst of this line of work.

I will finish with a reflection on how, and as noted this topic has occupied me my entire adult life, I seek to develop an acting agent capable of adequately addressing the transitional and emergent forces that affect our lives in the present time.

Please note that there are some redundancies in these chapters. They were originally posted as individual articles and serve as the text for separate seminars.

Introduction

Alfred Korzybski was born in Poland in 1879. Poland was then part of the Russian Empire. He was a nobleman, a count, with a home in Warsaw and a country estate. He was brought up fluent in four languages. His father, a successful engineer, gave Korzybski the "feel" for rigid expression in mathematics and science. Korzybski was trained as an engineer. Prior to World War I, in addition to managing the family estate, he taught mathematics, physics, French and German.

During World War I Korzybski served as a military intelligence officer for the Czarist army, conducting frontline reconnaissance on horseback. He experienced the horror of war at first hand and carried the effect of injuries the rest of his life: He walked with a limp, with the aid of a cane. As a result of his disabilities, he was dispatched to North America in 1915 where he worked to secure munitions and recruit immigrant Poles to military service. In 1919 he married American miniature portrait artist Mira Edgerly.

Profoundly influenced by the effects of what was then called The Great War, a war that consumed a generation of European manhood, a war in every sense modern and industrial and defined by weapons of mass destruction; Korzybski published his much-acclaimed *Manhood of Humanity* in 1921.

Several important ideas came out of *Manhood of Humanity*. For one, Korzybski caught the great wave of humanistic, pro-peace, progressive thinking that followed the Great War. He, as did others, sketched an idea for a network of highly trained leaders who could guide the world to peace and prosperity, to end war and suffering, and to bring humanity to maturity. He also formulated the idea of "time-binding." Time-binding represents the cumulative wisdom of the human experience over the course of our history. From this great treasury of knowledge, we are free to draw on, and add to, an inexhaustible resource, in science and literature and art, which we may use to pave the way to the realization of human potentiality. He was one of the first, and most dynamic, proponents of interdisciplinary studies.

Manhood of Humanity was just the start of his Korzybski's life work. He was motivated to seek a fundamental improvement in our capacity to use language as a result of his war experience; a language of peace rather than conflict. Over the next several years he sought to bring his understanding of science and mathematics to the task to formulate a science of humanity, oft expressed in terms of human engineering.

Over the next several years Korzybski sought to bring his understanding of science and mathematics to the task of formulating a science of humanity, sometimes expressed in terms of "human engineering." In a very real sense Korzybski was a product of the European Enlightenment and Positivism.

His work also took him to the cutting edge of the new science, of relativity and quantum mechanics, and of a large, related literature, one that he enumerated in the extensive bibliography of *Science and Sanity*. That deep exploration and synthesis gave him a profound understanding of the best knowledge then available. And it appears he read and reread every book listed in his bibliographies, outlining, annotating, and highlighting the

key words that allowed him to "map" the content of page, chapter and book; that allowed him to recall the content represented by those highlights as he flipped through the pages.

He also undertook an extensive study of the then relatively new field of psychoanalysis. Gaining access to one of the great psychiatric teaching hospitals of the day, he studied closely with the distinguished Dr. William Alanson White for two years. In order to understand sanity, which we might define as scientific rationality, he probed deeply into the cause and effect of mental disability. It takes a good mind, he concluded, to be really insane; that is to say, severe mental illness can occur in an organically sound brain. He concluded that the cause of such illness, the profound detachment from reality we call insanity, is due to the way we think, not just an organic ailment. Hence, *Science and Sanity*.

Korzybski was no armchair intellectual. He went out and met people. He made friends. He had long conversations and exchanged extensive correspondence with many of the leading minds of his day. He was very well informed and highly respected.

Korzybski's vast biography suggests another important aspect of general semantics. He clearly understood that we cannot think effectively with isolated fragments of knowledge. He strove to understand and synthesize a more general theory of scientific thinking and align rigorous, mathematical reasoning with the content of allied fields. Buckminster Fuller, another, renowned in his own right, student of general semantics, named such thinkers "comprehensivists." Fuller was himself an archetype of the comprehensivist. Another term is polymath: a person who draws on a wide range of topics to solve a problem.

Korzybski drew from the leading edge of thought in his time. He planned to organize a library of the work of the best and brightest and to add new material to it from minds trained in general semantics. For those so inclined, as you probe Korzybski's work, you might keep the sources he drew from in mind. The students of general semantics who are worthy to carry his work forward will, of necessity, become familiar not only with these sources but also study the relevant literature of the half-century and more since his death to learn the new insights gained.

Korzybski was partial to the scientific method. His ideas are propositions. By that I mean they are statements of principle that we can apply, test, validate or falsify. They can be used as hypotheses. These statements can be, and must be, put to the test. They are empirical statements. By applying and testing, by learning and developing these principles, serious students of human potential could continue to develop the field of general semantics and its applications. Korzybski was the first to say, and was quite insistent about it, that his work was far from finished.

Korzybski had a lot of influence on the development of systems thinking. Bertalanffy acknowledged him as a contributor to general systems thinking. Korzybski understood that an organism could only be understood as part of its environment. He understood that the human nervous system could only be understood as a part of the body engaged with its environment.

Korzybski and Bertalanffy had similar anti-dualist roots. Bertalanffy's thesis was based on a reaction to Descartes. Korzybski extended that line back to Aristotle and called general semantics a non-Aristotelian system. In essence, they both rejected the mechanistic

system that has embedded itself in the way we are taught to think. Bertalanffy's colleague in founding general systems theory, Anatol Rapaport, was a leading figure in the general semantics movement.

Korzybski, in his *Manhood of Humanity*, had proposed an integrated, multidisciplinary, approach to solving the pressing issues of human society as early as 1921. Korzybski was highly influential in a field described as "the integration of human knowledge." He was, in fact, well known in English long before Bertalanffy. In his 1933 *Science and Sanity* Korzybski presented the full range of concepts that have been claimed by general systems theorists.

Korzybski published his magnum opus, *Science and Sanity*, in 1933. In 1938 he established the Institute of General Semantics in Chicago. He spent the remainder of his life writing, speaking, and giving seminars. Several thousand people attended those seminars. During them he would spend several days presenting his principles. Evenings, often late into the night, he held private consultations with his students. The last years of his life were spent in rural Connecticut (pictured) where, surrounded by staff and students, he continued the work of directing the Institute. In 1950 Korzybski died and a new phase in the history of general semantics begin to unfold over the decades, which brings us to the present moment in time.

End Game

Alfred Korzybski died March 1, 1950. The last years of his life were spent in rural Connecticut where he continued the work of directing the Institute, surrounded by staff and students. He was stricken while in conversation with a student the night before: In a real sense he died with his boots on.

The news of his death swept the country and the world. A memorial service was held March 4, 1950, at his home, and the home of the Institute of General Semantics, at Lime Rock, Connecticut. Alfred, as the phrase goes in the community, had coagulated: The vital life-force of the cells he described in his works had ceased. That glow of consciousness that had defined the master mapper was gone. The General Semantics Bulletin Number Three

was a memorial issue. His closest associates continued the Institute in Connecticut, Hayakawa the International Society on the West Coast.

On reflection, the fact that Korzybski was able to establish general semantics as he did in the 30s is a remarkable story. *Science and Sanity* came out the year of the nadir of the Great Depression. That he was able to find funding to open the Institute in 1938 was something short of miraculous. The following year Hitler invaded and devastated his home country, Poland and the next six years were dominated by a global war. At the end of the war, through a period of dramatic social transformation and readjustment, Korzybski had but five years to reestablish his work and attempt to repair the damage of the "semanticists."

Korzybski's influence continued to grow beyond his death. In 1952 there were 4,000 people enrolled in two organizations (east and west coast) with two journals. There were some 100 people teaching general semantics and courses in 25 colleges and universities. Circulation of the International Society of General Semantics journal *Etc.*, peaked in the mid-sixties following Korzybski's recognition by *Saturday Review* (first post) and Hayakawa's best-selling *Language in Thought and Action*, at just over 10,000 subscriptions.

In 1964 *Science and Sanity* was judged by a literary panel one of the most influential books of the previous 25 years. The list of leading thinkers who employed his methods is long.

At that time the Human Potential Movement was in full flower. Aldous Huxley popularized the term "human potentialities" in the early sixties; Korzybski used the term in the 1940s. Humanistic psychology founder and HPM leader Abraham Maslow was a student of general semantics and an Alfred Korzybski Memorial annual lecturer. The irrepressible Counterculture icon Bucky Fuller was another serious student of general semantics and AKM lecturer. Fritz Perls, founder of Gestalt Therapy and HPM great, admired general semantics. The group therapy movement had its roots in Institute board member Dr. George Kelly's founding work with shell-shocked veterans during World War II. Group dynamics founder Kurt Lewin was influenced by and was admired by Korzybski. One of the founders of general systems theory, Anatol Rapoport, was a student of general semantics. Korzybski did much to define the shape of "general systems" thinking during his life. General systems theory and cybernetics were instrumental in founding the computer industry. General systems theory has today evolved into the field of ecosystems, a subject that reinserts humans into the web of life.

Halfway through the Seventies the HPM, following the death of many of its leaders, simply unraveled. Publications declined precipitously. Many of the basic ideas, while absorbed to a large degree by popular culture, had lost the clarity and focus they had enjoyed. The curtain, so to speak, had come down, the show ended. The Seventies was a generation of change in its own right. The Vietnam War came to an end, Civil Rights the law of (if not truly settled upon) the land. The visionary and charismatic King was gone. The radical generation of the Sixties got married, mortgaged, and entered corporate careers. S. I. Hayakawa got elected to the US Senate.

When I first became seriously involved in the study of general semantics, some quarter-century following Korzybski's death, my leading question was: Is this material relevant today? That question was really one of wondering where the movement had gone? Clearly it had lost momentum. The Institute at Lime Rock had closed; Korzybski's closest and most able assistants aging or dead. Subscriptions to publications steadily declined. In those days before the Internet, you had to be willing to work to find information about general semantics.

In 2004 a small group finally succeeded in mending the split between Korzybski's east coast Institute and the west coast Society that Hayakawa founded, a headquarters office was established in Dallas, the Korzybski archive moved there and the Korzybski biography finally published. The Dallas office has subsequently closed and the movement again searching for a foundation.

Much of my work with Korzybski, is a response to what I see as a loss of momentum.

What has happened with the general semantics movement, I must hasten to stress, is not at all unusual. Indeed, it is perfectly consistent with the history of most movements, especially those founded by charismatic geniuses. But as you can guess, yes, I believe general semantics is relevant, increasingly so, and that it needs to be brought more fully into play, and brought fully into synchronicity, with the emerging century. That will take a new leadership and a revival of serious study of Korzybski's work.

General semantics was developed by Korzybski to address pressing problems in his day. How well we address our problems depends on the power of the tools we have at hand and the capacity of men and women well trained in those tools to use them effectively. The relevance of any field of study is the utility of its tools.

Decade by decade there has been significant change; unimaginable forces of change have been unleashed that have and continue to transform our world and our place in it. We need not recite a litany of those changes. Indeed, for many who might read these words, not a few of the defining events of my generation are outside of their living memory – just "history." It is only that these issues have so persistently avoided resolution that we need be reminded of them. As Einstein so famously said, we can't resolve problems with the thinking that created them. In that sense, Korzybski was far ahead of his time. Yes, I do believe Korzybski's time has come. Indeed, I find little else that offers the promise of his system, of general semantics. But before it can be used it must be learned as carefully and thoroughly as any field of science or technology.

General semantics must not only be learned but applied. It is, by definition, a subject designed for application, in a real sense a technology. Remember, Korzybski used the term "engineering." There is no dearth of pressing needs for general semantics. In my own work, designing resilient, adaptive, communities, there are massive issues related to energy, economy and environment. There are a lot of people troubled by these problems but few who have a systematic program to address them.

There are new and emergent technologies that are reshaping our lives as never before. Digital technology augments, or could augment, our intelligence. It also radically transforms the way we relate to each other and the world. Genetic engineering dramatically changes our relationship with the very process of life at the microscopic level;

just at the time that our industrial civilization has transmuted our way of life at the macro-, or planetary level. Again, and I must stress this, we are pressed to create a new leadership for this age, a leadership that has the capacity to see the big picture, to clarify problems to be solved and to organize the solution. We are pressed to develop new forms of social organization, of effectual community. These undertakings will take, as Einstein saw, a new way of thinking, solutions that have not been tried before, and I see general semantics as being the system for creating this new story.

Chapter One: Some Key Tools in General Semantics.

The practical aspect of Korzybski's system consists of three parts:

1. The human nervous system (neurophysiology). We are the product of four billion years of the evolution of life on Earth. As organism became more complex, they developed a nervous system to coordinate function. Eventually a "brain" node developed. The more complex the organisms as nature evolved, the more complex the brain. The emergence of human consciousness is a dramatic leap in evolution.
2. The human brain is defined by consciousness and by the faculty of language. Our brain was made to solve problems, for survival. In order to solve a problem, we must understand it, the conditions that caused it, and through our imagination, solutions. Through language our species has the unique quality of being able to pass down what has been learned from generation to generation – time-binding. Our brains also have the capacity of fantasy, in short, believing things that just aren't true in the world outside of our skins. The bulk of the second part of this book, "Principles and Practices," is devoted to a series of key formulations made by Korzybski about how we use the capacity of our brains.
3. Which brings us to the tools he developed to allow us to achieve clarity, coherence, meaning and purpose. And also, to avoid the pathological effects of our fantasies. I call this a "New Grammar."

My intent in this chapter is to provide an abstract of Neurophysiology and Neurolinguistics. The objective of this chapter is to give you, in brief and workable form, the tools Korzybski developed.

Neurophysiology

The foundation of Korzybski's work is the human nervous system. What distinguishes the human nervous systems is the cerebral cortex, the outer layer of the brain and the seat of human consciousness and language.

Our engagement with the world outside our skins begins with the senses and ends in the cerebral cortex. It is about the process of perception. The question Korzybski asked is whether or not the ideas inside our skull accurately represent the world outside. Science goes to great lengths to ensure that what it says about the world is accurate, and more importantly, that anyone undertaking a scientific investigation will come to the same conclusion. Therefore, there is full agreement between each observer.

The physical world is rigidly restrained by laws, laws which we can readily understand and use. The mental world is not so constrained: the imagination can roam freely, and like the Red Queen, think of many impossible things before breakfast. As a result, we have a vast array of ideologies, theologies, philosophies, and opinions that lack general agreement. They are not intended to be tested, there is no falsification option. These ideas are the source of conflict, not rarely of a lethal nature. Taken far enough, they are what is generally called insanity. We must learn to think within the laws of Nature, and to do that we must understand ourselves as a product of natural evolution.

Neurolinguistics

Korzybski worked to understand how language is formed. He formulated the concept of neurolinguistics in *Science and Sanity* [1]. It is a model of how we experience reality. It's about how we translate experience into words and what we do with those words. Korzybski made a breakthrough in the understanding of language formation with his structural differential. With it he created a physical model of how the brain translates experience into language. In short, like other animals, when we have an experience, the senses flood the brain with information: visual, auditory, touch, smell, taste. In animals the process remains "silent" and they respond by instinct. With humans, we begin to affix labels, words, to the experience. For example, water falling from the sky as "rain." We add a lot of other words from other experiences, memory, of our experience of rain. It can be warm or chilled, gentle or frightening, experienced as pleasure or irritation. There is sometimes sleet or hail. In colder form it is snow. We can curse about it, write poems, sing songs, and talk endlessly about the weather.

The structural differential (my personal model pictured) defines the process of experience and abstraction. It begins with an event that draws our conscious attention. The circle represents the experience. This event occurs at a pre-verbal level. To that experience we add labels, words that we draw out of our memory of previous experiences. The inverted parabola represents our previous experiences. As we experience events more than once, we develop categories, generalizations, and abstractions. The mind naturally generalizes experiences creating new labels for groups (classes) of related things. We organize these experiences into classes or categories. The label is the rectangle. As we form further abstractions, the line of labels/rectangles grows.

Korzybski found that the basic problem with understanding the world outside was the process of abstraction. We abstract not once but again and again and with each abstraction, we lose content. We lose connection with the original experience. We, as the joke has it, begin to say more and more about less and less until we can say almost everything about almost nothing. As they progress, these abstractions become increasingly detached from reality.

Primitive languages are far less abstract. They have different words for every experience. The Eskimos, for example, according to anthropologist Franz Boas, have fifty different words for snow[2]. Modern cultures tend to rely on broader generalizations and use other abstract terms, or modifiers, to refine meaning. With the advent of civilization came more complex, formalized, uses of language, including writing, which have evolved to the current level with expressions such as science and mathematics. The invention of grammar, the alphabet, libraries and scholarship advanced our linguistic capabilities, but they also created some very real problems.

[1] The term "neurolinguistics" has been attributed to Trager, Hecaen and Luria who used the term in the title of a text in the 1940s.
[2] Skiers understand a lot of different types of snow.

The structural differential both describes the process of abstraction and reminds us that we are doing it. Clarity of thought begins with an awareness of abstraction. This is the fundamental axiom of general semantics.

The Greek philosopher Plato believed these highly abstracted ideas were more real than our direct experience of the world through our senses. He separated mind from body (the senses), the observer from the observed. This process was formalized by his student Aristotle who developed a system of deductive logic that is still widely practiced. It works more or less in the form of: if A (first premise) is like B, and B (second premise) is like C, then A is like C. The problem is that the premises don't have to be true. Given Aristotle's influence, Korzybski labeled this "antiquated" form of thinking "Aristotelian" and proposed a non-Aristotelian system in its place that he called general semantics.

The idea of "non-dualism" is often found in theology and metaphysics. Most religious systems are, however, about a world beyond the physical, and a better, spiritual (non-material), life after we die. There is an absolute realm of God-given truth. This is pure abstraction. Medieval Christian scholastics used Aristotle's logic to "prove" the truth of dogma. Theologians, metaphysicians, and philosophers still do. Given that many believers consider scripture to be the literal word of God, for them this works just fine. Outside of theology, over the course of some two millennia, the structure of this form of reason has become deeply ingrained into our very language.

Aristotelian thinking had a strong influence on modern science. We've already noted the effect of Rene Descartes' Platonic thinking. It helped turn our perception of the world, including our own lives, mechanical. It is detached from life. Personal detachment is a scientific moral imperative. This detached attitude has allowed us to plunder the natural world with seeming indifference; and there are, of course, serious consequences. Reductionism, cutting the world into tiny fragments, which are studied in isolation, is also a product of mechanistic science.

Again, I need to emphasize that the advent of relativity and quantum physics forced a shift in perception. This new understanding challenged the Platonic/Cartesian perspective, and this was an important element in Korzybski's work: The universe becomes more organic, connected, and interdependent. The new science demonstrated that the observer is intimately embedded in the world he or she is observing. Korzybski clearly demonstrated that fact in his model of perception and language.

Key Principles

There are several key terms that need an initial definition. I will give those in very brief form in this chapter and develop them more fully in the next section.

Abstraction

Confronted with an event, we become aware of a few of its characteristics that are stored in our memory (see "pencil" in Allness, below). As we grow from infancy to maturity and develop our capacity for language and critical evaluation, we naturally categorize experiences into classes that share certain characteristics, for example: Animal, vegetable, mineral. The game of 21 questions nicely illustrates this process.

As we gain experience, and this continues through all phases of our active mental life, we both place experiences into already defined categories, such as: Animal: dog or cat, breed; and create new categories where we don't find the existing ones convenient. Each of these classes, and there is an exacting logical science for classification, is a level of abstraction. As the class of objects grows, new subclasses, more abstract formulations, occur. Carried far enough and we have, as in the field of natural history, the story of life on this planet and an array of scientific subjects, an encyclopedia of species, and specializations that fill a catalog.

The problem Korzybski identified with abstractions is that the further along the chain you go the greater the distance you get from the original, first order, experience. Reality loses its concreteness and concreteness is the foundation of a sane, rational mind. One major problem with this process is that we tend to think that the word represents the thing itself. Ultimately you get into philosophical debates about whether categories, or forms, have independent existence and thus the mind-body split, the phenomena Korzybski called[3] "Aristotelianism." Aristotelianism, he concluded, was one of the major pathologies of modern life. General semantics is largely about gaining a consciousness of abstraction, about a non-Aristotelian orientation to life and thus restoring a healthy state of mind. Related to this pathology are allness, identification and elementalism.

Allness

Whatever we say we cannot say everything about it. Korzybski coined his hallmark phrase, "The map is not the territory," to illustrate that what we say about an experience is but a partial representation of it. Anyone who uses a map knows that regardless of how detailed, it still leaves out a lot of information. GIS map overlays can provide awesome detail and online map services can provide street views but when you are standing on a spot on that map, or driving down the road seeking a destination, there is just a whole lot more to the story.

Allness refers to the knack of thinking you know more about a subject than you do or should: "I know all about X." We, of course, never know everything about anything. You can spend a lifetime continually learning about almost any subject. We can't become experts in every subject, but it is necessary to be informed, to get beyond the surface of things, to be more than an opinionated bore. True wisdom is understanding that there is yet much we don't know.

Korzybski liked to illustrate this problem with a common pencil. Pick one up and look closely at it. Spend a full minute with it. Unless you've done that before (and even if you have) you will see things you never noticed before.

A pencil is obviously composed of a number of parts: lead (it's really a graphite composite), wood (or other materials), perhaps eraser and the ferrule that holds the eraser, paint, lettering, etc. You will often notice a number of the pencil, usually 2, 2/12 or 3. Some will have H or HB or other codes printed on them. This describes the hardness of the pencil, that is, how dark or light it will write.

[3] Korzybski created his own lexicon of terms that must be understood to make general semantics a practical subject.

Most of these are school or office pencils that come in boxes at market, department and office supply stores. There are pencils designed for all sorts of tasks. In the art section or store there are a lot of different pencils. There are also mechanical pencils. There are even pencils without "lead."

Going deeper there is the history of the pencil, design, manufacturing, materials, chemistry, and engineering. The naturalist Henry David Thoreau was a pencil maker, and his improved design was a popular item in Boston stationary stores. Korzybski liked to point out that there are microscopic and sub-microscopic qualities to every object. Every pencil is essentially unique. We will get to this idea below, but there is always an "etc." in anything we describe[4].

Identification

A Korzybskian formulation closely related to allness is identification, which is automatically and compulsively reacting to a new experience as if it were like earlier similar experiences. Every experience is unique and must be considered on its own terms, as it is, and not as some abstract symbolic response. A major cause of mental distress is the automatic response to an experience, that possibly caused pain or anxiety at an earlier time, as "Oh no, not again!" We often hear Einstein's definition of insanity: "Doing the same thing over and over again and expecting different results."

The inability to differentiate experiences leaves us with a pre-programmed response to them. That we fail once, or even a number of times, to solve a problem does not mean that we cannot solve the problem; its more a matter of being sure we are solving the right problem and asking the right question. Failing to strive to do so ensures failure and this is non-survivable. Persistence, determination, and resilience are admirable human qualities. Korzybski's non-identification represents a keen understanding that "this is not that," and thus that each event must be addressed in its own terms.

Elementalism

Elementalism represents the process of breaking the world down into smaller and smaller parts until the parts no longer have an interrelationship. This is reductionism.

The world we live in is a whole, organic system. Elementalism is the process of breaking the world down into smaller and smaller parts until the parts no longer have an interrelationship. This can be a powerful tool for problem solving but it is a two-edged sword. It produces linear thinking and dualism. Science itself was slipping into this habit of mechanistic thinking until relativity and quantum mechanics begin putting things back together. The non-elementalism of general semantics puts the pieces back together and gives us a more comprehensive and more realistic framework for understanding life. Korzybski's general semantics was, in fact, a precursor and arguably largely defined the field of general systems theory that profoundly altered our understanding of and control over life[5].

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[4] Henry Petroski wrote a 400 (plus) page book on *The Pencil*.

[5] Ecosystem science was derived from general systems theory and a description of this field can be found at my blog post: http://transitioncentre.blogspot.com/2013/10/systems-ecology.html

Semantic Reaction

Semantic Reaction: Words have emotional impact. The human nervous system includes the lower brains, which are designed to respond by instinct to flight or fight. We must, Korzybski insisted, learn to "count to ten" when we feel emotional impact. This allows us to reset our higher mental functionality.

As stated, the human nervous system and language represent a highly integrated system. Words have an emotional effect on us. They can, according to how they are used, evoke many very strong emotions. We can be moved to tears or laughter, love or hatred by words and symbols. In Korzybski's words, a semantic reaction is "the psycho-logical reaction of a given individual to words and language and other symbols and events in connection with their meanings, and the psycho-logical reactions, which become meanings and relational configurations the moment the given individual begins to analyze them or somebody else does that for him."

Korzybski concluded that formal methods of treating language – linguistics, semantics, logic, etc. – do little to improve evaluation and reduce the negative effects of words. We have to learn, as the old wisdom tells us, to pause, to count to ten, or, in his terms, delay reaction. Delayed semantic reaction, he asserted, is a primary benefit of extensionalization. The use of general semantics, and extensionalization in particular, automatically introduces delay in reactions, transforms "the animalistic (human pathological) signal reactions of low conditionality into human symbol reactions of full conditionality, by the stimulation of the cerebral cortex."

A New Grammar

General semantics is not "semantics." The field of semantics is about the meaning of words. It can include the logic of language, grammar, philology, etc. General semantics goes far deeper. It is about the fundamental system of neurolinguistics perception. It is about achieving an accurate representation of what is actually going on. It is about understanding the trouble we can get into by plunging into abstract conceptualization – from interminable disagreement to bloodshed to crippling insanity.

Extensional Devices

In the second edition of *Science and Sanity*, Korzybski introduced what we might call a new grammar. He called them extensional devices. "Extension" is distinguished from "intension." Intentional thinking is about words, words on words, words about words. Extension is about what is happening here and now: What Is Going On? (WIGO)

There are six extensional devices which I will describe very briefly:

1. Indexes: Indexing is a mathematical procedure for designating a series of terms, e.g., x_1, x_2, x_3, ... x_n[6]. The index can be used for individuals, $Smith_1$, $Smith_{2, \ldots}$, $Smith_n$, but equally for objects, such as his pencils ($pencil_1$, $pencil_{2, \ldots}$, $pencil_n$). Korzybski explained: "When I talk about humanity, I am always conscious that every member of our species is absolutely unique." It means that when we

[6] The nth term is the theoretical final object of the series although it can be, like the grains of sand around all the oceans an unimaginably huge and indefinable number.

particularize, we no longer talk about humanity in general terms but rather about members of the human family we know, like Tom and Mary. We are thus conscious of what is actually going on and not some abstract quality that is merely coincidentally related to the current experience.

2. Dating: Dating an event reminds us that we cannot step into the same river twice. Time represents constant change of context. Korzybski repeatedly pointed to the importance of knowing when something occurred. He made it very clear that the science of general semantics in *Science and Sanity* is "circa 1933." General semantics continues to evolve. Dating is not only very specific in placing an object or event; it also implies the process of change. It is good to know that an idea comes from a particular time, but it is even better to understand that our perception and understanding of "meaning" is different now than then. We all change our minds, we all learn, we know we progress through stages of maturation and that we get older. Vast new knowledge and more powerful means for distributing knowledge are introduced every day.
3. Quotation Mark: Korzybski employed the quotation mark to bring attention to a word or phrase, perhaps to denote that the statement is someone else's words, but more importantly to bring attention to a particular meaning the author has in mind. To use a quotation means, "pay attention to this." Korzybski used quotation marks to indicate that a term is an abstraction and that we need to be very sensitive to its multiordinal (see below) meanings. He emphasized that quotation marks mean the term is "loaded."
4. Hyphen: The hyphen links words that should never be used separately but nonetheless typically are, often with serious consequences. Korzybski was very clear about the importance of eliminating such constructions as "mind and body," "space and time." As noted, the Greeks did a thorough job, aided and abetted by the Scholastic and Enlightenment scholars such as Saint Thomas, Descartes, Kant, etc., in driving a conceptual and functional wedge between the mind and body. Newton did the same with space and time. This is the ultimate application and consequence of elementalistic thinking. Einstein did the reverse: He united space with time with a new, non-elementalistic, non-Newtonian, paradigm of physical reality: Space–Time. He said one simply could not deal with space independent of time. The same understanding, Korzybski stressed, is required for mind–body. In Korzybski's own words: "If we decide to face empirical reality boldly, we must accept the Einstein-Minkowski four-dimensional language, for 'space' and 'time' cannot be separated empirically, and so we must have a language of similar structure and consider the facts of the world as a series of interrelated ordered events, to which as above explained, we must ascribe 'structure'." Yes, we are careful to be sure we are thinking and talking about the event in front of us, but we also have to be conscious of the interdependent, holistic, non-elementalistic reality of the empirical world. The real world is about how things relate to each other.

5. Etc,: Korzybski wrote: "Ā-systems[7] (Non-Aristotelian systems), being extensional, require the enumeration of long lists of names, which in principle cannot be exhausted." He wrote: "I base the Ā-system on extensional methods which necessitate the introduction of a new punctuation indicating the 'etc.'" A period, he added, is a very poor way to end a sentence. He advised the punctuation "." to end sentences where appropriate. We can clearly grasp the concept of etc. when, for example, we speak of a sequence, say of positive integers: 1, 2, 3, 4, 5, ... etc. We learn early in our mathematics training to extend other sequences, say multiples of 3: 3, 6, 9, etc., or powers of 2: 2, 4, 8, 16, etc. We could do that, for example, with the major cities in North America: New York, Boston, Montreal, Chicago, Vancouver, San Francisco, etc. We could list categories of cities in order of size, the ten largest, 25 largest, 100 largest, etc.
6. Multiordinal (m. o.) terms have different meanings at different levels of abstraction. Confusion of orders of abstraction consists of setting a fixed, 'literal,' and permanent value, on the term. A m.o. term can have no general meaning apart from context. Recognizing this we avoid identification and misinterpretation. Multiordinal terms may be very specific within a context, and in that context alone, it will be perfectly clear. Multiordinality benefits us in a variety of ways including a tremendous economy of time and effort, greater versatility in expression, avoiding confusion in meanings, and giving us greater linguistic flexibility.

Conclusion

The terms described above are key formulations in general semantics. The understanding and use of these terms dramatically clarifies thinking and communication. They are simple formulations – deceptively simple. They are, however, not taught in schools and universities. Indeed, even the general semantics community has largely ignored them.

We must remember, as Korzybski said (and this applies to all the topics in this post): "... by assigning single values to the variable, we make propositions ... and so investigation and agreement become possible, as we then have something definite to talk about ..." and "... in doing this (assigning single values to the variables), our attitude has automatically changed to an extensional one."

General semantics is a package deal. I feel that too few of Korzybski's "students" appreciated the fact that it is a complete system. For that reason, I created the Korzybski Institute for the Study of General Semantics blog site. The objective of the blog site is to present Korzybski's system as I believe he intended and not as an offhanded interpretation.

Exercises

Again, review, analyze and summarize what you've learned from this chapter.

[7] He defined his abbreviations for Aristotelian (A) and non-Aristotelian (Ā), Euclidean (E)and non-Euclidian (Ē), Newtonian (N) and non-Newtonian (null-N).

Korzybski's *Science and Sanity* is a daunting book. It is worth the effort for those with the knack for this type of presentation. As noted, my approach is what might be called orthodox. Essentially, if you don't replicate what he had to say, you just won't get it.

The key principles of Korzybski's general semantics, as presented above, are easy to learn, easy to apply; indeed, common sense when you reflect upon them. Work on them one at a time. I believe that if you apply these tools as a practice, life will become more coherent and manageable. You will be dealing with life as it unfolds, attuned to the experience you are having, capable of formulating problems and solving them in such a way so that they produce results in the present moment.

Ditto the six extensional devices, the "new grammar." Work with them one at a time. General semantics is real-time, here and now. It is a direct and intimate connection to the world around us. It is based on what natural evolution has made us. It takes us beyond superstition and speculation. It sharpens and refines our perception. It provides us with the means to reach a common understanding of the world we live in. And that is about "practice." Below you will find some guidance on practice and mastery.

The use of these ideas needs to become a habit. It takes a bit of time to develop new habits. You will need to persist for a period of weeks, perhaps a few months for these habits to become second nature.

Chapter 2: Korzybski's Neurophysiology

Korzybski provided us with a unique view of human neurophysiology: We are our nervous system, he insisted. We are a network of nervous function that we may describe as starting with our senses and coming to a nexus with our higher mental functions. In between we find a myriad of neurological structures that collectively define our perception.

Nature has been producing living organisms on Earth for four billion or more years; starting with single celled organism which evolved to higher organism and with these higher organisms increasingly complex neurological functioning. We are the product of that process, a unique product.

What distinguishes the human organism is a function we call the "mind." The mind is a function of the nervous system and particularly the cortex. The quality that defines the mind is awareness and twinborn with awareness is our capacity for abstract language. In short, we are aware of our own existence, we are aware of the world beyond our skin, we are aware of past, present and future, we can imagine and anticipate and plan actions, in short, we think and to think we must have high-level language capacity; one that is unique[8], as far as we know, to us.

The "human" brain began to evolve in a succession of species only within the last two or three million years – a tiny fraction of the time life appeared on the Earth; and the modern brain, that possessed by Homo Sapiens, appeared perhaps 200,000 years ago. We don't know why or how the human brain evolved to its final form, but it was, speaking geologically, a very rapid evolution.

The human brain is an appendage of the nervous system. Structurally there are three "brains" involved with the cerebral cortex and cerebrum wrapped around the two more primitive structures. The brain occupies a volume of roughly a quart, weights about three pounds and contains some 86 billion specialized cells called neurons, of which about 16 billion are in the cortex. There are at least as many glial cells in the brain, that, at a minimum, provide structural support for the neurons.

Each neuron has the capacity to form thousands of connections and in terms of networking probabilities, the number of such connections, each of which might be considered the equivalent of a digital computer bit, is incredibly enormous. These connections suggest the complexity of organization of the human brain. Korzybski calculated that only one million (a small fraction of the total) neurons, connected only with two others at a time (again an artificially limited number), form a network of $10^{2,783,000}$ connections. This number he compared to the then estimated number of atoms in the known, visible, universe, some 10^{66} (more recent estimates put the figure at 10^{80}), which is infinitesimal in comparison. We only use a small part of this potential. Modern research suggests that the average human brain may have up to 10^{15} functional connections. By comparison, the number of bits that can be stored a computer with a terabyte hard drive is somewhat under 10^{12}, or one-thousandth that of the human brain.

[8] While our capacity to think as we do is unique, according to what we know of biological evolution, given the proper natural conditions such as we en joy on the Earth, the evolution of mind is inevitable. Nature evolves in the direction of increasing complexity.

Given that the average book contains $7x10^6$ bits of information, if the human brain was a storage drive, it could store the content of a billion books. Compared to that of the US Library of Congress, which stores 16 million volumes, the capacity is really awesome. However, the human brain is not a digital storage device. Some researchers have suggested the brain never forgets anything, but few people have large, accurate and easily accessible memories. The brains' function seems rather the processing of information[9]. And if there is any lesson in the history of the evolution of the human brain, it is that this function evolved for the very specific purpose of solving problems. What the cortex does is give us the capacity to transform experience into symbolic thought (language). The purpose of thinking, therefore, is action; action first to secure survival and second to improve the quality of our lives.

Will the human brain continue to evolve? Will it continue to grow in size? While there have apparently been some adaptations, perhaps mutations, in the function of the human brain over the last 200,000 years, it is unlikely that we will take the course described by many science fiction writers; wherein the skulls of "advanced" species become enormous as the volume of brain tissue, which is causally linked with "intelligence," expands over eons of time. The answer is that the size of the brain is likely optimum for the human body type. It uses 20% of the body's total energy[10]. We would have to evolve larger heart, lung and digestive systems to support larger brains and a means to dissipate the heat such an organ would inevitably produce. That larger brains would be more intelligent is not a foregone conclusion and that is evidenced, as below, by the simple fact that we haven't yet learned to use what we've got very well.

A similar argument is now made for developing computers with human equivalent processing capacity. If we continue development of computer technology at the current rate we will eventually achieve and surpass some degree of human "equivalency," which is an as yet undefined parameter. Estimates are that the world's most powerful supercomputers are at about one-fifth this capacity. We are developing machines with a capacity to learn; to formulate and solve problems for which they have not been programmed, in short to learn, or artificial intelligence. But will such devices become self-aware, like HAL in Clarke's *2001*? We know little more about profound self-awareness than that resides only within the human brain. Would intelligent computers be human[11]? Lacking the neurophysiology that defines us would they have emotions? Would they be capable of love, compassion and humor? Could they be creative; could they produce art, poetry and literature? Lacking the architecture of the nonlinear neuronal network of the brain, could they replicate the function of the human brain at all or merely produce an analog?

The problem that occupied Korzybski is that despite our awesome potential capacity to think, we don't do so very well. His solution is that in order to understand how to think and act more effectively (let alone avoid insanity) we must understand how the human

[9] As we will see in "The Integration of Human Knowledge," there has been considerable work to combine the functions of the human brain and the capabilities of the computer, sometimes called "augmentation of human intelligence."
[10] This is about the amount of heat from a 25 watt incandescent light bulb.
[11] Isaac Asimov and Clifford Simak have written numerous science fiction stories about robots that achieve and even exceed human capabilities.

nervous system works and address the problems that come out of our heretofore-poor understanding of and misuse of that capacity.

The problem he undertook was the fact that although we are intimately defined by our nervous system, and have the science to better understand it, we stubbornly rely of belief systems that are detrimental to our sanity and survival. In his words:

> *'Philosopher', 'psychologist', 'logicians', [note the quote marks] mathematicians, etc., are somehow unable to comprehend that their work is the product of the working of their own nervous systems. For most of them it is only detached verbalism such as we often find in hospitals for 'mentally' ill. Their work simply has no connection with reality.*

In general semantics, he added,

> *… we deal with the living neuro-semantic and neuro-linguistic reactions, not mere detached verbal chatter in the abstract*

It is necessary to understand that all thinking is the product of the human nervous system, of "*living reactions*." It comes out of engagement with our environment. Korzybski's condemnation of detached verbalism is severe and unequivocal:

> *It is pathetic, if not tragic, that society should invest millions of dollars to support such specialist who train future generations in maladjustments just because they disregard the unavoidable neuro-linguistic and neuro-semantic effects of their teachings on the lives of their pupils.*
>
> *Most scientists and educators are either entirely innocent of these problems, or indifferent and passive, or even negativistic."*

In short, not a small part of the issue addressed here is the nervous system but that isn't the total picture. Once we understand what is under the hood, we still need an operator's manual. That is what general semantics provides.

There are a number of different ways psychologists and neuro-scientist approach brain function. The behaviorists, for example, consider the mind a simple machine that can be programed, or conditioned. Metaphysical and many religious and spiritual practices believe that there is a higher mind that is imposed on the puny, mortal, human function if we so choose to attach to it. Platonic realism is such a belief system. There are those who believe the mind must function purely rationally, others who believe we must rely on intuition. Aristotle provided a system of formal logic, which has been developed to the present day. Korzybski believed those forms described above are not by any means compliant with the brain's natural function. Then there is mathematics, which Korzybski considers highly consistent with the natural functioning on the nervous systems. The bottom line, however, is that Korzybski wanted to know how the human brain/mind actually works, not how we think it should work.

Neurophysiology

A compact and succinct description of the human nervous system is not an easy thing to present. Considering that it is the most complex structure in the known universe, and one that even the most brilliant scientist have but a limited understanding of, the problem of understanding its organization is a challenge. Korzybski closely studied the available literature of his day and consulted with specialists. Obviously in the 80 plus years since he published *Science and Sanity*, there has been incredible progress in both

neuroscience and psychology. The equally incredible development of communication, computers and digital technology, which many who followed Korzybski hoped would be used to enhance the human mind, have added other layers to the complexity of understanding how the human mind functions. Bottom line, however, we are still trying to solve the same problems we were then and haven't gotten much better at it. Decoding the DNA, putting space probes on planets and out to the farthest fringes of the solar system, and the awesome technology that goes into a pocket-sized "mobile device," while impressive, do little to solve the problems of human life. Einstein said it, a lifetime ago, that we can't solve our problems with the thinking that created them; but we haven't changed our thinking. Korzybski worked to allow us to do that. A lifetime after his passing, can we say we have seriously given it a try?

Korzybski put a lot on emphasis on the idea that living entities are electro-chemical organism; that is they function by chemical reactions. The nervous system is a specialized electro-chemical system that serves the specific purpose of transmitting signals around the organism. The skin that encloses our physical body consists of a number of structures that serve the purpose of sensing conditions in the outer environment: sight, hearing, touch, smell and taste crudely define these functions. There are other senses within the body that act to inform the regulatory functions of the brain as to the condition of its working from moment to moment. Signals are thus transmitted, as in the case of the microphone and camera on our cell phone, along a network of "wires" (nerves) via "electrical" impulse. The lower brain, which has the purpose of regulating the function of the body, interprets incoming messages and sends return signals to the myriad glands, organs, etc., to maintain ideal states, correct problems and mobilize muscles to take action.

Much of this flow of data is accessible by higher brain functions if we choose to pay attention to it and understand what is going on. You can get all the information you can stand about the human nervous system with a few strokes of the keys, but it is a mass of information that seems to be mostly written by scientists. But what you will find in a Google search will likely be confusing. Korzybski sought to rectify that problem, often in disagreement with the "experts."

Let me repeat that the human nervous system, which includes our brain, is arguably by far and away the most complex system in the universe; some say more complex than the universe itself. As mention, the human nervous system is an evolved function. We should not take that fact lightly: We are the product of four billion years of the evolution of life on this planet. One of the most egregious mistakes naturalistic idealism makes is to ignore this fact and impose "higher consciousness thinking" upon the subject of nature. This is a reversal of the natural order of life, and represents, as Korzybski repeatedly pointed out, a good definition of why we keep painting ourselves into the corner trying to solve personal, social and even global problems. We have to give way to the simple facts of life and not impose abstract interpretations of the way we would like them to be.

Lets start with a very basic, and useful, definition of the nervous system from Wikipedia:

> *The **nervous system** is the part of an animal's body that coordinates its voluntary and involuntary actions and transmits signals to and from different parts of its body. Nervous tissue first arose in wormlike organisms about 550 to 600 million years ago. In vertebrate species it*

consists of two main parts, the central nervous system (CNS) and the peripheral nervous system (PNS). The CNS contains the brain and spinal cord. The PNS consists mainly of nerves, which are enclosed bundles of the long fibers or axons, that connect the CNS to every other part of the body.

At the cellular level, the nervous system is defined by the presence of a special type of cell, called the neuron, also known as a "nerve cell". Neurons have special structures that allow them to send signals rapidly and precisely to other cells. They send these signals in the form of electrochemical waves traveling along thin fibers called axons, which cause chemicals called neurotransmitters to be released at junctions called synapses. A cell that receives a synaptic signal from a neuron may be excited, inhibited, or otherwise modulated. The connections between neurons can form neural circuits and also neural networks that generate an organism's perception of the world and determine its behavior. Along with neurons, the nervous system contains other specialized cells called glial cells (or simply glia), which provide structural and metabolic support.

The neuron was discovered in 1900 and its basic function explored to the present day. There are hundreds of different types of neurons. What distinguishes them is that they transmit information via a structure called a synapse via chemical or electrical impulses. There are also hundreds of different types of synapses. Most synapses are chemical and in these connections there is a gap between the neurons across which a particle, a neurotransmitter, must pass. Some synaptic connections are persistent and in these we find the property called a memory trace.

The human mind is driven by sensory stimulus. Korzybski liked to use as an example of sensory stimulus the act of pinching one's finger or ear lobe. The sensation appears to register in our minds instantly. In fact, there is a speed limit to neural transmission of about 255 feet per second (155 miles per hour)[12]. Synoptic connections are polarized causing nerve impulses to move in one direction. These two facts are exceedingly important because the nervous system therefore gives structure to experience. That structure comes out of unidirectionality and finite speed of neural transmission. It introduces the element of time or sequence to our experience[13].

The central nervous system, as indicated above, consists of the spinal cord and the brain. The spinal cord is the main trunk line of the nervous system. It is well protected by the bony structure of the spine for obvious reasons. It is connected to the brain at the base of the skull, another protective bone structure[14], and within the skull resides the organism we call the brain.

In addition to the unimaginable complexity of what we have already described, the architecture of the brain is incredible. There are three primary structures: Forebrain, mid-brain and hindbrain. The spinal cord connects to the hindbrain, the cerebellum. The cerebellum controls the body's vial functions such as breathing and heartbeat. It also controls movements learned by rote such as those used in playing music and sports[15]. The mid-brain controls voluntary movements such as the eye. It is also associated with hearing, motor control, alertness and arousal (sleep and wake states) and temperature regulation.

[12] From toe to brain this is still only a couple of hundredths of a second.
[13] In a computer, electrical impulses move that the speed of light, a little less than a foot in a nanosecond, one billionth of a second. Computer circuits are also unidirectional and structured by the speed of light.
[14] Over which we often have the good sense to wear a hard hat or helmet.
[15] Also called "muscle memory."

The forebrain, or the larger outer structure which we see in images of the brain, consists of the cerebrum and underlying structures. We know it as the image of two wrinkled hemisphere. The wrinkles give the brain greater surface area, which is important because of what covers its surface. Covering the cerebrum is a thin, quarter of an inch or less, layer called the cortex. It is in this thin layer that most of our thinking takes place[16]. The two hemispheres have distinctive cognitive function: The right side is associated with pattern recognition and intuition, the left with language and logic. Probing deeper, we find a mass of tissue that connects the two hemispheres, the corpus callosum.

The cerebrum has been divided into four lobes, each with a specified function:

- The frontal lobe is associated with reasoning, planning, parts of speech, movement, emotion and problem solving.
- The parietal lobe, which is located immediately behind the frontal lobe, is associated with movement, orientation, recognition and perception of stimuli.
- The occipital lobe, which is located at the back of the brain, is associated with visual processing.
- The temporal lobe, on the side of the brain, is associated with perception and recognition of auditory stimuli, memory and speech.

Moving to the bottom of the brain, the hindbrain, we find several structures dominated by the cerebellum. The cerebellum is an earlier, often called our “animal” or even “reptilian” brain. It has the function of regulating and coordinating movement, posture and balance.

In between is, well, the mid-brain. It is another older brain structure that includes the thalamus, hypothalamus and a couple of other structures. Some call this the mammalian brain. Its function is to regulate emotions. The thalamus is nested just under and has intricate connections with the cerebrum.

That gives us a dust jacket description of what, as I said, is the most complex structure in the universe. So what does it mean? I could have given a description of the Library of Congress in about as many words as an introduction to a body of knowledge that includes all we know about the brain and all that the brain has produced[17].

Human Neuro-logical Function

Korzybski gave a great deal of attention to the thalamus, which is a primary center for coordinating the nervous system. It thus has a very strong influence over perception and communication. It is an affective center. It has no cognitive ability. It is the source of the s. r. (semantic reaction) that can reduce people, he observed, to animal forms of coping. Such responses are characterized as unthinking and emotional. He concluded that if these lower, animalistic, responses could be controlled there would be "a marked development in poise, balance, and a proportional increase in critical judgments.” That the job of the cortex.

In the cortex, as described in the article on the structural differential below, something important occurs, experience is translated into awareness and awareness into

[16] Korzybski liked to quip that what makes us human is “A quarter-inch of cortex,” which he pronounced with an impressive accent.
[17] All of which, theoretically could be digitally stored in the brain, would occupy only a small corner in our skulls.

language. The outcome is ideally reason – good thinking, or as Korzybski would say, evaluation. More typically, however, our rational capacities are awash in a sea of hormonal responses associated with lower brain function. Our thinking can actually aggravate our problems. We have an emotional attachment to ideas, derived through verbal abstract "reasoning" that simply have nothing to do with the reality of the world that impinges on our senses. From Plato to Descartes and in the halls of academia, we have a "realistic" perspective that essential denies reality to the physical world around us of which we are, Korzybski emphasized, an integral, organic, component.

The thalamus and sub-cortical levels can block or weaken nervous impulses that should, optimally, pass through to the cortex. This blockage results in primitive or animal behavior. Only by removing habitual blockages can the higher functions work correctly. The mechanism of identification works at this lower level and "the chasm between human affairs and sciences becomes wider and wider."

Korzybski emphasized that with: "'general semantics' we deal only with *neuro*-semantic and *neuro*-linguistic *living reactions* of $Smith_1$, $Smith_2$, etc., as their reactions to neuro-semantic and neuro-linguistic *environments as environment*." He added that general semantics is not a study of ethics or morality but a training "in consciousness of abstracting, consciousness of the multiordinal mechanism of evaluation, relational orientations, etc., which bring about **cortico-thalamic integration**, and then as a result 'morality', 'ethics', awareness of social responsibilities, etc., follow automatically."

Semantic Reaction

Semantic reaction, abbreviated s. r., is the emotional response to verbal stimulus and thinking. We argue about reason and emotion, that science and some forms of philosophy require emotional detachment from their subject, but the reality is, as described above, that the thinking center of the brain overlays and is totally integrated with the feeling, or emotional centers. A word or phrase, whether heard, read or thought, can, and very often does, evoke a feeling that runs from happiness and bliss to fear and anxiety to murderous anger and hatred.

The purpose of general semantics is to improve understanding, to improve communication, to enable us to better evaluate and share meaning from our experience. The understanding we derive from experience depends on how we use our mental abilities – on how well we think. The nervous system, as indicated, functions to coordinate activities in the body. To this end Korzybski sought first of all to define what proper mental function and language behavior are not and goes to considerable lengths to describe behavioral traits that are the clear consequence of limited or distorted capacity in this regard. Any conflicts or impediments to nervous function reduce the effectiveness and survival potential of the organism. In animals that usually means death in short order. In humans it is often expressed as mental illness. In human society it takes on other forms called social disorder. The price of collective dysfunction can be truly appalling as we see in war.

Our higher nervous functions are simply appendages to the nervous system. Our higher nervous system overlays existing structures evolved in primates and even lower orders of vertebra. To a large degree we have response patterns similar to those found in animals. Much of our nervous function follows the same old pathways through the lower

brain. An exchange of words, even a glance, can set off a sequence of emotional responses leading to flirtation or to tragedy, or both. If we are to make progress we must understand how we think in both physiological and psychological terms.

Our emotions are based on the flight – fight response as in other animals. Physically we are not very good animals. We are not very strong and not very fast. Matched barehanded against most predators and human beings become dinner. Give the puniest human a gun and a little skill, however, and even the fiercest predator becomes a head on the den wall. Long before the gun many species, including powerful predators, such as the saber-toothed tiger, and great beast such as the mastodon, succumbed to no more than stone-tipped spears, plus cunning and teamwork, as humans expanded across the globe. That lethal teamwork came through language, evaluation and planning.

Interestingly, another fierce pack animal, the wolf, was tamed and became a human companion. This early talent for manipulating the environment, plants and animals, lead to agriculture and then to civilization. It's something nature made the human brain to do.

Humans lack basic instincts common in animals. For example, many animals have locomotion and can feed themselves within minutes of birth. Because of our large brain cases we are born far earlier in our physical development and must thus be nurtured through an extended period of helplessness. As Institute of General Semantics honorary trustee Bucky Fuller was fond of saying; all human beings are born naked, helpless and ignorant. Children don't learn to walk for a year and don't know how to find food and shelter for many years. Humans must learn manual skills and they must learn to think in order to survive. Nowhere in our makeup does it appear we have the capacity to revert to animal instincts and survive. In the rare case of a child born without a cerebral cortex, or in the more common cases of injury to the centers of higher nervous function, humans become not feral but helpless and are generally institutionalized.

How we think, however, can be a problem. Modern knowledge of human biology makes it clear there are certain erroneous, false-to-facts, assumptions about human neurophysiology, inherent in the Aristotelian system, and particularly that mind and matter are separate things, that are contra-survival. The medieval Scholastics taking it a step further said that spiritual and physical existence are separate and distinct. Such speculation is for now outside the scope of empirical understanding. However, whatever the as yet unclear nature of mind and spirit, empirically they are attached to body and associated with higher nervous function, i.e., the cerebral cortex. Body and mind function as a unit. The sensory and nervous system are very closely linked with an extremely complex assortment of hormone producing organs. And granted, these speculative systems often sought to bring our animal instincts under control. Korzybski pointed out the association between organism and environment in eloquent terms: "The organism as a whole reacts to the environment as a whole." Cause and effect is so complex and interactive that it is very difficult to isolate any direct relationships let alone accept that any part of us exists in isolation from any other.

He wrote further: "The difference between the 'inside of the skin' and the 'outside of the skin' establishes the organism-as-a-whole." The development of the nervous system created a more elaborate structure of organism and more complex reactions and behaviors.

The nervous system defines both perception of an environment and the organism's reaction to it. Human beings, of course, have an extraordinarily elaborate nervous system — far more complex, and therefore far more structurally elaborate, than animals. Our mental capacity defines our humanity. To ignore these higher functions and the structure they innately impose, and to copy the lower functional structural dynamics of animals, gives us just another way of being unsane. Insanity is not necessary a defect of the mind. Indeed "it takes a 'good mind' to be 'insane,'" Korzybski once quipped.

The problem with language is not the words – although they cause their own difficulties – but the relationships between those words. The problem is how accurately this verbal structure describes experience. We are not helped by the fact that everything in the world is structurally related to everything else. The world is truly complex. We cannot proceed without this simple fact of relationship for it is fundamental to attaining any real understanding of personal experience. In a similar manner we are both troubled and empowered by the indescribably complex nature of our own cognitive processes. The brain/mind is not simply a processor of information: It is a knowledge engine. The brain doesn't merely sort and store incoming neural data: It processes and consumes it to generate its own informational energy.

Evaluation in general semantics goes beyond mere thinking and calculating. It is a holistic response of the human organism to stimuli. It involves the outer environment and internal experiential and emotional states. General semantics attempts, Korzybski said, to work out a "theory of evaluation which is based on the optimum electro-colloidal action and reaction of the nervous system, which brings about cortico-thalamic integration." With general semantics we begin to assess not only the validity and accuracy of our communication but go to the very roots of consciousness and sanity as well. Bois wrote that: "The general purpose is to liberate ourselves from preconceived ideas, hidden assumptions, and rigid ways of thinking." In this manner we evolve our capacity to evaluate from primitive-pre-industrial consciousness to the classical-mechanical model, and now beyond that to the level of null-A (non-Aristotelian) psycho-logic.

The problem is accentuated, in Korzybski's words, because (and I repeat and expand this quote): "In the work of general semantics we deal with the living neuro-semantic and neuro-linguistics reactions, not mere detached verbal chatter in the abstract. . . . The analysis of such living reactions is the sole object of general semantics as a natural empirical science." As relativity and quantum theory have demonstrated, reality is a joint enterprise between the observer and the observed. Because we humans are such an active element in the process of observation and action we must always be acutely aware, "self-reflexive," of our involvement in our environment regardless of how passive and objective a role we choose to play.

Sensory channels must be considered as the medium between objective reality and consciousness. Since sensory organs employ the nervous system, both must be considered in the holistic mind-body model. The fact is that our senses are at the lowest order of function of the perceptual process. The senses are intermediaries between the world of events and our perception of those events. A vast number of books have been and continue to be written about the role of the senses in cognition. Ultimately, however, our success in

the world derives from our ability to extract meaning from experience and employ the understanding gained for our individual and collective advantage.

Given that our senses are limited (able to perceive only narrow bands of the vibratory spectrum) and not very reliable, they can act as a barrier between the objective and subjective worlds. Only through the most rigorous methodology (e.g. science, mathematics and general semantics) can any congruence be realized between existence and understanding. An excellent example is found in the fact that we perceive a chair as a solid, when science tells us that, sub-microscopically, it is almost entirely empty space. Korzybski gave a more concrete example of sensory illusion (in *Manhood of Humanity*) with the illustration employing three buckets of water, one warm, one cold, and one room temperature. If we place a hand in the warm water and a hand in the cold water we clearly feel the temperature differences. If, however, we suddenly plunge both hands into the room-temperature water the sensation is astonishing. He gave another example to illustrate the role of the mind in perception as follows: If a statement, say a newspaper headline, is held just beyond the range it can be read the letters will be indistinct. If you tell the subject what the headline is about they will likely be able to read it clearly. Perhaps more than anything else this experiment demonstrates the great power of mental function in perception – that something very powerful is occurring which directly affects, and is not entirely the subject of, our understanding of the world around us.

NEURO-SEMANTIC RELAXATION.

So what do we do when we find our nervous system over stimulated? In essence, Korzybski wrote, we must "integrate the "cortico-thalamic functions." We can do that by simply taking a deep breath, counting from one to ten, or other common practices; but there is more to it in general semantics. The objective of semantic relaxation as defined in general semantics is to bring about normal levels of blood pressure and circulation, through the reduction of emotional tension, necessary for the proper working of the nervous system. Korzybski added that we are normally unaware of the cause of many of these tensions, but they lead to a variety of physiological problems. It takes an understanding of certain principles as described following.

Two of the most important terms we must deal with in a Ā system are 'relation' and 'order.' 'Order," in a perceptual sense, derives from the structure of the human nervous system. The nervous system, as noted above, is a medium that establishes a finite speed to the movement of nervous impulse, as noted some 255 feet per second. Like the speed of light this is a structural standard. The brain itself is composed of layers including the highest and latest level of structure, the cerebral cortex. The cortex can act only in reference to the lower centers, the sub-cortex, the thalamus, the brain stem, the nerves and senses. Out of this vast complex of neurons emerged human intelligence and all the advances in science, technology and civilization. But it takes work to make it function correctly.

A language of structure depends on the order of interrelated parts. "All empirical structures involve relations, and depend on multi-dimensional order. A language of order, therefore, is the simplest form of language, yet in structure it is similar to the structure of the world and ourselves," wrote Korzybski. "Mind" cannot be isolated but must be seen as

included as an integral part of our structure of relationships. Order, again, comes out of the finite speed of nervous impulses and the (complex) structure of the nervous system. Activities occur in sequence and pattern, each in turn conditioned by the other.

Korzybski placed great emphasis on the fact that mathematics is structurally similar to the human nervous system. Only if the objective and verbal worlds are structural similar does the empirical world, and our place in it, become intelligible. The similarly is verified by experiment. Only when fortified by empirical evidence do we feel secure. Otherwise we are overcome with psychopathological anxieties. In reality we have allowed our old language traditions to shape our s. r., resulting in the "prevailing depression and pessimism."

Language and culture are human environments to which we attempt to adapt. A structural readjustment requires a fundamental scientific revision of our doctrines and of our s. r. Both capitalists and communist[18], Korzybski pointed out as an example, have failed to realize that 'material' progress is due to the "*brainwork* of a few mostly underpaid and overworked workers, who exercise properly their higher nervous centers." Both systems seek material development for the sake of animal comforts, thus "fail to lead to greater happiness or higher culture." Indeed it leads in the opposite direction. Both systems miss the Ā revision of the economy required and the need to pass control to *professionally trained*, honest, intelligent and scientifically trained, *public servants*. It is a matter of consciously selecting our lot. Our present problems are acute and cannot be solved by conventional means.

"Everything in this actual world is structurally interrelated to everything else," he added. We have to build a new language to encompass that reality. First we must ascertain the empirical structure of the world. Second we must include human neurophysiology. Third we must embrace the unspeakable level of experience including associated emotional feelings. We must attend to the functional order of events. And always we must keep in mind that we are human and not animals.

Colloids

Where Korzybski is going is towards a science of mental health. Given, as argued above, we are an organism in an environment and within the human organism is a nervous system linked with the environment, our internal state depends largely on how well we represent the outer world within our nervous system; more specifically, within the function of the cortex. When they are out of sync we experience states of anxiety – from the jitters to full-blown psychopathologies. This he concluded had much to do with the electrical state of the body, a state upon which our physical health and nervous function depends. He delved deeply into "the medium in which life is found, namely … the colloids," emphasizing that "so powerful is the colloidal structure of life that it solves the 'body-mind' problem that has plagued us for thousands of years."

Colloids occupy the submicroscopic level he often referred to. Colloids are a class of material, distinguished from crystalloids "which form 'amorphous' or gelatinous masses and do not diffuse readily or at all through animal membranes. They occupy the realm from

[18] Korzybski foresaw a struggle between the United States and the Soviet Union, on the order of the Cold War, in 1933.

barely discernable, through the microscope, to the dimensions of molecules, about 1000 times smaller than we can see with the microscope (circa 1933). Colloids share with molecules the property of electrical surface energies which largely define their behavior." These electrical charges preserve the state of suspension. In the absence of these charges the particles coagulate or precipitate and the organism is dead[19]. Colloids are inherently unstable complexes continuously transformed by the effects of "light, heat, electrical fields, electronic discharges and other forms of energy."

Colloids represent the link between the inorganic and organic. They are a basic condition for life. "That fact," observed Korzybski, "also suggests entirely new fields for the study of the living cells and of the *optimum conditions for their development, sanity included*." As they are affected by physical, chemical and electrical phenomena in the body, he wrote: "This would explain why any factor (semantic reactions included) capable of altering the colloidal structures of the living protoplasm must have a marked effect on the behavior and welfare of the organism." The effects include those which define physical illnesses such as "fever, chills, headaches, convulsions, vomiting, diarrhea," etc., and mental illnesses including "identification, illusion, delusion and hallucinations." Bacterial diseases, he noted, occur when microorganisms produce acids that upset colloidal equilibrium. It has been clearly established "that all nervous and 'mental' activities are connected with, or actually generate, electrical currents, which of late are scrupulously studied by the aid of an instrument called the psychogalvanometer."

Jacques Loeb[20] and others pioneered studies of the influence of environmental conditions on simple organism's stimulus-response reactions. Psychiatrists observed the effect of not actual but perceived stimulus in humans, for example attacks of hay fever stimulated by the sight of paper roses. The implication is the role verbal suggestion plays in psychosomatic illness. For humans language is part of our environment and has its own power to affect the mental and nervous and physical state of the human organism.

How does general semantics fit into this discussion? Our use and abuse of language, identification, elementalism, etc., has a very real consequence in terms of thinking, emotional states and physical health. In this regard, Korzybski addressed the distinction between intension and extension. Intensional definitions are generalized characteristics of a class of entities. They are words about words. Extensional definitions embrace the unique quality of the experience we are having. Extension is consistent with the natural order of the nervous system. Intensional definitions reverse the order, disrupt nervous function and endanger survival. The correct order starts with the senses and the processing of sensations through the lower to the higher nervous centers. Ultimately it is the content of experience that determines the function of the cerebral cortex.

The Aristotelian system has no place for relations because it uses a subject-predicate form. The form is inherently symmetrical: A=B and B=A. The Ā (non-Aristotelian) system must be non-symmetrical. Structural terms include before, after, greater, more, less, above, past, etc. Order can only be expressed in terms of asymmetrical relations. The organism as a whole is also defined by the relationship between its parts, plus something extra; that is, it is greater than the sum of its parts.

[19] "Coagulation" is slang term used in the general semantics community (at least at one time) that meant death.
[20] Behavioralist psychology founder John B. Watson was a student of Loeb's.

Korzybski concluded: "It is well known that all life-processes, 'feelings', 'emotions', 'thought', semantic reactions and so forth, involve at least electrical currents" which are able "to affect the colloidal structure on which our physical characteristics depend, obviously 'feeling', emotions', 'thought,' .; (etc.) in general *s. r*., which are connected with manifestations of energy."

Korzybski also wrote: "It is positively known that s. r. are intricately connected with electrical currents, secretions of different gland., (etc.) which in turn, exert a powerful influence on colloidal structure and behavior…imposing delusional s. r. on the undeveloped child which must result in at least colloidal injury, which later on facilitates arrested development or regression…"

The body is an electro-chemical engine. It employs both chemistry and electricity to carry out its basic functions. Nerve energy involves electric current. Cells are colloidal structures and sustain life through the presence of electrical charge. A disturbance in the electrical charge of the nervous system has the potential to affect both the chemical and electrical function of cells throughout the body. Since the body is a single and interdependent system, anything that affects a part of it affects all of it.

Wrapping Up

The basic response mechanism of an animal is flight or fight. Animals operate in a state of constant alertness to signals that indicate food or danger. Early psychologists studied the nervous responses of animals in an attempt to better understand human nervous responses. Korzybski took important clues about nervous responses from Pavlov and others. Pavlov demonstrated very clearly that dogs could be trained to respond to acoustic stimuli (for example, a ringing bell) as though food were actually present (causing salivation). The responses animals have are analogous to certain human emotions. They demonstrate the totality of nervous reaction. Animals have evolved to respond to their environment as a whole. They react instantaneously and totally to stimuli.

Pavlov discovered that a sound could substitute for a powerful physical stimulus, like food. Korzybski carried this observation to the point of developing a detailed model of how verbal symbols affect both the lower and higher nervous centers in humans. He demonstrated that words create nervous reactions and physical changes in the body. This is what he called the "semantic reaction," or s. r., for short. From there, he reasoned, in order to change our animal-like behavior we need to train our nervous systems, our s. r., to react differently. Reaction in humans is a habit, not an instinct. Habits can be replaced.

Going back to the theory of time-binding in *Manhood of Humanity*, Korzybski observed that non-optimal, animalistic responses are not only copied from animals but can be handed down by verbal means from one generation to another. Human infants begin life with very primitive s. r., one of identity and confusion. As they grow up they are very receptive to the more elaborate forms of adult maladaptation. They learn from the older generation without rethinking the purpose and function of these responses. They learn a heritage that comes from a very primitive, warlike culture extending to pre-Homeric Greece. These remote ancestors, as Thomas Hobbs put it, lead a life of "continual fear and danger of violent death; and the life of man, solitary, poor, nasty, brutish, and short" (in his *Leviathan*).

Unlike animals, humans apply their considerable cunning to the development of sophisticated yet totally primitive patterns of s. r., among which are modern organized warfare and “no prisoners” competitive commercial practices. It is found in professional athletics. Since the primary instincts of humans are far weaker than those of animals, the full expression of s. r. must come through the higher functions. In this case the cortex comes to the service of the thalamus — exactly the reverse of the proper order of function. The cortex justifies and gives great power to the often-murderous instincts stimulated by emotional responses. Korzybski learned a great deal about the nature of primitive s. r. on the battlefield and through his study of the mentally ill. The obvious connection is that these inherited response patterns are not conducive to sanity, or life itself.

A s. r. is an emotional response. Korzybski defined emotions as "first order" effects. The human organism learns to construe feelings long before it masters words. Feelings are integral to meaning and have a powerful influence on how we interpret experience. We readily remember how we felt about an event long after we have forgotten the details. We know that thinking is influenced by feeling, but know little of how thinking might influence emotion. S. r. in humans is never simple. No event is ever simple and our responses are frequently unpredictable. When the higher centers are overwhelmed by events, the lower centers work overtime. The s. r. can be a simple reflex or, through reinforcement, it can attain major behavioral significance. Awash in negative emotions our behavior reverts to animal forms.

What we experience in modern life is vast, unsettling, change. Pavlov and others observed that change produces disorientations. He saw that our response to change can be reinforced through repetition. In time we develop relatively fixed patterns of response and thus we learn to deal with life, for better or for worse, through habitual response. S. r. works deep in the nervous system. It produces colloidal changes in the cells. Life, as noted, is founded on colloids. We might go farther to say that life is a product of colloidal and electrical energy. S. r. produces various forms of nervous energy and this energy affects the environment of the cell. Colloidal changes can be manifested as the symptoms of disease.

S. r. is an impediment to evaluation. Only a few people, Korzybski noted, have nervous systems sturdy enough to overcome the effects of semantic disturbance. Many have a sense of ethics and morality, of right and wrong, truth and falsehood, which animals do not. But they may or may not be consistent with the reality of the world outside. Humans are deeply affected by false-to-fact ideas. Factual experience produces a sense of harmony. Falsehoods produce a state of restlessness, of disharmony and cognitive dissonance. Falsehood, and repressions of truth, such as those perpetrated by politicians and talk show host, agitates the mind of the masses. Korzybski sought to formulate a new form of s. r., a new form of evaluation, in "terms of structure, relationship and multidimensional order." The pursuit of structural knowledge helps to eliminate cognitive dissonance. Where the nervous system is fed a steady diet of true-to-fact experience it tends to be balanced and harmonious. To produce a new s. r., a new system of evaluation is required. Old patterns of s. r. have to be broken and replaced by new ones. The result is "genius." Indeed a new system would produce an abundance of genius, he thought.

How a new s. r. might work can be illustrated in the field of race relations. S. I. Hayakawa[21], with his personal experience of prejudice towards the Japanese before and during World War II, had a great deal to say about this subject. He observed that virtually anyone can come up with a long list of words used to belittle people because of race, religion and national origin. These are hate words. They are powerful and deeply rooted in belief systems. They are primitive to the extreme. Both slavery and the caste system have been, and still are, defended from sacred texts. The poison is spread through custom. Children learn racist attitudes from their parents. Racist attitudes are built into the language. Europeans are white and other races are colored: yellow, red, brown, black. "White," in our language, represents light, life, good and God. Black is equated with darkness, death, evil and Satan. Good guys wear white hats and shining armor. Bad guys wear black hats and dark, "discolored", armor. During wartimes we institutionalized programs of dehumanization of enemies and liberally apply pejorative labels — as they do to us.

The mind has many functions. They include language, self-consciousness, memory, perception, reason, intelligence, emotion, intuition, creativity, habit, consciousness, and the subconscious. Korzybski tried to narrow down the definition of consciousness into a few concrete terms. Memory is important – we are time-binders after all. Self-consciousness is central – we are self-reflective mapmakers. And we are, or have the potential to be, conscious of abstracting – mindful of the chain of semantic linkages between an object and our experience of it, and the verbal forms we employ to attempt to understand the objects of experience.

The mind is an intermediary between sensory experience and language. In very real terms the mind projects order into sensory data. We already have a rough map of our world and for better or worse we will use it to force order into the flow of sensory data. The trick is not to be so rigid, so emotionally attached, as to refuse to change the map. The map is relationships, structure. Only structure has meaning. Structure is the way ideas, labels and symbols are organized. The structure can be extremely complex and fluid, like the play of a ball game, a chess game, or getting through a strange airport. Once we have a representative map we can begin to make sensory data work for us. If we are willing we can add new information to our map – we cannot only learn our way around a new airport but we steadily learn to more quickly adapt to new airport experiences. The more airports, or other, experiences we gain, the less self-conscious and more confidant and expert we become at mapping them.

Many modern psychologists, as Korzybski often pointed out, don't seem to be aware of the distinction between human and animal nervous function. Maslow[22] and the third force, or humanistic, psychologist of the 60s and 70s, took a bold, daring and controversial step. They sought to move beyond the narrow constraints of behavioralism – which rejects higher human mental function – and Freudian psychoanalysis, which focuses almost entirely on mental illness. They saw more than the animal in us, and more to human nature than just illness. The humanistic psychologists were typically better informed about the principles of general semantics than their more traditional colleagues.

[21] Hayakawa's own perversion of general semantics is itself an example of generating harmful s. r.
[22] Maslow studied general semantics and was a Korzybski memorial speaker.

The cortex is the locus of higher order nervous function. If we ignore its functions we fall into patterns of misusing them. Most mental illness, Korzybski observed, is of semantic origin – it comes from a poor understanding of higher order, and especially language, function. He thought that a dangerous, non-survival trait in humans. If we work to improve language function we work to switch the cortex completely into the nervous system thus releasing higher mental ability, including true genius, and obtaining emotional balance. The key to accessing higher function is, of course, getting the cortex "on-line." We have a choice.

We know the animal-emotional response is quicker than the cognitive response. Emotions surge forth like water from a fire hydrant. Modern neuroscience has precisely timed various nervous responses and has demonstrated that it takes longer to actually interpret a word than to respond to it emotionally. We know it takes longer to respond to a verbal stimulus than a physical one. We are actually conditioned not even to pause to interpret it – just respond to it.

Responses to semantic stimuli can come in several forms. A trained response is much different than a gut response. Fighter pilots are trained to the point of instinctual responses. There very lives depend on responding correctly to every attack and the many emergences that arise from flying fast and powerful aircraft. Surgeons know not only the routine procedure but also "instinctually" how to respond to medical emergencies. A martial artist practices techniques tens of thousands of times to learn the correct and automatic response to virtually any attack. These are patterns of response willfully programmed into the lower brain. Emotion is a hindrance to appropriate response. It is a hindrance to surviving under fire. Fear, anger, and worry – all detract from performance. Higher mental function overrides instinctive emotional response and gives humans a vastly enhanced potential to survive and to perform effectively under great pressure.

There is a story of a great Samurai swordsman who hunted an enemy for years. When he finally confronted his foe, prepared to kill him, the foeman spat in his face. He became angry so he turned away – no longer willing to fight in a way that would bring dishonor to his art. The great boxer, Mohammed Ali, was famous for taunting his opponents. Since his opponents were experienced, fearless, cunning fighters but violent men are moved to anger and Ali knew that if he provoked their anger, he could more easily defeat them. His colorful behavior in the ring and his personal convictions outside the ring made him a legend. He was loved and he was hated. He made you relate to him emotionally.

Korzybski knew that the key to accessing higher order function was to somehow derail the emotional response – to dampen the semantic, emotional, reaction. It isn't really a new idea. Korzybski gave a number of examples of old folk maxims: "Think twice," "hold your horses," "count ten." Johnson gave some others: "look before you leap," "stop, look and listen," " don't go off half cocked."

Semantic reactions and disturbances are things that happen to us as a result of our encounters with life. Korzybski said that our responses to life "are based on the neurological interplay, the number, and multidimensional order of superimposed (not added) positive and negative factors". These responses are expressed in terms of

intelligence, happiness, sanity, ethics and progress – or in the opposite way. Our response is based on our structural assumptions and not on rational methods, facts and objective reason. We react emotionally to things we don't understand and to our structural assumptions about how the world is supposed to be. Our responses are often expressed as "confusion, bitterness, hopelessness, and other forms of s. r." It is not only internal but also projected into our perceptual environment. It is a thoroughly semantic reaction.

Lack of structural investigation, Korzybski said, is the cause of old s. r. This has to do with the semantic, vs. the neurophysiological, aspect of the response. Conditioned reflex has no time delay. It doesn't involve thought. We tend to respond to a signal, not a symbol, by conditioned reflex. A delayed reaction is a symbol reaction. S. r. is a signal reaction. Signal reactions tend to be "abnormal, unreflective and pathological," said Johnson. They tend to manifest as reaction to the word and not the thing itself.

Delayed reaction, Korzybski said "involves a complete checking of the affective response". You learn it by stopping to check your feelings, by struggling to get your emotions under control, by training, by using the Structural Differential. Delayed reaction is essential to adequate evaluation. It is the key to new s. r. It gives time for the cortex to come on line. Replacing it with another s. r. eliminates a bad habit. The higher order response inhibits nervous reactions, reduces the influence of the lower centers and, by issuing a new set of orders, reverses negative emotions into a positive response. A moment of silence on the objective level may be all it takes.

Korzybski wrote: "So we have an exact natural order of evaluation which, for the first time, can be conveyed with the aid of the Structural Differential by all available 'sense' organs, thus the ear, the eye, touch and kinesthetic 'sense,' so uniquely important in learning. Thus:

The Natural Order of Evaluation

- Physico-chemical, electronic process, more important than:
- The 'object,' a nervous abstraction the brain, more important than;
- The verbal levels or descriptions, more important and reliable than:
- Inferences of lower order, more important and reliable than:
- Inferences of higher order, etc., etc.

Korzybski observed that, "our present orientations and semantic reactions are based on the reverse order of the natural order of evaluation. The worst of it is that our home as well as our educational methods in schools and universities, train us in this pathological reverse order of evaluation, under which sanity is made almost impossible."

The organism functions as-a-whole. We can never separate it from its environment. In general semantics "the non-elementalistic treatment is broader than the organism-as-a-whole business." Related to this, Korzybski recommended Kurt Lewin's *Topological Psychology*. Lewin understood the relationship between the organism and its environment. To which Korzybski wrote: "The topological methods, although they are respectable mathematical methods, have no application until this work. The nervous system must be taken as the organism-as-a-whole. There is an outer environment and there is a "neuro-linguistic and neuro-semantic environment."

Visualization is vital to adjustment. The eye is an extension of the brain, not a sense organ in the usual sense. There is no 'optic nerve' but rather an optic tract which directly connects the outside part of the brain, which is the eye, with the rest of the brain." Our civilization has been brought under the control of the eye. The extensional method is 'eye minded.' Extension is dynamic, as is the world. Intension is static. Intension doesn't represent the environment.

Korzybski told his students in a lecture: "I challenge anybody here, staff included, to give me the name of one scientist of world fame, or not, who is 'scientific 1937.' This is serious. There is no one. Even Einstein will not fit. He has done his great work, but he knows nothing about neurology, psychiatry, General Semantics, etc. He cannot deal with neurology in a scientific way. Then we cannot say he is 'scientific 1937. You students here are more scientific 1937 than Einstein himself because you are getting the fundamental rudiments of methods and 'facts' from all braches of science, not merely one."

Returning to the eye, and to relation, he said: "Every kind of relation can be formulated to your eye as a visual issue." Since the eye is part of the brain it has a direct impact on the function of the cortex and the other parts of the brain. The structural differential is a visual aid. Korzybski again stressed its importance: "Many of my friends fancy that I am cranky about this structural differential, but some of my best students understand that for getting full benefit out of extensionalization it is impossible without actually playing with diagrams and charts like this[23]. This is a fundamental point of extensionalization, because it affects the thalamus as well as the cortex. Everything goes through the thalamus, and so the eye." The structural differential is a static representation of a dynamic process. But the little dance of electrons never stops. From the event our nervous system builds the object using a selection of the possible array of characteristics (the holes). There are holes without strings and holes with strings that do not connect to the object. These are the characteristics that are left out in the process of abstraction. "We visualize the natural order of evaluation," but we also handle the labels and strings. When you see an object, a chair, for example, touch it. With the structural differential, shake the label. Move your hands. "That little wiggle really does the trick. It will help you." He called this "shake yourself," and said: "When you shake yourself in that ordered series of abstractions, you are inwardly ready to map a successful adjustment. You have the secret of clarity, all of which is not verbal. It becomes organismal and kinesthetic. That is when you become stratified in four dimensions. You have added acuteness to your brain. You have engaged yourself organically into thinking, more than just using your 'brain.' Then you begin to orient yourself as-a-whole, which is non-elementalistic."

Korzybski opened one of his seminar lectures by saying how pleased he was with the "results of the lectures and the private conferences I have been having. This means that extensionalization works; some things are beginning to click." Coming to the end of the seminar he stressed the need to convey not only the theoretical issues but also their application. He quipped: "By the way, do not treat me as a lecturer talking to students. I am having a colloidal nervous jazz trying to reproduce similar colloidal jazzes in your nervous systems. All action is by contact."

[23] Handling of objects, the sense of touch, is another extension of the brain and one of great importance. The human eye-hand coordination is unparalleled. We learn through our hands.

He added: "You have received through your training special colloidal jazzes in your nervous system, and if you cannot convey that colloidal jazz to the student, you have not accomplished anything. Extensionally you are not a teacher to a student, you are a neurological colloidal jazz, transforming the neurological colloidal jazzes of your students. If you do not accomplish that, you have accomplished nothing as an educator. It's hard to deal with a large class. The students appear as morons. Rather you simply failed to teach them. Making a joke is a good example. If you make someone laugh they have grasped an extensional structure you attempted to convey. Laughter comes not from the words but from the extensional structure itself. Intensional subjects tend not to be funny."

The nervous system of every individual is unique. Brains may be alike in corpses but not in living individuals, Korzybski observed. True, much of our habitual behavior is conditioned by the 'old' brain. "The nervous systems of infants and dementia praecox are over-dispersed" [colloidally] and it is not accidental that dementia praecox exhibit infantile characteristics and vice versa." Can this predominantly thalamic behavior not be changed? Yes: "with the application of physico-mathematical methods, we can introduce thalamic factors into language which give us a general method applicable to education as well as to psychotherapy by which 'human nature' can be changed." The intensional orientation must be replaced by the extensional and "extensionalization requires a complete re-orientation and a permanent use of these [extensional] device." Thus the cortex will be able to "delay thalamic reflex reactions." This helps us deal with the increasing complexity and stimulation of modern life. Training involves the use of extensional devices, the structural differential, and the visual and kinesthetic senses "(the use of the hands)" in order to distinguish different orders of abstraction.

As a final thought, I am intrigued that, as far as I know, Korzybski never included emotional (semantic) reaction in his structural differential. I visualize this process as a sidebar, or perhaps an enclosing cylinder, that starts with the objective level and extends through the levels of abstraction. It would be good to explore the increasing disjunction between emotion and reality as we proceed to higher orders of abstraction.

Chapter 3: Structure

Let me begin by asking: What is structure? The dictionary says, first, that structure is "A complex entity," then that structure is "a configuration of elements or parts within that entity." Already we are in trouble. If we want to understand structure, we must dig deeper. How else may we approach this? Let's call structure by another name: Order. In the same breath we may reflect that if defining structure as order was a problem in Korzybski's day, how much more so is it in our day? Obviously, getting to a clear understanding of "structure" may be of great benefit and if we can learn to create some sense of order in life, we have made some real progress.

The structure Korzybski is talking about is, of course, the structure of language. He is also talking about the structure of experience. It is a problem of the congruence of language and experience. It is, further, the problem of, first, perceiving order in experience, and second, expressing that order in clear language: In short, conveying one's personal experience to other people in a way that they can relate it to their own personal experiences. We see this working in mathematics and science and thus we will see a lot of science and mathematics in Korzybski's effort to improve human communication. The language of math and science demonstrates that structurally correct language is feasible. The problem is how to make this higher form of language more generally applicable to human problems. That is precisely the problem Korzybski attacks in his formulation of general semantics.

We begin with an oft-repeated phrase coined by Korzybski: "The map is not the territory." A map, be it a chart, a diagram, a picture, or any other visually descriptive device, is a rather vague representation of reality. If I plan to travel around Chicago, for example, I may purchase a street map. After a week driving around Chicago, or any other city, I've learned two things: First, a lot about Chicago has become part of my personal experience; and second, that my map does only limited good. I may seek to drive to the home of a friend. It is easy enough to locate the route but negotiating that route is likely to be a significant experience: Toll booths, accidents, construction, vague signs, wrong lanes, traffic congestion, buying gas, weather conditions, etc. Many city maps show only major streets. Once I arrive at the nearest major intersection, I must do something else to get into the finer detail of the neighborhood. Today map services provide detail right down to the address. And I must not forget to ask where to find a parking space. By the end of my visit, I can, and likely will, on a personal and mental level, annotate my map considerably. By this time, we map readers are dealing with experience, with personal reality, as well as fuzzy abstractions.

Of course, today we use GPS. Just plug in the destination and the course is plotted for you. On the GPS device screen, you see a tiny segment of Chicago. It is highly convenient, but you have far less of a map of Chicago. Nonetheless, you may create a map in your head which gives the territory some sense of meaning. How you communicate that experience is another matter.

The Problem with Language

The problem with language is not the words – although they cause their own difficulties – but the relationships between those words. The problem is how accurately this verbal structure describes experience. Structure is, in fact, relationships. We are not aided by the fact that everything in the world is structurally related to everything else. The world is truly a complex entity. But we cannot proceed without this simple fact of relationship for it is fundamental to attaining any real understanding of personal experience. It is one of the essential principles Korzybski uses to go beyond Aristotle: We are at the same time troubled and empowered by that principle, in Korzybski's words, non-elementary allness.

In a similar manner we are troubled and empowered by the indescribably complex nature of our own cognitive processes. The brain/mind is not simply a processor of information. It is a knowledge engine. The brain doesn't simply sort and store incoming neural data, but it also processes and consumes it to generate its own informational energy.

We have a lot of capacity for that. The human brain is a structure that is potentially as vast and complex as the entire physical universe. Korzybski made an early attempt to estimate the "size" of the human brain – at a time long before the more detailed picture we have of neuro-anatomy today (1933, 161). He noted that research indicated that the brain has $10^{102,\,783,000}$ (10 with the exponent, the power of, 2,783,000) potential synoptic connections. Each of these connections may be considered, at the very least, the equivalent of a computer bit, a binary digit that registers either zero or one, off or on. The physical universe contains an estimated 10^{66} atoms. That means that the brain has the equivalent of $10^{2,782,934}$ bits available for each atom in the universe. Given that a book, lets take a big one, *The Holy Bible*, contains some 7,000,000 (7^6) bits, it is obvious that the information we could store with a single atom equivalent would exceed the capacity of the world's libraries. It would be nice to have a computer chip with that capacity. It would give us more ready and accurate ability to recall. But that is the subject of another chapter.

What I am attempting to illustrate is that these numbers don't even begin to make sense. We are working with the crudest sort of map of human brain capacity, trying to understand something we can't even begin to comprehend. These numbers probably are nowhere near the truth, but they illustrate a simple fact by analogy: We are attempting to understand the structure of the virtually infinite with a structure that itself is virtually infinite. One is composed of matter and energy, the other, while associated with a physical structure composed of matter and energy and constrained to operate within the limits of physical laws, cannot be explained in physical terms at all. The one, the realm of matter, is governed by a process that dissolves order, called entropy, the other is governed by a process that increases order, we call neg-entropy. It is a unique capacity of living organisms but takes on a very special reality in the human brain.

Such analogies are purely fantastic, of course. The universe is incomprehensibly vast. Human society is inconceivably complex. The mind is simply inconceivable. And beyond that we talk about spirit and a universal, creative force. No human brain can more than begin to comprehend more than a tiny part of any field of understanding. But we must grasp the essential fact that the mind has so far proven to be equal to every challenge of

fact-finding and imagination, of exploration of the physical and the mystical – except possibly the problem of communicating between one conscious entity and another.

What we cannot ignore is that our minds seek to comprehend all this. The human mind is by any measure of science a truly awesome thing without any real conceivable limit. Our knowledge of physical existence expands geometrically as we seek to understand it. Engineers turn raw knowledge thus gained by inquiring minds into useful mechanisms like computers, aircraft, bridges, architecture, and communications tools. Computers and communications tools increasingly augment the telecommunication systems that link mind to mind. A growing mass of humanity is linking minds through the virtually instantaneous international World Wide Web, the internet, and bandwidths are steadily expanding to allow more and more through-put. The flow of information across the internet--originally intended for scientific exchanges--encompasses all aspects of life--science, business, finance, personal correspondence, computer software, vast stores of data, games, pornography, and e-commerce. At the time of this writing the internet was still in its infancy. As I will describe it below, people related to Korzybski, including annual memorial lecturers, worked with the problem of the integration of human knowledge.

We are dealing with the unique human quality of language. It is about an exchange of knowledge, indeed, of the accumulation of human experience, that aids our progress as an individual, a society or a civilization. Like the human brain, the digital realm is not growing as the result of any conscious effort but more because of people applying their minds to the problems of increasing the power of the links between brains. There is something essentially organic about the process. It seems to grow out of us without any master plan.

The most crucial problem of the information age has been the vast volume of data that flows through the various media. It is overwhelming and its is incomprehensible. It is probably an emergent aspect of human society – a new form of relationship, a new form of social function perhaps analogous to the formation of cities and nations. We don't know where it is going but already in Korzybski's day (circa 1933) the problem was battering at the walls of human sense-ability. It was already exerting a powerful influence in Emerson's day, at least a century earlier, at least in the rapidly growing industrial and commercial cities like Boston, New York, London, and Warsaw. Jefferson was perhaps one of the last truly universal “man,” one of the last to attempt to encompass within his own mind the whole edifice of European culture.

This was the problem at the heart of general semantics. Man is a time-binding creature but the vast acceleration of human progress in the absence of tools needed to properly evaluate what is happening is overpowering our limited capacity to cope with human society. Though there were many tools being developed for information management, the fact remains that we think very much today as we did in 1933 or 1833 or 1733, or, for that matter, in Aristotle’s day. The problem is: How do we bring some sense of order into this increasingly roiling chaos that is human society?

Again, let us ask: What is structure? The problems we face are, first, storing information in an accessible form. Second, structuring it in such a way, as in libraries, so that we can rationally organize and access the information. And third apply a system of

validation that insures there is some truth, some validity to the information so stored. Libraries and archives for books and papers, and even art and film, are well established and well managing. Korzybski gave this problem considerable attention.

Structure

Korzybski says, first, that defining structure is difficult and that "the main difficulty...was the absence of a clear formulation of the issue involved" (1933, 146). Lacking a clear image of the new structural language and lacking a clear standard of comparison, he was forced to proceed to develop a new formulation of language. We can, however, begin with a mathematical metaphor and define structure as a relationship or a configuration of relationships (1933, 248-9). It is a "complex of ordered, interrelated parts" (1933, 56) and it is "an array of unique and specific exact relationships." But it is more. Specifically, structure refers to the organization of language and experience, and the relationship between the objective world and our verbal construct of that world. Korzybski said: "A science of man depends on a new language structure. The structure of a language involves certain assumptions about reality. Scientific language develops in the natural order. Our limitation is not one of mind but of language. It is in old habits of speech--which do not permit structural correspondence. Words aren't the things--objects don't exist in isolation. General semantics thus succeeds where moralizing failed" (a natural ethic) (1933, 59-60).

In general semantics, meaning is a joint product of language and our reaction to it. For meaning to be true, language should be as close to the structure of our nervous system as possible. Otherwise, there is a dissonance, a tension, that reverberates in our nervous system. It is a form of mental illness. We must develop a new language and a new science of language if we are to succeed.

General semantics relies solely on structure as the only content of knowledge. Korzybski makes that point time and time again. What it means is not easy to apprehend. Objective reality is "unspeakable," therefore the relation between a word and an object can only be structural. Words are names for relations. They are like the lines we construct between mathematical points (or vectors which emanate from these points).

Language is a medium of communication – a carrier of information about the structural relationship of objects and events. But our current languages are structurally different from the world and from our nervous system. This difference is self-imposed. We have a choice in the matter. Korzybski said that to develop a more adequate language we must begin by studying the structure of the world. This begins by determining factual relationships within objects and events – empirical knowledge vs. opinion and speculation. Like Sgt. Friday said: "Just the facts, mam."

Language is a neurophysiological response to experience that occurs inside our skins. Words and symbols represent what is going on inside us. The event is outside. Our understanding of the external world, and even our sanity, is the result of achieving an internal representation of external events which is congruent with it. The problem is to make language expressive of experience and of our internal representations – both of which occur on the unspeakable level of awareness.

Language itself, however, is another of the great mysteries of life. It is an extremely complex and involved neurological function. It involves our entire organism. Far too few people ever attempt to fathom what is going on in their language usage. Few have any comprehension of the importance of what appears immediately above. They are subject to numerous unconscious factors that work against not only mental adjustment but also any revision of their daily habits.

Language behavior is both built-in and voluntary. Speech is an inborn capacity but much of our language behavior is copied uncritically. Korzybski reflected that "...the present state of the white race ... a majority of our self-imposed difficulty is due to the lack of scientific structural analysis, ... which lack makes it impossible to control or regulate [life]...." It results from the way we educate our children: The unrest, unhappiness, nervous strain, irritability, lack of wisdom and absence of balance, the instability of our institutions ... crime ... low professional standards of lawyers, priests, politicians [etc.] ... commercialism as a creed ... often lead to dogmatic and antisocial attitudes and lack of creativeness" (1933, 304-5). Or, in terms of the impact of the Aristotelian system, being structurally different from the empirical world, prevents adjustments and produces psychopathologies, including insanity. Empty structure is rife with undefined terms, with over/underdefined terms – terms for which we have no true definition no matter how hard we try – which produce blind creeds and old truths (traditions) consisting of words without meaning. It is a language that can proceed only by similarities and disregards differences – thus fails to learn in a rapidly progressing world. It is language that forces us to sort, choose and homogenize. Philosophers have tried for millennia to straighten out this mess. A few, chiefly epistemologists – students of the theory of knowledge, who employ scientific methods and holistic views of reality, make progress. All the other approaches, Korzybski said, produce semantic disturbances.

Human progress over the past two centuries has been identified with, more than any other subject, science. When we speak of science, we may include not only a method of observation and discovery, but also a unique language based on a special set of symbols including words, numbers and relational notations commonly called mathematics. Progress in science (from scientific knowledge we derive unprecedented advancement in material well-being) depends not just upon discovery and accumulation of facts but upon the formulation, in exacting and precise language, of well-established relationships between these facts. This is a task that science itself does poorly and, consequently, toward which engineering is employed only to produce products and constructions that serve a single, self-defined, purpose.

Korzybski lived through a time of great scientific, technological, and mathematical advancement – a time unparalleled in scope and power. He was contemporary with scientific legends such as Albert Einstein, Fermi, Heisenberg, Planck, etc. Korzybski was an engineer and mathematician, as well as an accomplished linguist. He could readily follow the unfolding events of science and mathematics in both the native language of the originators and through mathematics, the universal language about which English, German, Russian, etc., are merely descriptive appendages. He had an extremely rare talent for interpreting diverse fields of knowledge, translating their principles and world views, into a universal format, combining them into single structures of understanding that begin to

approach the natural inclinations for comprehension of the human nervous system. This is the holistic systems orientation which we are still pursuing.

Science, Korzybski explained, is a search for unknown structure. It is a process of discovering the structure of the empirical world. It involves the formulation of theories which represent that structure and then repeatedly testing them, time and time again, to see how they hold up. The ability of scientists to replicate an experimental or observational situation alone speaks volumes about the power of the scientific method.

When a scientist formulates a theory or hypothesis s/he is attempting to make a preliminary statement about structure dimly perceived. Einstein was a master in this field. Like many scientists he started with what was often little more than a feeling, perhaps an image, a vision if you will. These feelings defy description. They are on the unspeakable level, the objective level of knowledge. Unfortunately, scientists continue to proceed, despite the insights of relativity and quantum physics, in a limited, reductionistic and linear fashion, something he labeled "Aristotelianism."

Increasingly we are beginning to accept the fact that these feelings are a part of our daily lives and that they are also the stuff of the imagination of scientists. They represent a field of endeavor where both scientists and artists live their lives. But science, we might protest, is based upon rigid methodology, upon precise experimentation and verbal rigor, Korzybski reminds us. Facts are ordered in structural relationships, but, he notes further, until science works its magic these characteristics are hidden. They were always there. Science, coupled with a powerful creative imagination teases them out into the open. By doing so science creates order, it creates hierarchies of knowledge from feelings, from sensory impressions, from imagining oneself on the end of a beam of light, like Einstein did, from seeing the motion of an apple falling from a tree, as it did Newton, in a new way, in a way that stirs one to strive for explanation. This is seen in Einstein and uncounted other men and women in every imaginable field of human creative endeavor.

Science, whether physics or chemistry or biology, is based in part upon the actual structure of nature but in greater part on rendering our perceptions into articulate speech, or, in other words, in turning it into structures that are comprehensible by all human minds properly trained in appropriate symbolic languages.

The language of order is the simplest form of understanding, Korzybski continued. It has a certain quality. It is elegant and it is beautiful. Skeptics scoffed when Charles Lindberg could pick out an especially agile airplane without ever seeing it in flight. How could he, they challenged. Simple, he said: A good airplane looks beautiful. Einstein's relativity theory worked like that: $e=mc^2$. Simple, elegant, in a word, beautiful. But relativity is more than simplicity and elegance. The speed of light "c" is a constant. There is a limit, an absolute limit, to the movement of light. It is a finite and measurable quantity. This gives structure to the universe. It, like gravity, is indeed a fundamental aspect of the structure of the universe. That is as true in astronomical terms as it is on a computer chip where speed is limited by the distance an electron can travel in very small units of time – the speed of a computer chip is limited by its size, by how close components can be placed to each other so electrons can move between them. Computers use clock speeds (cycle

rates) of a billionth of a second. That is a nanosecond. Light will travel less than a foot in a nanosecond.

The late Grace Hopper, computer pioneer, first U. S. Navy woman Admiral, used to operationalize a nanosecond by passing out pieces of copper wire 11.8 inches long. I use one of her nanoseconds as a bookmark in my copy of *SCIENCE AND SANITY*. Grace also coined the term "computer bug" which was in fact a moth she found stuck in a relay. There was a Korzybskian mind.

Likewise, our nervous system works at a finite speed, far slower indeed, giving a very real structural context to our mental processes. The power of the theory of relativity was that it reduces the entire universe to a system of structural relationships. Newton did that too, but his model was short of the mark. The difference is not a matter of degree but a new paradigm, a whole new way of looking at existence. We must have that same attitude towards our own life, our more limited, more finite existence, and the structure of our very own nervous system. Korzybski summarized it in these terms: "...we live in a four-dimensional space-time manifold which, on all levels, consists of absolutely individual events, objects, situations, abstractions, and we must conclude that structurally we live in an indefinitely many-valued or infinitely valued world, the possibilities of which follow in principle the laws of combinations of higher orders" (1933, 466).

Aristotelian language, Korzybski noted, divides experience into discrete categories: Matter and energy, space and time, body and mind. In non-Aristotelian (Null-A) language matter, space and mind don't exist independently but as part of a continuum. Null-A language thus goes beyond A language: It encompasses it, it makes sense out of it as far as it goes, recognizes its limits, but it is more general, more explanatory.

General semantics requires that we develop linguistic habits that go beyond those of ordinary life just as science and mathematics go beyond our ordinary experience of life. Science and mathematics are learned skills – and learned attitudes. In a like manner, we must develop new habits of thought for proper evaluation of human-scaled events, events in society and daily life. We must treat a word like it was a line between mathematical points and development mental models that depend on the structural relationship of words. We must learn an experimental attitude and constantly test our models against observed reality. We must be prepared to have others examine our beliefs and put them to the test. As science depends on the four-dimensional relativistic order, so too must our mental constructs. Sanity, Korzybski claimed, is based on four-dimensional order: The integral (hyphenated) space-time must be incorporated into our internal representations.

There are obviously several barriers to application of scientific-mathematical thinking to daily affairs. Otherwise, we would have long since had a well-established science of man. The Greeks tried to create a rational model of human nature. They incorporated some important assumptions in their model, which have been taken up time and time again, that have been used as often to impede as to advance any real progress. Medieval Scholastic used Aristotle to defend the church against secular progress. Renaissance scientist, artist, engineers, and philosopher used classical philosophy with even greater success to establish a whole new way of thinking and of life for humankind but their descendants, the thinkers of the Enlightenment, rational classicists outdid everyone in

imposing their false-to-facts assumptions on reality. Newton and Descartes, Marx, Darwin, and Freud wrote themselves indelibly into history in the effort to build a new model of life and history and man. The sociological positivist from Comte to Parsons tried it. The behavioral psychologist Watson tried it. Modern academicians still struggle to bring scientific legitimacy to their fields. The lack of progress clearly indicates the overall lack of success of the Aristotelian system. The lack of success surely suggests some false assumptions and attitudes, and more, the lack of an imaginative effort to really try to go beyond authority and attempt to create a new model based on correct structural assumptions. Korzybski understood the basic nature of humankind. He saw to the root causes of our frequent failures to create a science of man. He clearly understood the limits of math and science when applied to the problems of life, particularly intelligent life. He was not so arrogant as to claim to have found the answer, but he attained an arguably justifiable certitude that he was on the right path. He developed a variety of tools and models, one of which was a unique mechanical invention he patented and called the "Structural Differential."

Structural Differential

If an engineer wished to develop a device for translating experience into a verbal representation, s/he would likely develop something very much as Korzybski did. Much work has been accomplished in recent years about visualization, diagramming, mind-mapping, affinity diagrams, hyper-text and even computer programs that sort ideas to try to establish linkages, structures, among concepts. Engineers understand drawings and they understand physical models and mockups. What they work with is the translation of lines between points, called drawings, into solidly formulated exact forms of engineering performance. It is a highly creative and demanding activity. But engineers do not bother themselves with the other end of the creative spectrum, attempting to translate physical objects and events into the words that can be organized into the formulation of concepts which can be accurately communicated from one mind to another. A lot of work has been done in cognitive psychology, for several generations, to make children and adults better learners but, again, little work has been done around the fundamental, or threshold, linguistic formulation or the job of getting from the experience to words. The entire corpus of Aristotelian education is based on the premise of communicating words: Starting with words and ending with words but not with the stage of cognition preceding words. Korzybski, I would suggest, is one of, if not the most important, founder of this area of linguistics and the structural differential is an invention of what I consider of surpassing importance, the Structural Differential. He devoted a full chapter to it, as have I.

You will find an image of a structural differential I constructed in my chapter on the “Structural Differential.” This is a short summary of that chapter.

To make the structural differential more fully understood, we must understand the process of abstraction. But to make abstraction clearer it is useful to understand the structural aspects of the preliminary stages of translating experience into language. Without going fully into some important dynamics regarding the stages involved in verbalization, let us get down to a model of experience. Our experience may be of an event or an object. Let’s pause for a second to look at the difference between an object and an event. It is a critically important difference. It is a matter of persistent patterns of

experience. An object often has temporal stability. A brick is likely to remain a brick for a considerable time. We can examine it at our leisure. An event, however, is fleeting. We must take a mental snapshot of it. But events do tend to recur and as we work on these recurring episodes, like our tennis game, we develop some real feel for that class of experiences. We get better at recognizing them, understanding them, and responding to them in real time. We learn to respond to them, first of all, on the "unspeakable" level – without linguistic analysis, without words, and without conscious thought. In short, our brain becomes programmed to instantly identify and respond to the occurrence of important events. Our right cerebral hemisphere provides the capacity to perceive patterns (the left side provides the words). With enough practice we attain a state of mastery – expert, skillful, deft, spontaneous, artistic, even elegant. One of the tragedies of modern life is that we live our lives at such a great pace and with such a high degree of change and novelty, that we rarely attain any great skill in any of the arts of living. If we are going to learn, we must stop and “smell the roses” – and more, want to know a lot about rose bushes and rose gardening. That is what the structural differential is all about: Taking time to analyze and understand objects and events.

There must be a certain degree of cooperation between our minds and physical reality for us to recognize an event or object. Something occurs. What is it? We begin by perceiving this thing through our senses – another incredibly complex process. There are five senses but at least 20 different sensory modalities. Korzybski classifies them into four kinds of senses: mechanical – touch; chemical – smell and taste; sound, and sight. Sound and sight are by far the most important for us. Sound is the medium of natural language. Sight has been called the master sense. The eye is a virtually a part of the brain extending beyond the cranium. It is the sense most highly integrated with brain function. It is by far the most powerful and subtle of the senses. Korzybski also considers it to be the most reliable. He provided several examples that distinguish the sensory functions of sight and hearing, not to diminish one but to accentuate the other.

Korzybski observed that many people are good at memorizing verbally but without understanding. These people "know about" a lot of things but can't do them. He also pointed out that auditory types are more detached from reality than visual types. He observed that the statement "I see," suggests a much greater level of comprehension than the statement "I hear you." He also noted that verbal propositions may be meaningful or meaningless – true or false. He offered a simple exercise to demonstrate the power of the eye in understanding, and conversely the role of the brain in perception. The exercise involves several newspaper headlines of equal size. Show them to your subject at increasingly greater distances until they are just out of range to be read. When you reach that point, when the words are just a blur, then hold up a new headline and tell them what it’s about and they will be able to see it. "Seeing is thus an aspect of understanding,” he notes. (1933, 181).

For humans, the experience of an event is the start of a complex process we call language. We learn to affix labels to our experiences, words. And then we generalize experiences through abstraction, and then a succession of higher order abstractions.

The structural differential (or "Anthropometer') is a physical device consisting of several pieces: A parabola, one or more circles and one or more rectangular pieces. The

parabola is a partial figure with a jagged line across the axis of the figure which represents an indefinite continuation. In the beginning of cognition is sensation. The parabola is full of small holes which represent characteristics – sensory data. How many? Potentially the number of characteristics we can ascribe to an event is huge. The circle represents an object or event. It is of finite size and is also full of little holes, or characteristics. Korzybski called this item the 'object." The third item is a rectangular "label," also full of little holes.

When we have an experience, we draw on our store of descriptive terms (in the parabola) and assign them to the object. As our experience of this objective increases, we find certain key elements and these become a generalization, the first rectangle below the object. There are fewer strings between these.

Korzybski insisted that we train on the objective level by using objects. His favorite object was the pencil. From the characteristics of the parabola, the universe, the object links with just those required to describe it: Wood, eraser, lead, etc. To the object we attach a label: "pencil: an object to write with." We must take care to use words that describe only physical structure. The characteristics we use vary according to the observer.

Korzybski noted that there is a great deal of difference between the perception of the object by a dog, Fido, and a man. To Fido the object remains unspeakable, but it does have characteristics, especially smell, which for a dog is the primary sense. That's as far as it goes for a dog, but not for humans. For humans the process consists of drawing from the universe of characteristics, the holes in the parabola, those characteristics which best fit their perception of the object. Korzybski did this by inserting pegs into the holes of the parabola to which are attached strings. The strings are in turn attached to pegs inserted in the holes of the object which are in turn linked to pegs inserted in the holes of the label. There are many characteristics into which pegs have been inserted and strings left hanging loose which illustrate that not all known or potential characteristics may be used. How the object is perceived, the characteristics assigned to it, depends on the different perspectives of different observers. Each will perceive the object "pencil" uniquely. With the label we begin the process of verbalization and with verbalization we can move on to abstraction: Words about words rather than words about objects/experience.

Korzybski made a very important note about the need for not only visualization but for the use of all the senses in learning. "...students," he said, "should not only hear and see the explanations but perform them for themselves, should handle the labels and indicate with their hands the different orders of abstraction" (1933, 470).

For me the tactile sense has always been important. From gardening to electronics to the workshop, there are many objects and numerous tools and skills which are organized (structured) in such a way as to bring about a desired outcome, be it a harvest of vegetables or a sound synthesizer. We have learned a great deal about how we learn through manual manipulation. R. Buckminster Fuller was a master at this process, which he called "making it visible." Physical models are an extension of this process. So is the simple act of writing – a link between the brain, the eyes and the pen that has incredible power to understand, as Feynman so capably illustrated. Richard Feynman said the words he wrote on paper were his thinking.

One should of course practice with the structural differential until the process becomes automatic, unconscious, a reflex in its own right. But it is hard to find a structural differential and it is perhaps not so convenient to carry one in one's pocket or purse. It is, of course possible, to make a sketch, a diagram. My years at the desk and workbench have taught me to fabricate my own ad hoc SD in almost any location. I use my desk as the "parabola," my universe, and objects on the desk as potential characteristics, frame out a space for my object and begin to organize characteristics. A handful of coins works well (I have a collection of metal washers). Korzybski made it clear that the parts of the SD should be handled.

I go one step further in that I attempt to organize characteristics into a pattern that depicts the structure of the object/event and often attach labels that become the equivalent of variables. I've also used what I call structural generators, established models. Geddes developed what he called his "thinking machine," folded paper. Fuller's synergetics is highly instructive, particularly his tetrahedron structure of a minimal system of thought. In this manner what I begin with at the objective level becomes a plan of action, a projection from mere description to potential, that is a future state, a more desirable or improved state for the next manifestation of the object or event.

The structural differential (SD) is a "visualization set." Korzybski felt strongly that structure requires visualization. Training in visualization is the first step in eliminating identification. In visualization, identification, he said, does not occur (1933, 457). Evaluation is thus correct. It has immediate benefits. It produces more efficient forms of thought. It shows us what a thing is actually doing. It goes beyond "know about" to knowing or understanding. It makes us more conscious. It allows us to reach into the unspeakable level of experience. It addresses all aspects of the nervous system and senses including the Jungian, if not Freudian unconscious). Training with the SD eliminates the conflict between higher and lower centers and thus eliminates many mental difficulties. It allows us to make the transition from the old, Aristotelian, semantic reactions to the new and improved form of evaluation which eliminates identification. It encourages students to become more extroverted, more observant. It eliminates structurally false assumptions. It replaces the "is" of identity as the structural link between the objective and verbal levels. It adds to verbal statements the structure necessary to make them meaningful. The mentally ill, he notes respond to retraining in non-identification (SD). For them it improves the affective response, the semantic reaction. It balances their internal world with the external world, reducing delusion. Semantic re-education makes many difficulties vanish. Verbal doctrine is robbed of its coercive power when the underlying structure is exposed.

This process, in short, is what Korzybski called, and insisted we achieve, the consciousness of abstraction.

I find Korzybski's discussion of structure instructive in several different ways. First it is the foundation of a better way of thinking. I am surprised that there has been so little development of the concept of the structural differential. Indeed, as far as I know, I possess the only physically constructed structural differential, one I made. Too often it is merely a chart on the wall, not a model. It is almost as if the principle it embodied has been lost. We are still trying to explain everything with words. Like him, I would suggest that much beneficial work yet remains in this area, especially benefiting from the advances in

cognitive psychology, neurolinguistics, computer modeling and hypertext. But for us structure is only the beginning. Once we have the words there is much more to be learned about how they are handled.

Chapter 4: The Structural Differential

Korzybski recalled a symposium in 1922 during which he had a sudden insight leading to the development of the Structural Differential. He was speaking at the New School for Social Research in New York, then under the influence of renowned psychologists John Dewey and John Watson (Watson founded the behaviorist school of psychology) and who were both in the audience. Korzybski regarded both Dewey and Watson as thoroughly Aristotelian.

THE MEASURE OF MAN

We need to pause for a moment and look at this idea of "Aristotelianism." You will find throughout Korzybski's works repeated references to Aristotle and discussion of the general semantic non-Aristotelian system. Aristotle is one of the great names of western thought, an ancient Greek, who formulated a logic that underpins modern scientific inquiry. But it is, today, a two-edged sword for it also formalizes the mind-body split that increasingly isolates us from the reality of the world in which we live. That split is arguably the most egregious error western civilization has embraced.

Aristotelian logic assumes a two-valued universe (yes or no, right or wrong), static and absolute values, symmetrical relationships between terms, dependence on words, assumes the word is the thing it represents, intensional[24] rather than experiential and extensional orientation[25], acceptance of unfounded assumptions, elementalistic (below), etc. The Aristotelian orientation is embedded in our society. It is manifest in the compartmentalization of knowledge and narrow specialization. It shapes much of the science of today including medicine, psychology and economics. In our complex world today, it virtually paralyzes the human nervous system.

In the Introduction to the second edition of *Science and Sanity* you will find no less than 52 factors that distinguish the non-Aristotelian system of general semantics from its antecedents. But back to the Structural Differential.

Having established time-binding[26] as the function that distinguishes "men" from animals, Korzybski was still challenged to describe how time-binding works. He felt under great tension to carry his point before this audience. He was, he said, "considered then a 'dreamer' and an 'idealist, and still 'unscientific' from the old delusional point of view." He knew Dewey and Watson were very intensional. Both men, Korzybski stated, believed "man *is* an animal."

Korzybski had not yet the means to convey his principles concisely but then, under the pressure of the moment he said that his whole theory suddenly coalesced into a visual form which he drew on the board, a "time-binding differential" or "anthropometer" (the measure of man)" as he first called it[27]. In a latter rendition of this story he said: "I sketched

[24] Defining words with words; dwelling in abstractions and absolutes that disconnect us from the reality of daily experience and the roots of adequately representing reality inside our skin.
[25] Extensional orientation. Awareness of sub-verbal levels, both in the external world and in one's own reactions—as opposed to intensional orientation, which is preoccupation with verbal levels: doctrines, beliefs, 'ideas,' dogmas, etc.
[26] The capacity of humans to accumulate knowledge and pass it on from generation to generation.
[27] Subsequently named the "Structural Differential".

for the first time the Structural Differential, the visual thalamic[28] statement of the premises and explained to them the difference between the human world and an animal world. … So this was really the whole beginning of G. S. (general semantics). Creative work is always produced that way. You 'get it' first, and then spend a lifetime verbalizing it."

I should note that there was a lot of animal research in psychology in those days (still is) and this was very much on Korzybski's mind at the time. Pavlov's experiments were part of popular culture. It was clear to Korzybski that animals could abstract only to a very limited degree. But this is not true with humans: "We don't stop abstracting," he noted. As a result we have made great progress in science and culture. The process of abstracting, consciousness of abstracting, can be trained with the Structural Differential. We can be trained in the natural order of evaluation[29]. Without this training, of course, tragedies frequently occur, he added.

Korzybski subsequently constructed models of his anthropometer out of mahogany and filed for a patent in 1923, which was issued in 1925 (patent number 1,539,194), for an "Educational Appliance" for which he made seven claims:

1. To demonstrate the working of a human mind and differentiate it from the working of the animal nervous and brain system;
2. The building up of abstractions[30] of higher and higher orders;
3. The fundamentals of the theory of relativity – that reality is made up of events: "made up of 'matter,' 'space,' and 'time' indivisibly connected, and can be divided only by mental process of abstraction;
4. The fact that "absolutism" (meaning the absence of the consciousness of abstracting) is a necessary condition for non-critical imitation of the animals resulting in the same erroneous beliefs;
5. The fact that the human mind when it works true to its natural laws must have the relativity point of view obtainable only by the consciousness of abstracting;
6. The fact that correct thinking and reasoning, of conscious abstracting, in order that one may fully realize that words, names or labels, do not cover all characteristics of an object, and that the characteristics of the object are not the same in number and quality as those of the event; and
7. The fact that with the consciousness of abstracting, the human mind works as human (as differentiated from animal) and must deal with abstractions as abstracts rather than with physical, independent, existing entities and must never "objectify" labels and symbols.

TIME-BINDING: A GENERAL THEORY

By 1924 the main outline of Korzybski's second book was formulated and appeared in two papers by the same title: "Time-Binding: The General Theory." The first paper was presented at the International Mathematical Congress in Toronto, August 1924, and the

[28] The thalamus is the seat of human emotionality in the brain.
[29] Evaluation. A non-elementalistic term, used to denote the total response to a situation. Total response includes visceral and nervous changes, 'thinking,' 'emotion,' verbalizations overt acts, etc.
[30] Abstraction: Confronted with an event, we can be aware of only a few of its characteristics. We can translate into symbols for purposes of transmission an even fewer number of such characteristics. Thus in evaluation, in representation, and in communication abstracting, e.g. a selecting of characteristics, always takes place.

second at the Washington Society for Nervous and Mental Diseases, June 1925, and the Washington Psychopathological Society the following year.

Korzybski began the first paper with reference to Einstein's theory of relativity, a then new formulation of physical reality. Einstein, he noted, corrected certain misconceptions about physical reality. Korzybski said he used Einstein as an example of how science progresses. "Truth," he continued, may be defined by date. The term "science," for example, has different meanings at different dates; it is different in 1924 than it was in 1824. Under the pre-Einsteinian system the Newtonian universe was absolute. After Einstein, the universe became relative. Newton defined the universe. Einstein stipulated a universe. The same shift of perception must happen with our conception of "man."

Korzybski laid out the principles of his human science. He stressed that it must take into account certain fundamental principles "or fail." The first is that our daily language is pre-scientific, elementalistic[31] and absolutistic. Korzybski referred to the attempts of a number of popular writers of the day to redefine language. They all wrote about organisms "as-a-whole," the need for greater clarity in language, the fallacy of subject-predicate language, etc. By and large, however, they failed to provide for how their ideals would be achieved. Korzybski said the answer is simple: We must have a new vocabulary, a language that describes the actual functional reality of human life in mathematical terms. Again, he insisted that the vocabulary (propositional values) must be based on things that ***exist***. It must be free from self-contradiction. The labels we put on our abstractions are not the things they represent. He added that what he has to say must be experienced by the reader – each of us must work this out to our own understanding. What can be shown cannot be said.

Korzybski discussed his Anthropometer and described its function. In the attached image are three objects. The top figure, "E," a truncated parabola represents the universe of possible human experience. Within this universe occur events, the perceptually persisting remnants of which are objects, represented by the circle "O," suspended below the parabola. Below that is a rectangle defined as a label, "D." All three parts have holes, which represent characteristics. In the realm of events those characteristics are infinite in number. At the object level "O" we have a finite size and finite number of possible characteristics. This represents the first abstraction. The label "D" is a symbolic representation (word) about the object. The label is the second order of abstraction.

"Fido" represents the animal level of perception. Fido has objects, that is, experiences, but little more. What Korzybski stressed is the tremendous difference

[31] Elementalism. Tendency to consider different aspects of a complex phenomenon as separate independent entities: 'substance' and 'properties' of matter; 'body' and 'soul' of living things; 'form' and content' in art, etc. ('time' and 'space')

between the abstraction process between man and animal. The human nervous system is capable of higher and higher orders of abstraction I_1, I_2, I_x. Fido is not. "Man" has the power of discrimination. We use both perception and thinking to test and to gain an understanding of reality. Fido does not. The distinction is all-important. It is "the solution of practically all human troubles."

Korzybski enjoyed a little joke, a deadly serious one: "Those who copy Fido *must* be *dog*matists, *cat*egorists, absolutists, "know-all's"; they must be fanatics, intolerant; when they meet others of their kind, a fight must follow, etc. They do not want to think, they are not interested to investigate…" He continued: "Man to be a man" knows what he doesn't know, wants to know more, to understand, to think. "

Korzybski stated that, "A man who understands and applies the Anthropometer will never take a word for granted; instead, he will ask indefinitely, "What do you mean?" and this, ultimately, leads to inquiry into facts, correct symbolism, and universal agreement." The Anthropometer gives us a consciousness of abstraction[32]: "The *feeling that we abstract* is all that is needed." The Anthropometer demonstrates the fact that the event level contains an infinite range of variables, the object, however, is relative to the observer and a best a poor and limited perception, yet some would fight and die for their abstractions. "*We do not need to doubt human reason, we should distrust our language*."

The Anthropometer teaches us to include the particularities that define an experience. Mathematicians, who tend to overly objectify, could benefit by learning to use the Anthropometer. Scientists by using it would understand that "there are no 'facts' free from some 'doctrine'." Economics would benefit tremendously. Children can and should learn it.

By giving each label a definition, we gain the means to investigate the structure of all human knowledge, Korzybski maintained. There will always be some undefined terms. Out of these, without due care, comes a false-to-facts metaphysics reinforced by the circularity of those undefined terms. By rejecting metaphysics, however, the "gross" empiricist goes to the opposite extreme, equally false to facts. As we improve our perception and understanding the world becomes increasingly knowable. There is a geometry in this structure, a feedback loop of steadily improved definition.

In psychiatry, the insane are made sane in an analogous approach, that is, by making unconscious premises conscious, they can be tested against reality and false, unworkable, doctrines thus resolved. In the progress of human knowledge, every revision, however painfully and slowly achieved, advances the collective knowledge of the race. This process is called science.

The Anthropometer is something that must not be talked about but used, touched, the labels pointed to. Korzybski kept a handful of labels in his pocket to take out, "to look around anew and label as I go, the results being all the time independent." Through this exercise a new awakening occurs. Korzybski kept an Anthropometer on his desk and used it frequently. He said that he is often shocked by his own fidoism, which is so deeply rooted in our culture. But consider the benefits to be achieved. Through its use "the masses [are]

[32] Consciousness of abstracting. Being aware of the non-allness of verbal maps and other abstractions and of the mechanisms and functional relationships involved in abstracting.

aroused, and *thinking* would start on an unprecedented scale, with all its beneficial results. The 'scientific temper' would overrun mankind in a few years, facts and correct symbolism would count, and the exponential law PR^{t} [33] would begin to work properly."

The Anthropometer, he said, should be introduced into elementary schools. Children can be taught a small, basic, scientific vocabulary and trained to think habitually in a new way. They are more attentive to lower order experience and abstractions. They will automatically adapt a non-absolutistic world blueprint. The longer you wait the more difficult the system is to teach. By the time a student is in a university they are too thoroughly indoctrinated.

Science and Sanity, 1933

In Chapter XXV of *Science and Sanity* (1933), Korzybski devoted a rather long discussion to the Structural Differential and its functions, which he used to recapitulate the previous chapter: "On Abstracting". He described and illustrated the structure differential in detail. The mechanism of abstracting he illustrated with an example of the 'pencil'. The object 'pencil', he said, at the submicroscopic level, is a nonrecurring "mad dance of electrons." But our experience of it is at the objective level of our senses. He reminded us that we abstract from the infinite number of possible characteristics at our disposal, a few that we define with the label we give to the 'pencil'. We are already at a considerable remove from the experience but are as yet still at a lower level of abstraction.

The importance of our Ā (non-Aristotelian) training is that we are now fully conscious of this process. We know the object *is not* the event and that the label is *not* the object. We are maintaining the congruence between our nervous system and the objective world and thus our sanity. We know that we have only a small part of the event, not all of it. We know it is a part of a much larger and interdependent whole. We are conscious of an object, the first order of experience, and a label, a second order of experience.

Referring again to the difference between man and animal he said that we have already parted ways with "Fido', that is, all animal forms of perception. Fido has an experience of the object but it is not the same as ours. Fido sees less of it and smells much more of it than we do. He may recognize it as familiar, as friend or foe, food, an object to urinate on, something to chase, etc. Fido may be a highly trained Seeing Eye or police dog. The experience may very well define his behavior but that is pretty much the end of it. For humans it is only the beginning. We add the label. Similar experiences accumulate. We can then make a statement that describes a nervous response to that label, a higher order of abstraction. We can make a statement about the statement and continue the process without limit. This capacity is uniquely human. Here is found the fundamental mechanism of the time-binding power which characterizes man, and which allows *him*, in principle, to gather the *experiences* of all past generations … to start where the former generation left off."

Korzybski noted a sharp horizontal distinction between man and animal. He proceeded to the sharp vertical difference that consists of the successive orders of

[33] The exponential law that defined the progress of civilization. From *Manhood of Humanity*, P represents the progress of a generation, R represents the rate of progress per generation, and t denotes the number of generations. The formula defines the total progress over the period specified.

abstraction. Here lies consciousness of abstraction. Fido cannot know that he abstracts. 'Man' may. Further, in this vertical distinction "we find the semantic mechanism of all proper evaluation based on *non-identification* or differentiation between orders of abstraction…"

Each experience of each object is unique, absolutely individual, at the unspeakable level. The objective level, Korzybski reiterated, contains no words. On the Structural Differential we can only, we must only, point to the objective level with our finger "or we shall never reach this level… We must point our finger and be silent." He repeatedly emphasized the need for silence and repeatedly said: "This is *not* this." Thereby we deny the 'is' of identity[34].

The characteristic that bests accounts for the primitive state of individuals and societies is identification[35]. Identification underlies the behavior of animals, infants and primitives. The prevailing "general structure," i.e., the physics and chemistry of life, of "the world was not different in prehistoric times from what we find today." The needs of animals, infants and primitives are direct: food, water, shelter, and safety. Nature provided much that was required – or not. This is life at the lowest levels of abstraction, in other words at the level of Fido. From the dawn of civilization to today the conditions of human life have become incredibly more complex. They are dependent upon higher orders of abstract thinking, mathematics being the highest order of thinking we have, the only one free from pathological identification. The difference this makes is that: "… a future Ā society may differ as greatly from present A society as the later differs from the primitive society."

Identification greatly impedes the progress of modern society. The resulting primitive form of behavior impedes our potential and threatens our survival. It affects our adjustment and sanity. We cannot communicate with animals, infants, and primitive people because the structure of their language does not embrace modern knowledge. It does not "differentiate relations enough." This is what the Structural Differential accomplishes. Korzybski summed up its function in these terms: "If we identify, we do not differentiate. If we differentiate, we cannot identify". Differentiation gives us orders of abstraction. It eliminates 'allness'[36], "the semantic foundation of identification." By differentiating between objective and verbal levels we learn to be silent on the unspeakable level, thereby introducing 'delayed s.r.[37]' which enables "the cortex to perform its natural function." Discriminating between the objective and verbal levels introduces the structural link between these two worlds. It allows us to discriminate between description and inference. We thus progress from a primitive or infantile state to maturity. We also become *social beings*.

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[34] Identity (Law of). A postulate of Aristotelian logic, A is A. Useful as a rule of consistency in discourse, dangerous when made the bias of a life-orientation. Automatically and compulsively reacting to a novel situation as if it were identical with one or more previously experienced situations that it somehow resembles. Also failure to distinguish between different orders of abstraction.

[35] Identification is simply the common confusion of words with the things they represent. Korzybski said: "The map is not the territory." The importance of this idea is that people behave as if words were things and not merely symbolic representations of things. How many would think this distinction is even relevant?

[36] Allness: A reaction in which the abstraction inside one's skin is assumed to have all the characteristics of the things abstracted from: 'You can't tell me anything about labor unions!'

[37] s.r., semantic reaction: The automatic emotional response of the animal sub-brain to words that overwhelms our capacity to properly evaluate experience and think out solutions.

Korzybski said that: "…identification represents a label for the semantic process of inappropriate evaluation on the unspeakable levels" which is pathological to Man, resulting in inferentially derived opinions and dogmas that hinder the human nervous system, produce infantile behavior, impede progress, and imperil survival." If we are not conscious of abstracting we must identify. Fido is incapable of consciousness of abstracting and has no choice. To Fido the object is all. For humans to behave like Fido is a tragedy yet the habit is deeply ingrained into us. It takes hard work to break the habit. Again, the Structural Differential represents a visual reminder that "This is *not* this."

Acquiring new habits is difficult and requires arduous practice. Achieving the silence of the objective level is not simple and requires much effort to attain. We must break habitual emotional response patterns. If the simple rules and conditions given in the present system for abolishing identification are followed persistently in the training with the Structural Differential, a complete and very beneficial structural and semantic change in the character and 'mental' capacities of a given individual occurs, seemingly all out of proportion with the simplicity of the training.

Looking at the Structural Differential, we observe that consciousness begins with sensation. Without getting into cognitive psychology and sensory anatomy, let me simply say that as we become aware of an object/event as it emerges from the background. We may see it, we may feel it, and/or we may hear it. But first there is sensation and then there is recognition. Already we have taken the fist step. As we emerge from the sense-less, undifferentiated, world of the womb, in a similar manner, representations of objects emerge from the sense-less state of non-consciousness. There is an incredibly marvelous threshold involved here and it is the one that begins to define humankind. The effect of the stimulus, Korzybski emphasized, is not the same thing as the stimulus itself. We have taken the first step in abstraction and consciousness of abstraction when we realize this.

The second quality of this emerging awareness is that we respond to only a part of the stimulus. We become conscious only of a select few of the possible universe of characteristics symbolized by the parabola. So far we are still at the unspeakable, objective level of our experience. Of very great importance, however, Korzybski stated in the strongest terms, this is exactly where our lives are lived – entirely on the objective level. This objective world is an interactive world between our nervous system and something outside of it.

If this level of awareness is hard to grasp, and it likely is for most people, Korzybski gave us a little help. "Pinch your finger," he said (ear lobe might work better). Now describe the sensation. "It hurts," "pain," or "painful," maybe even "ouch." Has the doctor ever asked you "Where does it hurt?" or "What do you feel?" This is the objective level of consciousness. Whatever we say about it, Korzybski stressed, the first order happening remains at the silent level. Pascal said of the emotions "The heart has its reasons which reason knows not," and another poet-philosopher whose name I have lost said that "The eye can see and never forget what the tongue can never speak." But poetry aside, sensation on the objective level has the effect of bringing us into existence and that existence, Korzybski noted, is now inside our skin. The lower centers now possess the raw material from which all meaningful and sublime statements are composed.

There are (among others) three things that occur below the verbal, at the unspeakable, level: 1) The occurrence of stimuli; 2) our organic response to it; and 3) our becoming conscious of it. Animals, to various degrees, share these qualities. Where they have better eyes, ears and noses, the object may be very vivid indeed. It is believed that the sensation a dog has to smell, which is thousands of times more powerful than in humans, is analogous to our own visual sense – very sharp, clear and detailed. But that is the end of it. The animal may recognize the object but does not assign it characteristics nor place a label on it. Humans both attribute characteristics to the object and assign a label--a word. We move to the verbal level and then on to abstraction and consciousness of abstraction, never forgetting, however, the non-verbal level and never forgetting that we have the tools to both better know the non-verbal level than our senses provide for, and better evaluate on the verbal level what we observe. General semantics can produce a correspondence between the macro and sub-microscopic realities.

Unless you understand the relationship between the verbal and non-verbal levels, general semanticist Wendell Johnson (*People in Quandaries*, 1946, p. 113) pointed out, you "risk straining the delicate connection between words and facts...". Observation, self-mastery, and consciousness of abstraction are required. Poor evaluation, a lack or limited consciousness of abstraction, is contrary to the well-being, if not the survival, of the human species. Consciousness of abstraction is essential to language. "Life becomes fuller and the individual ceases to act as a nuisance and a danger to himself and others," said Korzybski. Poor s.r., poor consciousness of abstraction, "… has a lasting effect on the [human] race." Children modeling their behavior after animals and after their parents, perpetuate this behavior. It leads to mental illness and maladjustment. The mentally ill are introverted and project reality into the world. With consciousness of abstraction, sensation comes first then ideas and, by implication, order, and sanity.

"Primitive" cultures, including those residing within industrial societies, blinkered by Aristotelian habits of evaluation, do not have a proper understanding of abstract ideas. Such understandings, including theories, themselves are abstract ideas. They lack a comprehension of the dimensions of time and of process and change. Such people do not progress. Such were the Greeks and such are many societies on the Earth today. And, given that human progress is more than advancement in technology and material comfort, we must ask if our own society represents true progress.

Once we have affixed labels (words) to objects, Korzybski reiterated, we begin to progress to higher levels of abstraction. "Lower order abstractions are manufactured by the lower nervous centers," Korzybski observed, and are "closer to and in direct contact with life experience, non-permanent, shifting, often intense, unspeakable, and very important in daily life. They cannot be communicated. The higher order abstractions are abstractions from the lower order abstractions, being further removed from the outside world, ... these are static, 'permanent,' and cannot be entirely eliminated from anyone." Unfortunately, we are largely unconscious of our first order experience.

Most of our communication, in advanced societies, is not words about objects but words about words (Intensional). We live our lives vicariously, distracted. It is in part due to our culture and the influence of Aristotelians and it is partly due to our lack of awareness. In this respect our "primitive" cousins have us badly beaten. What we most

admire about aboriginal life is that it is lived vividly, from moment to moment, with profound awareness of objective reality. "Modern" people have lost this vivid and immediate experience of life and many mistakenly seek to recapture some feeling of it through media stimulation, such as T. V. and computer games. This is a level of living that is also sought in certain esoteric schools out of the East that foster an intense awareness of the present moment. But such schools do not embrace a scientific, let alone a Non-Aristotelian, orientation. I can't help but think that Korzybski, in his own way, was pointing us back to this type of immediate daily living experience while at the same time keeping our very powerful rational capabilities completely intact.

If an engineer wished to develop a device for translating experience into a verbal representation, s/he would likely develop something very much as Korzybski did with the Structural Differential. Much work has been advanced in recent years on the subjects of visualization, diagramming, mind-mapping, affinity diagrams, hyper-text and even computer programs that sort ideas to try to establish linkages and develop structures from a loose collection of statements. Engineers employ drawings, blueprints and physical models and mockups. What they work with is the translation of lines between points, called drawings, into solidly formulated exact forms of engineering performance. They organize facts into structures. It is a highly creative and demanding activity. But engineers do not do well at the other end of the creative spectrum, attempting to translate physical objects and events of experience into the words that can be organized into the formulation of concepts which can be accurately communicated from one mind to another[38].

A lot of work has been done in cognitive psychology, for several generations in an effort to make children and adults better learners but, again, little work has been done in the area of the fundamental, or threshold, linguistic formulation or the job of getting from the experience to words. The entire corpus of Aristotelian education is based on a reliance on words: Starting with words and ending with words but not with the stage of cognition preceding words. Korzybski, I would suggest, is one of, if not the most important, founder of this area of linguistics and the Structural Differential represents an invention I believe of surpassing importance.

To make the Structural Differential more fully understood we will need a conscious knowledge of abstraction, but to make abstraction clearer it is useful to understand the structural aspects of the preliminary stages of translating experience into language. Let's pause for a moment to look at the difference between an object and an event. It is an important difference. It is a matter of persistence. An object has temporal stability. A brick is likely to remain a brick for a considerable length of time. An event, including our experience of a brick, however, is fleeting. Once it occurs it is gone for good. We have to take a mental snapshot of it, or otherwise record it. But events do tend to recur and as we work on these recurring episodes, like our tennis game, we develop some real feel for that class of events. We get better at recognizing them, understanding them and responding to them in real time. We learn to respond to them on the "unspeakable" level--without linguistic analysis, without words, and without conscious thought. In short, our brain becomes programmed to instantly recognize and respond to the occurrence of important

[38] You only have to consult technical handbooks to see how poorly technical minds communicate to those of us without a command of "geek."

events. With enough practice we attain a state of mastery – expert, skillful, deft, spontaneous, artistic – even elegance. This has been called "flow." Master craftsmen and artist work without verbalizing their skills. You don't want to have surgery by a doctor who must think about each step of the operation.

One of the tragedies of modern life is that we live our lives at such a hurried pace and with such a high degree of change and novelty that we rarely attain any great skill in any of the arts of living. Recent popular literature has suggested it takes 10,000 hours of practice to achieve mastery. If we are going to learn, we have to stop and smell the roses, and more, get to know a lot about rose bushes and soil and insects, etc. That is, in part, what the Structural Differential is about: Taking time to analyze and understand objects and events and our response to them.

There must be a certain degree of cooperation between our minds and physical reality for us to recognize an event or object. Something occurs. What is that? We begin by perceiving this thing through our senses – an incredibly complex process in its own right. There are five sensory systems but at least 20 different sensory modalities. Korzybski classified them into four kinds of senses: mechanical – touch; chemical – smell and taste; sound; and sight[39]. Sound and sight are by far the most important for us. Sound is the medium of natural language. Sight has been called the master sense. The eye is actually a part of the brain extending beyond the cranium. It is the sense most highly integrated with brain function. It is by far the most powerful and subtle of the human senses. Korzybski also considered it the most reliable.

He provided several examples that distinguish the sensory functions of sight and hearing, not to diminish one but to accentuate the other. For one, he noted that many people are good at memorizing verbally but without understanding. These people "know about" a lot of things but can't do them. For another he pointed out that auditory types are more detached from reality than visual types. He observed that the statement "I see," suggests a much greater level of comprehension than the statement "I hear you." He also noted that verbal propositions might be meaningful or meaningless – true or false.

He offered a simple exercise to demonstrate the power of the eye in understanding, and conversely the role of the brain in perception. The exercise involves a number of newspaper headlines of equal size. Show them to your subject at increasingly greater distances until they are just out of range to be read. When you reach that point, when the words are just a blur, then hold up a new headline and tell them what it's about and they will be able to see it. "Seeing is thus an aspect of understanding," he concluded.

Korzybski insisted that we train on the objective level by using objects. Referring again to perhaps his favorite object, the pencil. From the characteristics of the parabola of the Structural Differential, the universe of possible characteristics, the object links with just those required to describe it: Wood, eraser, lead, etc. To the object we attach a label 'pencil'; and then another that says: "an object to write with."

With the label we begin the process of verbalization and with verbalization we can move on to abstraction: Words about words rather than words about objects/experience. The characteristics we use vary according to the observer. How the object is perceived, the

[39] The foundation of NLP.

characteristics assigned to it, depends on the different perspectives of different observers. Each will perceive the object "pencil" uniquely. We use words, of course, but we must take care to use those that describe only physical structure.

Korzybski stressed the need for not only visualization but for the use of all the senses in learning: "...students," he said, "should not only hear and see the explanations but perform them for themselves, should handle the labels and indicate with their hands the different orders of abstraction." For me the tactile sense has always been important. From gardening to electronics to the martial arts, there are many objects and numerous tools and skills that are organized (structured) in such a way as to bring about a desired outcome, be it a harvest of vegetables or a sound synthesizer, a kata, or subduing an aggressor.

One should of course practice with the Structural Differential until the process becomes automatic, unconscious, and a reflex in its own right. But it is perhaps not so convenient to carry one in one's pocket or purse. It is, of course possible, to make a sketch, a diagram but my years at the workbench have taught me to fabricate my own ad hoc Structural Differential. I also use my desk or workbench as the "parabola," my universe, and objects on the desk as potential characteristics, frame out a space for my object and begin to organize characteristics. A handful of change and other objects from my pocket will also serve. I attempt to organize characteristics into a pattern that depicts the structure of the object/event and often attach labels that become the equivalent of variables or propositions. In this manner, what I begin with at the objective level becomes a plan of action, a procession from mere description to potential, that is a future state, a more desirable or improved state for the next manifestation of the object or event.

The Structural Differential is a "visualization set." An understanding of structure requires visualization, and training in visualization, Korzybski claimed, is the first step in eliminating identification. With proper visualization, identification does not occur. Requiring students to point to and handle objects and labels eliminates verbalization. Evaluation is thus correct. This has immediate benefits. It produces more efficient forms of thought. It shows us what a thing is actually doing. It goes beyond "know about" to knowing, or understanding. It makes us more conscious. It addresses all aspects of the nervous system and senses. It allows us to reach into the unspeakable level of experience.

Training with the Structural Differential eliminates the conflict between higher and lower centers and thus eliminates many mental difficulties. It allows us to make the transition from the old, Aristotelian, semantic reactions to the new and improved form of evaluation which eliminates identification. It encourages students to become more extroverted, more observant. It eliminates structurally false assumptions. It replaces the "is" of identity as the structural link between the objective and verbal levels. It adds to verbal statements the structure necessary to make them meaningful. The mentally ill, he noted, respond favorably to retraining in non-identification with the Structural Differential. For them it improves the affective response, the semantic reaction. It balances their internal world with the external world, reducing delusion. Semantic re-education makes many difficulties vanish. Verbal doctrine is robbed of its coercive power when the underlying structure is exposed.

ON NON-ARISTOTELIAN TRAINING

With Chapter XXIX of *Science and Sanity*, "On Non-Aristotelian Training," Korzybski again returned to the topic of training with the Structural Differential, by which he sought to demonstrate the foregoing theoretical considerations. "The main aim," he said, "is to acquire the coveted 'consciousness of abstracting,' on which non-delusional evaluation is based, and which becomes the foundation for non-pathological s.r. and sanity." There are two goals: 1) eliminate the 'allness[40]', and 2) reject the 'is' of identity. We thereby eliminate identification and impart a coherent stratification of 'human knowledge.'

Korzybski again made the point about the need to involve all the nervous centers in the training "so as to impart a permanent, lasting, and ingrained feeling of abstracting," that will "give us a kind of semantic co-ordinate system, in which we can represent any life situation or scientific situation, or any difficulty, with great clarity, and so evaluate them properly." It's not easy, he reminded us. We have to develop the reflex action involved in every art and in the laboratory. This requires a great deal of physical practice: not only listening to instruction but handling 'linguistic apparatus.' "A word can be heard, seen, spoken and written." Use of the Structural Differential involves all of the nervous functions. There are vital structural characteristics involved with each perceptual center.

Korzybski gave an example of his training a group of children. An adult, he noted, is trained in much the same manner, but with children the training is easier. To demonstrate the concept of allness he used an apple. He wrote down ("*This is vital,*" he emphasized) every characteristic the children came up with. The group was pushed to continue naming characteristics. When they could do no more he cut the apple for further examination. Then he brought out a microscope. The students came to understand that they cannot say all there is about the object apple. He used the kinesthetic centers by having the students touch and examine the unattached strings on the Structural Differential. A feeling for the process must be developed, he insisted. Then, "Having eliminated 'allness,' he turned to eliminating the 'is' of identity." The students were introduced to the words or labels and reminded that they are not the objects or feelings involved in the observation. He told them that we should all carry labels in our pocket. They must become as important in our consciousness as the other objects we carry. The children were told they cannot write with the word 'pencil' or drink the word 'milk.' Silence, he stressed, must always be observed on the objective level: "we stress the fact that we must handle, look and listen, never speak, but remain silent, outwardly as well as inwardly, in order to find ourselves on the objective level." We have to counter 'emotions,' 'preconceived ideas,' 'moods,' etc., going on inside our skin. The problem of evaluation and s.r. is "the fact that our actual lives are lived entirely on objective, un-speakable levels." The difference between description and inference was stressed and that the words employed depend on context.

After Science and Sanity

Throughout his life, in lectures and writings Korzybski continuously reiterated that proper training of the human nervous system involves the Structural Differential with which "we extensionally order semantic reactions, and train in 'silence on the objective level' (which includes 'pain,' 'pleasure,' all immediate 'feelings,' etc., in general immediate

[40] The conception that we perceive and know everything about the object/experience.

semantic reactions, which are not verbal), and this ordering introduces delay in reactions, and so automatically stimulates neurological 'inhibitions'." He strongly emphasized: "The Structural Differential is based on the semantic equivalence of non-identity and extensional ordering of semantic reactions." Animals cannot do this and when humans copy them they limit themselves to the simple and restricted realm of reality that defines animal existence, as it happens in much of human society. These patterns are passed on to children but proper training can readily break those patterns.

In a recorded lecture Korzybski told his students: "… we have an exact natural order of evaluation which, for the first time, can be conveyed with the aid of the Structural Differential by all available 'sense' organs, thus the ear, the eye, touch and kinesthetic 'sense,' so uniquely important in learning. Thus:

- Physico-chemical, electronic process, more important than:
- The 'object,' a nervous abstraction the brain, more important than;
- The verbal levels or descriptions, more important and reliable than:
- Inferences of lower order, more important and reliable than:
- Inferences of higher order, etc., etc.

Returning to the eye, and to relation, he said: "Every kind of relation can be formulated to your eye as a visual issue." Since the eye is part of the brain it has a direct impact on the function of the cortex and the brain. The Structural Differential is a visual aid.

"Many of my friends;" Korzybski related, "fancy that I am cranky about this Structural Differential, but some of my best students understand that for getting full benefit out of extensionalization[41] is impossible without actually playing with diagrams and charts like this. This is a fundamental point of extensionalization, because it affects the thalamus as well as the cortex. Everything goes through the thalamus, and so the eye." The Structural Differential is a static representation of a dynamic process. But the little dance of electrons never stops. From the event our nervous system builds the object using a selection of the possible array of characteristics (holes). There are holes without strings and holes with strings that do not connect to the object. These are the characteristics that are left out in the process of abstraction. "We visualize the natural order of evaluation," but we also handle the labels and strings. Shake the label. Move your hands. "That little wiggle really does the trick. It will help you." He called this "shake yourself," and said: "When you shake yourself in that ordered series of abstractions, you are inwardly ready to map a successful adjustment. When you see an object, a chair, for example, touch it. You have the secret of clarity, all of which is not verbal. It becomes organismal and kinesthetic. That is when you become stratified in four dimensions. You have added acuteness to your brain. You have engaged yourself organically into thinking, more than just using your 'brain.' Then you begin to orient yourself as-a-whole, which is non-elementalistic."

I will conclude this article with a note that the Structural Differential is available today only as a wall chart and that, clearly, is contrary to Korzybski's instructions to his students. I made a model of the Structural Differential, pictured above, from common

[41] Extensional Devices: Hyphens, quotation marks, indexes, dates, etcetera or etc., used overtly and tacitly to delay reactions and ensure extensional orientations.

wood. This is the only physical model of the SD of which I am aware. You can construct your own SD using cardboard, if you do not wish to do so in wood as I did, punching small holes into which you can insert threads (with the punch).

Chapter 5: Consciousness of Abstraction

When we think of an "abstract" thing we are likely to think of something ephemeral, metaphysical, even mystical. We may think of an abstract painting and our imagination may wander all the way to surrealism, cubism, Picasso. In short, it is a quality we feel but may not be able to put into words. We are thus unlikely to have a workable model of "abstract" to apply to ordinary language[42].

Abstract is when you aren't being concrete and realistic. "Abstract" is a multi-ordinal term. It has many meanings, many levels of meaning. This more readily illustrates what Korzybski called "confusing orders of abstraction." Korzybski talks about high-order abstractions – such as many of those alluded to above – and low-order abstractions. A low order abstraction occurs at near the objective level when we first attach a label. The process of abstraction is well underway by the time we put that label on the object. It is a long way from there to truly abstract concepts like "truth," "beauty," and "goodness." It is absolutely crucial that we comprehend the difference and gain a good appreciation of the full range of abstraction; to be conscious of the process and effect of abstract thinking. That is the goal of the present chapter.

Korzybski often stated that the central aim of his work was to bring about consciousness of abstracting. The statements "The map is not the territory," and "A word is not the thing it represents" are two ways of stating basic principles about abstracting. It is great to know some epistemology and it is neat to know about time binding, but to make language work, you need to know about and adopt an attitude of consciousness of abstracting. He quoted Whitehead: "A civilization which cannot burst through its current abstractions is doomed to sterility after a very limited period of progress." Korzybski amplified that by noting that the key to continued human evolution is a "general consciousness of abstracting" (1933, vii). "The moment we eliminate identification," he said, “we become conscious of abstracting, and permanently and instinctively remember that the object is not the event, that the label is not the object and that a statement about a statement is not the first statement" (1933, 420). The structural differential starts this process.

As always, Korzybski has a few choice words concerning the current state of affairs and the need of a new, non-Aristotelian system of evaluation. He wrote again about the difference between man and animal: Man is conscious of abstracting, animals are not. Animals are restricted to stimulus-response patterns, which in humans, when we do not employ consciousness of abstraction, leads to pathology. He reiterated that Aristotelian language, based on primitive language structure (subject-predicate, two-valued, ambiguous words) inherently confuses levels of abstraction. He takes another shot at some of his favorite villains – politicians and preachers – who seek to profit from that confusion, perhaps not deliberately but because they lack a consciousness of abstraction. Confusion of orders of abstraction, he asserted, have a neurophysiological effect – they impact colloidal states and disorganize the nervous system.

[42] Reader, please note that there is some redundancy in this chapter, needed to make this statement coherent.

How do we escape this dilemma? "Only an analysis of structure and semantic reactions, resulting in consciousness of abstracting, can free us from this unconscious copying of animals, which, let us repeat, must be pathological for man, because it eliminates a most vital regulating factor in human nervousness and s.r. (semantic reaction), and so vitiates the whole process" (1933, 37).

IN THE BEGINNING

Returning to the structural differential, we observe that consciousness begins through sensation. Without getting into cognitive psychology and sensory anatomy, let us simply remember that as we become aware of an object/event it emerges from the background. We may see it, we may feel it, and we may hear it. It may be external, or it may originate internally. But first there is sensation and then there is recognition.

Already we have taken the first step. As noted, as we emerge from the sense-less, undifferentiated, world of the womb, representations of objects emerge from the sense-less state of non-consciousness. There is an incredibly marvelous threshold involved here and it is the one that begins to define humankind.

The effect of the stimulus, Korzybski emphasized, is not the same thing as the stimulus itself. We have taken the first step in abstraction and consciousness of abstraction when we realize this. The second quality of this emerging awareness is that we respond to only a part of the stimulus. We become conscious only of a select few of the possible universe of characteristics symbolized by the parabola of the structural differential. So far, we are still at the unspeakable, objective level of our experience. Of very great importance, however, Korzybski stated in the strongest terms, this is exactly where our lives are lived – entirely on the objective level. But this objective world is also an interactive field between our nervous system and something outside of it.

Objects are abstractions: They are not the things they represent. Korzybski says that there are three levels of knowledge: 1) The submicroscopic, below the face of the watch, which is the domain of science; 2) The gross macroscopic level of daily experience of objects; and 3) the verbal level. He wrote: "...the nervous system is an abstracting, integrating mechanism" (1933, 310). The animal may recognize the object but does not assign it characteristics nor place a label on it. Humans both attribute characteristics to the object and assign a label – a word. We move to the verbal level and then on to abstraction and consciousness of abstraction. This is crucially important; never forgetting that we have the tools to both better know the non-verbal level than our senses provide for, and better evaluate on the verbal level what we observe.

General semantics can produce a correspondence between the macro and sub-microscopic realities. Unless you understand the relationship between the verbal and non-verbal level, Johnson pointed out, you "risk straining the delicate connection between words and facts..." (Johnson, 1946, 113). Observation, self-mastery, and consciousness of abstraction are required. Poor evaluation, a lack of, or limited consciousness of abstraction, is contrary to the well-being, if not the survival, of the human species. Consciousness of abstraction is essential to language. "Life becomes fuller and the individual ceases to act as a nuisance and a danger to himself and others" (1933, 527). Poor s.r., poor consciousness of abstraction, on the other hand has a "...lasting effect on the race." This is caused by

children modeling their behavior after animals and after their parents. It leads to mental illness and maladjustment. The mentally ill are introverted and project reality into the world. With consciousness of abstraction, sensation comes first then ideas" (1933, 169) and, by implication, order and sanity.

"Primitive" cultures, including those residing within industrial societies, blinkered by Aristotelian habits of evaluation, do not have a concept about abstract ideas. Such concepts themselves are abstract ideas. Lacking this consciousness of abstraction, verbs are timeless, present tense – demonstrating a lack of comprehension of the dimensions of time and of process and change. Such people, living on the earth or in the city, do not progress. Such were the Greeks, and such are many societies on the earth today. And, given that progress is more than advancement in technology and material comfort, we must ask if our own society represents true progress.

Once we have affixed labels (words) to objects, we begin the sequence of abstraction. "Lower order abstractions are manufactured by the lower nervous centers," Korzybski observed, "closer to and in direct contact with life experience, non-permanent, shifting, often intense, unspeakable, and very important in daily life. They cannot be communicated. The higher order abstractions are abstractions from the lower order abstractions, being further removed from the outside world, ... these are static, 'permanent,' and cannot be entirely eliminated from anyone" (1933, 297).

Unfortunately, we are largely unconscious of our first order experience. Most of our communication, in advanced societies, is not words about objects but words about words. We live our lives vicariously, distracted. It is in part due to our culture and the influence of aristotelianism and it is partly due to our lack of awareness. In this respect our "primitive" cousins have us badly beaten. What we most admire about aboriginal life is that it is lived vividly, from moment to moment, with profound awareness of objective reality. "Modern" people have escaped this vivid and immediate experience of life and seek to recapture some feeling of it through media stimulation, for example, T. V. and computer games. I can't help but think that Korzybski, in his own way, is pointing us back to this type of daily living experience while at the same time keeping our very powerful rational capabilities completely intact. This is a level of living that is found in certain esoteric schools such as Gurdjieff, Zen, Sufi and certain yogas, all out of the East and recently introduced into the West—which foster an intense awareness of the present moment.

ABSTRACTION

Abstraction is the high country of the mind. This conceptual high ground is where human essence takes form. Once we realize it is not the world itself, we are able to act out our creative potential to the full. We build structural relationships, our internal representations of the world, not in low order sensations and emotions but in high order language. We must have words to have language, but we have to know what we are talking about if language is to make any sense. That capacity comes with higher order concepts with consciousness of abstraction. Our very capacity for consciousness depends on our nervous system’s capacity to abstract and visualize on an abstract level. Abstraction allows us to not only communicate but to attain an enormous economy in action.

Abstraction proceeds from lower to higher levels one level at a time. It is anchored in experience in the lower centers. In the higher centers it becomes memory, imagination, language, self-consciousness, etc. Low order abstraction may consist of words about experience – labels. Higher order abstractions consist of words about words – labels on labels. The conscious mind is thus removed from immediate experience. As we achieve higher and higher orders of abstraction, we include more experience, but we lose detail. However, we gain much from our loss. Korzybski mused: "...facts, ...facts, ...facts – let me summarize." You don't need all the facts. We analyze, summarize, then we may generalize. Consciousness of abstraction is just that awareness that we have left something out – the awareness that higher order abstractions have only a second-handed connection to the world of experience. Here lies the danger. We must ponder how many words, of what level of abstraction, it takes to make us clear.

Higher order abstraction allows us to communicate an impression of experience from one nervous system to another. High order abstractions make time-binding possible: They make it possible to store and transmit knowledge in extra-neural forms (writings and recordings). Knowledge begins with low order experience but the unspeakable cannot be communicated and our object level labels permit little more than indication of things held in common experience. With high order abstraction we can not only preserve and communicate experience, but we can expand our rational capabilities: many minds can bear on the evaluation of the data of one source, or many sources. Progress is rapid, Korzybski observed, only with higher order abstractions. The higher the level of abstraction, given proper consciousness of evaluation, the more rapid our collective progress.

We begin to jump toward extensionalization when we notice some structural characteristics of the process of abstraction. Korzybski reminded us again: "because the objective levels are not words, the only possibility of science is to discover structure..." (1933, 29). The order of abstraction, from lower to higher, from the unspeakable, to label, to summary, to generalization, etc., is natural. It is part of us. Structure is natural: It is found everywhere. The emergence of higher order organisms is all around us and we are, of course, a part of that process. As human culture has evolved our knowledge has become structurally stratified by orders of abstraction. The structural differential models this process.

Let’s begin with a fundamental structural relationship: Space-time. Time gives us a sense of structure, but it does not exist as an independent quality. Space doesn't exist by itself either. Space is a function of distance, distance a function of velocity and velocity a function of time. Time itself is finite. We are used to thinking in three-dimensional, spatial, concepts, but time is much more important than distance for everything is organized in a before-after sequence. We speak a great deal about "function" in mathematics, e.g., $y=f(x)$, that is, y is a function of x. Such a statement is more than a simple function. It is a propositional function. It is a relationship between two or more magnitudes. To have a proposition you must have a relationship. Such relationships are typically asymmetrical: greater than, lesser than, before, after, higher, lower. It may have a vertical dimension (man and animal) or horizontal dimension (gold, silver, platinum). Structure may consist of no more than a change in frequency. Propositions say something about how things actually

are. Of greater importance, when you make a statement (proposition) about reality you make a statement that is testable.

"One of the most marked structural characteristics of the empirical world," Korzybski observed, "is 'change,' 'motion,' 'waves,' and similar dynamic relationships" (1933, 284). Structural words suggest sequence, e.g., 'implies,' 'follows,' 'becomes,' 'evolves,' 'results,' etc. If you understand the structure of time sequence (and probability) you may attain the power of prediction: $time_1$, $time_2$, ... $time_n$.

One of the implications of structure is classification. In leaving out details we begin to notice similarities in things and can group them into classes of objects/events. But abstractions are non-identical and non-elemental. We may think "who he is" defines his class but an individual belongs to many classes: gender, race, religion, nationality, time, beliefs, the acts he/she is known for.

Bertrand Russell, speaking of the theory of types, said that whatever contains all of a collection of things is not one of them. It is a higher order abstraction – a statement about a class of things. But just how identical are things in that class? Korzybski quoted E. T. Bell about "that wretched monosyllable 'all'." "One of the most pernicious habits which we have acquired emotionally from the old language is the feeling of allness, of concreteness, in connection with the 'is' of identity and elementalism" (1933, 379). Whitehead called it the "fallacy of misplaced concreteness" – a neglect of a consciousness of the degree of abstraction. Korzybski continued: "There is natural resistance/persistence of older s.r. First, we have to remove 'allness' and 'concreteness' – both structurally unjustified – identity, absolutism, dogmatism and other s.r." (1933, 379).

At the objective level each individual, each object, each event, is absolutely unique. We tend to lose sight of the uniqueness. That uniqueness never actually disappears, we merely lose consciousness of it as we lose consciousness of abstraction. Korzybski continually stressed that uniqueness and that all higher order abstractions are statements of probability. We can never say everything about anything, and we need to be mindful of the inherent diversity in virtually any class of objects/events. He gives the example of a box of matches – each match is individual, each piece of popcorn is unique, each snowflake is unique, etc. From modern genetics we learn that the variation between the members of a species or a race and another, can be greater than the variation that defines the difference between those species or races. When we read the surface of a thing, we still have not seen its inner composition. Our watch, for example, may be digital or mechanical. When we look at a thing from one angle, we see it differently than from another angle. When we buy a car, are they the same or do we still kick the tires? We can trace differences down to the microscopic level.

There is adequate potential for considerable semantic confusion arising from low order abstractions, Korzybski noted. We can see it in a question like: "What is the actual value of a dollar?" An abstraction is a headline. It tells us about the category of thought it contains but it leaves a lot of particulars out. An abstraction leaves many "unused or undefined characteristics" (1933, 410). Hayakawa illustrates this with a description of Bessie the Cow: Bessie the cow is "A living organism, food, air and water in – and out – constantly changing, blood circulating, nerves firing, muscle, bone, cells, bacteria, a

perpetual dance of electrons" (Hayakawa, 1964[43], 177). Bessie is never completely described and by no means a static object. Johnson observed: "It is absolutely certain that there is nothing certain... This statement of certainty is, however, a statement about a statement (levels of abstraction): It does not refer to reality..." (Johnson, 1946, 186). Korzybski quotes Einstein concerning certainty and mathematics: "As far as the laws of mathematics refer to reality, they are uncertain and as far as the are certain, they do not refer to reality" (1933, 67). Wittgenstein told us that a description that defines a class of objects might tell us nothing about the individual objects.

What happens when we misuse abstractions? In the simplest terms, just about every bad thing we can imagine, from stress to insanity to crime to war. Higher order abstractions produce vague thoughts, resulting in unsubstantiated opinions, causing irresolvable conflict. Higher order abstractions have a psycho-neural effect on the nervous system. They affect colloidal states (nervous function) in the cells. They deeply affect the lower centers. They produce the effects Korzybski called identification, disturbances in evaluation, confusion of orders of abstractions, objectification, delusions regarding values and meaning, etc. In short, they cause mental dysfunction including insanity.

Words can be divided into two categories: descriptive words and inferential words: The names of things on the unspeakable level and relational terms which at one level speak directly to experience and at another provide words which are used to talk about these first level experiences. Science employs both description and inference: Descriptive observation and generalizations about them. The true power of science is that it develops language that links each level of abstraction in a carefully arranged pattern for the specific purpose that the chain of abstraction is exactly preserved.

Science begins with the subtlest levels of experience – things that not only escape our attention but may also be far beyond the range of our senses. Science, Korzybski noted, is a joint effort and scientific theories and laws are a collective product. Science is founded on collective experience, of definition, of classification and of constructing structural statements (often in mathematics) that give it a shared meaning. Einstein may have discovered and articulated the theory of relativity but any causal reading of the history of science will clearly demonstrate that he worked within a milieu of like-minded scientist and sought not so much to do something heretofore unimagined but to travel an indicated direction to open a new door to understanding. Had he not succeeded someone else would have, perhaps Bohm, Feynman or Hawking or any of a hundred other brilliant twentieth century scientists. The history of science illustrates the fact of not a few simultaneous discoveries.

Hayakawa observed that: "When a scientist 'understands' he has "ordered his observations at the objective, descriptive, and higher inferential levels of abstraction into a workable system in which all levels are related to other levels in terms of a few, powerful, generalizations" (Hayakawa, 1964, 154). He noted that this power is available to religious leaders, to philosophers and to novelists should they choose to employ it. By weaving levels of abstraction together we get coherence and successful integration of human experience. Like a woven rug, the warp of principles threaded by the woof of experience,

[43] S. I. Hayakawa, Language in Thought and Action, 1964

produces a final coherent structure. Johnson said it this way: "Our ultimate understanding of life and reality, ... , is basically in terms of the inferential process by which we strive to account for first order facts" (Johnson, 1946, 107) and, he continued, "The degree to which communication occurs depends precisely upon the degree to which the words represent the same thing for the listener that they do for the speaker. ... Until we reach agreement as to precisely what a person is talking about, we cannot possibly reach agreement to whether or in what degree his statements are true" (1946, 51).

In short, there are a lot of definitions in science. Charlotte Read (1984, 67[44]) said: "Humans, ... , are not only able to abstract on indefinitely many higher orders in their generalizing, inferring, etc., but can know that they do so, can build theories and test them in practice, write books, can 'think about thinking, etc. – important benefits for economy and simplicity in building theories, and for the transmission of knowledge. They may also be dangerous if not checked with 'facts' or related to consequences. Inferential knowledge, when consciously accepted as inferential, forms the hypothetical knowledge of modern science and ceases to be a dogma."

What it boils down to, Korzybski said, is that we can use higher order abstractions to evaluate immediate experience and thereby test the higher order abstraction. This is the process of verification, of testing. In final analysis, however, the language of science is mathematics. The expression "1 + 1 = 2," Korzybski illustrated, is strictly structural. It has nothing to do with content. It can be about apples or dollars or stars. Math has no physical content, nor, says Arthur Eddington, does knowledge. Eddington called knowledge "an empty shell – of structure not content." (Korzybski, 1950, 202[45])

What do we gain by using appropriate consciousness of abstraction? First, we attain 'mental health.' It joins thinking and feeling in a balanced manner and helps us translate between orders of abstraction. "Once we learn to differentiate between orders of abstraction," Korzybski stressed, "identification disappears" (1933, 468). We become introverted extroverts, we become "balanced, adapted adults," we attain "semantic flexibility," etc.

The rule of general semantics is "don't confuse orders of abstraction" (1933, 432). That could be an eleventh commandment. "… we must find means," Korzybski continued, "by which high order abstractions can be translated physiologically, into lower abstractions uniquely connected with the translation of the dynamic into the static and vice-versa" (1933, 304)

Consciousness of abstraction is not automatic: we don't come equipped with this skill, it doesn't come easily, and it is always a deliberate effort. We must continually work with it and attempt to develop a mastery of it. We must work to learn how to translate higher order abstractions into lower order abstractions. As Johnson put it: "A human reaction, regarded as a technique, is, therefore, to be evaluated with reference to what it accomplishes, the efficiency with which it accomplishes it, and the consequence of the accomplishment" (Johnson, 1946, 226). This has been called operationalization. Johnson provided an illustration of the difference between what we can operationalize and what we

[44] Mary Morian, Editor, Bridging World Through General Semantics, 1984
[45] Alfred Korzybski, *Manhood of Humanity* (Second Edition), 1950

cannot: "What is the difference between plogglies and electrons? You can't see either one. Both are imaginary constructs. The difference is that we are acutely conscious of 'electrons' as an abstract construct but not certain at all about what 'human nature,' or plogglies, is – it is unevaluated, undefined, undifferentiated, projections" (1946, 80).

In final analysis what we are talking about isn't just technique and awareness, it is genius. "Genius," Korzybski reflected, "readily translates high order to low order and low order to high order abstraction – due to structural knowledge" (1933, 455).

Chapter 6: Higher Order Abstractions

Korzybski opened his *Science and Sanity* chapter on "Higher Order Abstractions" by reminding his readers that he has introduced "a short-cut which enables us to grasp, acquire, and apply what has been advanced in the present work. That shortcut is consciousness of abstraction, "a psycho-logical attitude towards all our abstracting on all levels and so involves the co-ordinated working of the organism-as-a-whole." He reiterated that the work of the structural differential, which begins with the un-speakable level: "We can see them, handle them, feel them, but under *no* circumstances can we reach those levels by speech alone." Once this habit is established, with the lower order levels of abstraction, "no one should have difficulties in extending the non-identity method to daily-life occurrences." He stressed again that each level of progress from the event to the object to the label leaves characteristics out: that there are strings hanging from the previous level that are not used. By handling the hanging strings, by looking at them, 'he' increases the probability that the organism-as-a-whole is affected. And again, this process extends as well to the higher levels of abstraction.

Abstraction involves statements about statements. A class of events consists of a large number of individuals. By disregarding all characteristics that are unique to the individual we are left with a 'general' name, the name of that class of individuals. What Korzybski did with consciousness of abstraction was, first, to employ the Theory of Mathematical Type developed by Whitehead and Russell, and then go beyond it to devise a framework which included and expanded that theory. This theory allowed Whitehead and Russell to overcome the endless paradoxes and self-contradictions in mathematics that would make the subject impossible.

The difficulty lay in the term "all" (to which Korzybski referred in a quote at the beginning of Chapter XXIX by E. T. Bell: "That wretched monosyllable 'all' has caused mathematicians more trouble than all the rest of the dictionary.") Russell called "all" statements 'illegitimate totalities.' The solution, presented in *Principia Mathematica*, was: "Whatever involves all of a collection must not be one of the collection," or, in Korzybski's words: "Before we can make any statement about 'all propositions' legitimate, we must limit it in some way so that a statement about this totality must fall outside this totality".

Korzybski said that there was no need to further elaborate the theory of types but in Supplement II of his book he included an article by Paul Weiss, entitled "The Theory of Types." Weiss had studied with Whitehead at Harvard (Ph.D. 1929). In 1928 he wrote a critique of the theory of types in the *Principia* that was accepted by Whitehead as legitimate. Perhaps the most important conclusion Weiss reached was that the theory of types had limited application, a point that must have suited Korzybski when he said "The author was pleasantly surprised to find that after his Ā-system was formulated, this simple and natural, actional, functional, operational, non-el theory covers the theory of mathematical types and generalizes it, making the theory applicable not only to the solution of mathematical paradoxes but to the solution of the majority of purely human and scientific difficulties."

The theory of types "saved" mathematics but "has no application to life." Korzybski made the theory of types applicable to life. He drew three statements from the *Principia*

and briefly "reformulated them in my language of *orders of abstractions* and shall designate them as general semantics (G. S.)."

1. "Objects as individuals and 'collections of objects' obviously belong to different orders of abstraction and should not be confused.
2. "'Propositions about all propositions' represents a higher order abstraction.
3. "A set of statements or objects or elements, or the like, and a statement about them belong to different orders of abstractions and should not be confused.

Korzybski further observed that the language of the *Principia* is itself Aristotelian and involves the 'is' of identity, or identification. With this observation he proceeded to a discussion of multiordinal terms, which, he noted, he discovered and formulated in 1925.

MULTIORDINALITY

Korzybski began his discussion of multiordinality, in his chapter XXVII, with terms like "vaguely," "interesting," "inherent in the structure of human knowledge"; and "in general infinite-valued and ambiguous." He wrote: "The multiordinality of terms is the fundamental mechanism of the [full conditionality] of human semantic reactions; it eliminates an unbelievable number of old animalistic blockages, and it is fundamental for sanity".

Multiordinality is an idea that apparently was not discovered until late in Korzybski's research. "I suspect," he stated, "that without the discovery of the multiordinality of terms the present work could not have been written, as I needed a more flexible language, a larger vocabulary and yet I had to avoid confusion." He added: "multiordinality is the most valuable term we have." But last is by no means least.

Multiordinal (m. o.) terms have different meanings at different levels of abstraction. There is a test for multiordinality: First, if a term about a given statement applies to it, and we make a statement about that statement, will it continue to apply, etc.? "If so, it is a safe assertion that this term should be considered as *m.o*." The underlying quality of the *m.o* term is that it is ambiguous and context specific. Confusion of orders of abstraction consists of setting a fixed, 'literal,' and permanent, i.e., doctrinal value, on the term. A m.o. term can have no general meaning. Korzybski listed seven semantic benefits of multiordinality:

1. "We gain an enormous economy of 'time' and effort, as we stop 'the hunting of the snark,' usually called 'philosophy,' or for a one-valued general definition of a *m.o* term, which would not be formulated in other *m.o*. terms;
2. We acquire great versatility in expression, as our most important vocabulary consists of *m.o*. terms, which can be extended indefinitely by assigning many different orders and, therefore, meanings;
3. We recognize that a definition of a *m.o* term must, by necessity, represent not a proposition but a propositional function involving variables;
4. We do not need to bother much about formal definitions of a *m.o* term outside of mathematics, but may use the term freely, realizing that its unique, in principle, meaning in a given context is structurally indicated by the context;

5. Under such structural conditions, the freedom of the writer or speaker becomes very much accentuated; his vocabulary consists potentially of infinite numbers of words, and psycho-logical, semantic blockages are eliminated;
6. He knows that a reader who understand that ∞-valued mechanism will never be confused as to the meaning intended; and
7. The whole linguistic process becomes extremely flexible, yet it preserves its essential extensional one-valued character, in a given case."

Korzybski added that poetry, which makes much use of *m.o* terms, "often conveys in a few sentences more of lasting values than a whole volume of scientific analysis."

The word "abstraction" itself is a multiordinal term. What it means depends on the level of abstraction and upon the structure of events. It is a matter of both structure and function. The terms "structure" and "function" are themselves multiordinal. They have many meanings. They have no general meaning apart from context. But they may be very specific within a context as long as the rest of the rules of general semantics are followed. Because we don't really understand the process of structure we often turn to function for understanding. "Know" and "understand" are multiordinal terms. So are "yes," "no," "true," "false," "property," "relation," "number," etc. Multiordinal terms are multi-valued.

Korzybski stressed that full mastery of the mechanism of multiordinality "leads automatically to a possibility of complete psychophysiological adjustment." If we are conscious of abstraction and acutely aware of our use of higher order abstraction and the chain employed between the higher order terms and the unspeakable level of experience, we attain both an advanced state of conscious awareness and a significant control over semantic reaction. There is no limit to the human capacity to abstract. When we remove the emotional stops, we can continue as far as we are capable of staying connected with reality.

Mathematics is structurally multiordinal. Korzybski believed that "When 'logic' becomes an infinite-valued 'structural calculus,' then mathematics and logic will merge completely and become a general science of m.o. relationships." If we remain inexact in our language habits this cannot occur. We begin to make progress through the development of a language of relationship, or structure, employing concepts developed by these pioneering studies which do attempt to apply and develop a mathematics, or calculus of human discourse. He cited certain pioneers in linguistic analysis such as Russell, Whitehead and his friend Keyser, who made important contributions.

Let us look at the sequence of abstraction. With each level of abstraction information about the objective level is lost and, Korzybski continues, "Not only do the number of m.o. characteristics differ, but also the character of the abstractions differs from level to level of successive abstraction". Again, consciousness of abstractions is no more than the awareness that we have left things out. This process, he reiterated, is observed with the structural differential.

We might be inclined to avoid something as difficult as multiordinality, but, Korzybski said, avoidance of m.o. terms is impossible and undesirable. We need only remain aware that when a term is ambiguous, unclear, it is multiordinal. At some context, and in that context alone, it will be perfectly clear. We need only find the right context. An

example that comes to my mind is the term computer bug. In the world of computers, we find a language, a jargon, or technical terms, which tend to have very specific definitions. A "bug" is widely known as a computer problem. It can occur at many levels: hardware, software, program or application logic, communications, etc. What is a bug for a programmer is quite different from a bug for a hardware or telecommunication technician. But why is it a bug? Does it have anything to do with computer viruses – I mean, aren't viruses' bugs (microorganisms) in medical slang? Yes, for doctors. No in computers. The word "bug" was coined, as described elsewhere, by Admiral Grace Hopper. One day, early in her career, and the history of computers, she discovered a moth caught in a computer relay. She tapped the moth in the logbook with the notation "Bug found in computer." This story serves precisely to illustrate what Korzybski is talking about with multiordinality: An objective level phenomenon that has undergone a number of degrees of abstraction.

The term "computer virus," I might note, was taken from a medical analogy. Computer viruses attach themselves to certain forms of computer programs, replicate themselves, spread by "contagion" and cause serious internal disruptions, even destruction (mortality) of infected systems. There was a term called "safe computing" which refers to the control of the spread of these viruses by use of "prophylactic" devices. More recently we find the concept of "viruses of the mind," or memes, which also takes on a hereditary connotation from "gene." Korzybski wrote about this phenomenon a half century before it was popularized.

Failure of consciousness of abstraction and mastery of multiordinality has an effect not unlike a computer virus. The result is serious disturbances of the brain and the body's neurophysiology. These effects can be "delusion, illusion, and hallucination" resulting in severe mental illness. Unconsciousness of abstraction can also produce a wide array of physical, psychosomatic, diseases, some life-threatening. All these effects are caused by nothing but words, or more specifically, improper understanding of words. When we fail to recognize the multiordinality of terms, such as 'true' and 'false,' we get false beliefs and false doctrines. Such false doctrines have contributed to massive destruction and loss of life.

Multiordinality terms have meaning. What they do not have is a general meaning. Our job is no more than to recognize this fact – in short, to avoid identification. What is the payback for proper use of multiordinality? Korzybski listed seven benefits:

1) Multiordinality gains us a tremendous economy of time and effort;
2) it promotes greater versatility in expression;
3) we recognize that a m.o. term is not a proposition--which can be tested, but a propositional function--which is a non-testable statement about a class of testable propositions;
4) we can use it much less formally than required by mathematics;
5) by eliminating semantic blockages it vastly expands our working vocabulary;
6) those who understand infinite-valued multiordinality avoid confusion regarding intended meanings; and
7) the linguistic process becomes much more flexible.

ADVANCES IN LANGUAGE USAGE

The basic function of language has not changed since humans, many thousands of years ago, first started talking. Language applies to the immediacy of our lives. With the rise of civilization, life became increasingly complex and abstract. New habits became embedded in our linguistic structures. With the advances of science, circa 1933, it becomes clear that "We must revise the whole linguistic procedure and structure, and gain the means by which to disclose the structure (structural stratification) of 'human knowledge'" which is mandated by the current demand for proper and adequate function of the human neurological structure, i.e., sanity. With a consciousness of orders of abstraction, it is structurally possible for 'man' to abstract an indefinite number of orders and to successfully employ this capacity for personal adjustment and the progress of the race. "The whole subject of our human capacity for higher abstracting without discernible limits appears extremely broad, novel, and unanalyzed. It will take many years and volumes to work it out," Korzybski said, adding, that this "will be only suggestive [of] the enormous power of the Ā methods and structure, aiming to make them workable as educational, powerful, semantic devices."

In the final section of Chapter XXVII, Korzybski discussed in more detail the matter of confusion of higher orders of abstractions. Our culture teaches us to disregard the orders of abstraction making us "nearly helpless and hopeless semantic victims of a primitive-made language and its underlying structural metaphysics. He observed that by working with the structural differential, we train the s.r. to facilitate the passing to higher orders of abstractions. He continued, "non-identity leads to 'consciousness of abstracting' and gives us a new working sense for *values*, new s.r. to guide us in the verbal labyrinth."

He illustrated the difference by diagramming the habits of the ideal observer and one ignorant of orders of abstraction. Both have made a series of observations and drawn conclusions from them. Both then make a new observation. Korzybski's ideal observer adds the new experiences to the old and draws a new inference or conclusion. The ignorant observer applies the conclusion of the first series of observations, making the new observation in effect a function of that conclusion. He learns nothing new. This is the psychological, and neurotic, process of projection. One of the consequences is the prevalent habit of labeling people, a process we call today stereotyping. Part of the process is the long-standing fallacy of "begging the question:" which is the self-deceptive process of asking a question that assumes the answer. He gave examples like 'un-patriotic,' 'un-Christian,' and 'un-American,' etc. This labeling is toxic to the social and political body of the nation. We can all provide long lists of examples.

Such behavior does not promote the survival of society. It causes great and unnecessary suffering. It results in mental illness and insanity. The majority of people we deal with in daily life are deeply affected by these semantic toxins. The solution is simple, albeit laborious, and that is training in non-identity, using the structural differential, and persisting in acquiring new habits of evaluation and behaviors.

IDENTIFICATION AND VISUALIZATION

In Chapter XXVIII "ON THE MECHANISM OF IDENTIFICATION AND VISUALIZATION," Korzybski again addressed the process of visualization, "one of the most

beneficial and efficient forms of human 'thought.'" He found it necessary to distinguish between '*mech*anistic' and *mach*inistic," a point he observed that a majority of philosophers miss. Mechanics is a science that deals with "dynamic manifestations on all levels," macroscopic, microscopic, and sub-microscopic, down to the quantum level. A machine is a device constructed to perform a single and fixed function. Since Newton it has been common to see the universe as a machine with a fixed, deterministic, and predictable operation. This is a crude picture of the universe. The universe of 1933 is the dynamic process defined in the science of mechanics. It more accurately represents the structure of reality which must be apprehended if humanity sanity is to obtain.

We discover structure through "*visualization*, imagining, picturing, [etc.]" The lower centers can deal only with the concrete. The higher centers produce theories that are often difficult to visualize. The quality of true genius is the possession of a nervous system that can translate higher order abstractions ('intuitions,' 'orientations, ''visualization') "into lower and vice versa." They have "a non-el system based on structure, visualization, etc., which can be translated simply, easily, and efficiently into the terms of the lower centers. These problems are of educational importance and should be worked out more fully." It is further, a reflex action, much as driving a car, playing a piano, or typing. These reflexes are achieved through training. "In *visualization*, identification does not occur; orders of abstractions are not confused; semantic disturbances do not appear; the *evaluation is correct*; a 'picture' is evaluated as a picture and not as the events [etc.]. In other words, because of the consciousness of abstracting, the natural order of evaluation is preserved."

Not all people visualize well. Pavlov, indeed, demonstrated that "visual stimuli are physiologically weaker than the auditory ones." In 'man' they should be stronger. The division between 'visual' and 'auditory' types, he observed, "is not sharp." As abstractions tend to be verbal, auditory types "enmeshed in words…cannot be equally well adjusted." The human ear is less subtle and effective than the human eye. The human eye is an extension of the brain itself. Auditory types are relatively poor observers and thus less well adjusted, less adaptable, and more prone to infantilism. They tend to be more detached than visual types. "In daily life we never say 'I hear' when we wish to convey that we understand; but we say 'I see.' When we say 'I hear what you say,' we usually wish to convey that we have heard something which we did not fully grasp or approve."

ON NON-ARISTOTELIAN TRAINING

With Chapter XXIX, "ON NON-ARISTOTELIAN TRAINING," Korzybski again returned to the topic of training with the Structural Differential, by which he sought to demonstrate the foregoing theoretical considerations. "The main aim is to acquire the coveted 'consciousness of abstracting,' on which non-delusional evaluation is based, and which becomes the foundation for non-pathological s.r. and sanity." There are two goals:

1) eliminate the 'allness', and
2) reject the 'is' of identity.

We thereby eliminate identification and impart a coherent stratification of 'human knowledge.'

Korzybski made a strong point about the need to involve all the nervous centers in the training "so as to impart a permanent, lasting, and ingrained feeling of abstracting," that will "give us a kind of semantic co-ordinate system, in which we can represent any life situation or scientific situation, or any difficulty, with great clarity, and so evaluate them properly." It's not easy, he reminded us. We must develop the reflex action involved in every art and in the laboratory. This requires a great deal of physical practice: not only listening to instruction but handling 'linguistic apparatus.' "A word can be heard, seen, spoken and written." Use of the Structural Differential involves all the nervous functions. There are vital structural characteristics involved with each perceptual center.

Korzybski used as his example of training a group of children. An adult, he noted, is trained in much the same manner, but with children the training is easier. To demonstrate the concept of allness he used an apple. He wrote down ("*This is vital*") every characteristic the children came up with. The group was pushed to continue naming characteristics. When they could do no more, he cut the apple for further examination. After further examination he then brought out a microscope. The students came to understand that they cannot say all there is about the object apple. He used the kinesthetic centers by having the students touch and examine the unattached strings on the structural differential. A feeling for the process must be developed, he insisted. Then, "Having eliminated 'allness,' we begin to eliminate the 'is' of identity." The students were introduced to the words or labels and reminded that they are not the objects or feelings involved in the observation. He said that we should all carry structural differential labels in our pocket. They must become as important in our consciousness as the other objects we carry.

The children were told they cannot write with the word 'pencil' or drink the word 'milk.' Silence, he noted, must always be observed on the objective level: "we stress the fact that we must handle, look and listen, never speak, but remain silent, outwardly as well as inwardly, in order to find ourselves on the objective level." We must counter 'emotions,' 'preconceived ideas, 'moods,' etc., going on inside our skin. The problem of evaluation and s.r. is "the fact that our actual lives are lived entirely on objective, un-speakable levels." The difference between description and inference was stressed and that the words employed depend on context.

Wrong evaluation comes out of the overuse of the lower, emotional, nervous centers. We are consumed by worries, fears, and discouragements. The elimination of the 'is' of identity opens the higher orders of abstraction to us. Emotions are not suppressed but may be sublimated. "Intelligence requires the passing from level to level in both directions." Korzybski observed that the difference between high and low intelligence is the scope of outlook. High intelligence has a very broad scope, knows more about the past and can look further into the future. The intelligent have a modern structural metaphysics found in science, 1933.

Popularized science, he reiterated, is usually written in the inadequate, primitive, language of daily life. We thus can never be free of structural assumptions. Our choice is to choose the modern, Ā, structural assumptions. That structure embraces the higher levels of abstraction that are not available to animals and people wrapped in the habits of primitive languages. The 'unspeakable' does not mean the unknowable. It is merely the beginning of knowledge for those who understand it. We learn to observe on the silent,

objective level and realize that it is a resource from which an inexhaustible structure of human knowledge can be built. Korzybski personally practiced by sitting silently, observing things going on.

The highly intelligent person never takes a statement for granted. S/he will investigate. S/he will ask: "What do you mean?" This does not imply that the average 'man' does not think, but without proper training they cannot think clearly. "When we become more civilized and enlightened, no public speaker or writer will be allowed to operate publicly without demonstrating first that he knows the structure and semantic functioning of the linguistic capacities." It is not a suppression of free speech but a condition for a progressive, "*scientifically enlightened society*."

This should require an examination. We are required to take an examination for a driver's license or pilot's license or a license to practice many professions, trades, and crafts. We should let professional scientific bodies guide us in the development of standards and perfection of "linguistic structural examinations." Obviously tremendous reforms are required in schools, colleges, government, and other institutions. Once the reflex-activities have been acquired we may expect great improvements in the enjoyment and satisfaction of daily life. We may expect dramatic improvements in character, in morality and ethics, in scientific, economic, and social progress.

To this end Korzybski said he had written a textbook "for parents, teachers, physicians, and workers in 'mental' hygiene, and for future students and research workers in psychophysiology and semantic hygiene." Elementary school teachers begin the work. Young students will require an hour a day until proper habits are acquired and one hour a week afterwards. In high schools, colleges and universities, special instructors and more extensive programs of training are required. Scholarship will improve. Teachers will discover new means and methods for teaching their subjects. A much greater economy of effort should result.

MORE THAN THOUGHT ALONE

Evaluation in general semantics goes beyond mere thinking and calculating. It is a holistic response of the human organism to stimuli. It involves the outer environment and internal experiential and emotional states. General semantics attempts, Korzybski said, to work out a "theory of evaluation which is based on the optimum electro-colloidal action and reaction of the nervous system – which brings about cortico-thalamic integration." With general semantics we begin to assess not only the validity and accuracy of our communication but go to the very roots of consciousness and sanity as well. Bois wrote that: "The general purpose is to liberate ourselves from preconceived ideas, hidden assumptions, and rigid ways of thinking." In this manner we evolve our capacity to evaluate from primitive-pre-industrial consciousness to the classical-mechanical model, and now beyond that to the level of null-A psycho-logic.

A great deal of emphasis must be given to the relationship between person and environment. We live in not only a natural environment but a semantic one as well. Human actions, unlike those of animals, have meaning ascribed. An animal, for example, has no knowledge of death. We must ask: "Why did s/he have to die?" To meaning is affixed a semantic response: It is idea and feeling. Filling our semantic environment, we find

individual "attitudes, beliefs, assumptions, values, ideals, standards, customs, knowledge, interests, conventions, institutions, etc" noted Johnson. The semantic environment is built upon a foundation of language structure. Language determines how we evaluate. Language and custom determine what we will evaluate. The environment changes constantly today and in an unpredictable manner. It changes as we grow older, gain experience, move around, interact with others and with an increasingly diverse range of people and experiences. It quickly becomes apparent to us that beyond our personal semantic environment lies a far more extensive environment, what we might call a culture, a larger social order, or universe if you will. The social order consists of a vast sea of people, ideas, objects. It is a sea that has grown from the small scope of farm and home, village and town, to something that extends to the ends of the earth.

How we evaluate our environment determines our behavior and how we evaluate is determined by our general orientation to that environment. One of Korzybski's fundamental assumptions was that language shapes thought and thought shapes action. His senior students, Hayakawa, Johnson, Rapaport, Bois and others, struggled with this problem well beyond his lifetime. Each struggled to find a method that would allow them to better cope with existence. Most of them taught these methods in classes, clinics and through the print media.

The basic problem, as Bois put it, is that "we have no way of determining whether the world is structured according to the pattern we ascribe to it." Experience serves more reliably to demonstrate the weaknesses of our theories than to validate them. The problem is accentuated, in Korzybski's words, because: "In the work of general semantics we deal with the living neuro-semantic and neuro-linguistics reactions, not mere detached verbal chatter in the abstract. ... The analysis of such living reactions is the sole object of general semantics as a natural empirical science."

As relativity and quantum theory have repeatedly demonstrated, reality is a joint enterprise between the observer and the observed. Because we humans are such an active element in the process of observation and action, we must always be acutely aware, "self-reflexive," of our involvement in our environment regardless of how passive and objective a role we choose to play.

RUNNING AFOUL OF REALITY

Ambrose Bierce defined "logic," in his *Devil's Dictionary*, as "The art of thinking and reasoning in strict accordance with the limitations and incapacities of human understanding." Charles Pierce noted that "A single unclear idea... [hinders] the nutrition of the brain." Or to but it into the words of psychiatrist Dr. Adolf Meyer, "What ails most people is not that they are ignorant but that they know too much that isn't so."

Where does the process of evaluation begin and what thwarts its proper function? As individuals existing in a larger environment, we coexist with a vast range of people and things. We are thus in a constant state of tension and conflict. Our ideas and reality are forever clashing. The tension produces the energy that drives us forward or back. How we interact with our environment depends on information. To gain information we must ask questions. The direction and extent of our development depends on the types of questions

we ask, Johnson noted, in his book *People In Quandaries*. Some questions lead to learning, others to confusion.

Our ability, our willingness, to question is conditioned by institutional barriers to proper evaluation. We are taught to give approved answers, not to ask questions. Every culture places great value on consistent behavior. Sinclair Lewis defined consistency this way: "A cockroach is consistent!" Emerson called “foolish consistency” the “hobgoblin of little minds.” The most consistent behavior is found among the mentally ill. The least consistency is found in the creative. Human beings are naturally creative, spontaneous. Children are naturally creative. But growth is stunted in childhood by environmental pressures. The schools represent authority and discourage criticism of social convention. Many critics charge that they retard through “education.”

Recent studies of college-bound students indicate that only nine percent can solve problems requiring reason and complex problem-solving skills. Korzybski observed that we have a large, well-established, well-paid industry that tells us how evil human nature is and seeks to impose its own authority on the lives of ordinary citizens. Consistency and control are only one stage. The Nazi's, Korzybski once observed, used propaganda to disorganize the nervous system, to deliberately destroy the individual’s capacity for evaluation – with the attendant results well recorded by history.

Human energy is "extravagantly" wasted, Johnson said, in asking vague and meaningless questions. Korzybski said that impaired evaluation leads to "speculation" on terms. Philosophers and social scientist often ask nonsense questions: "Why" questions, questions concerning shoulds and oughts.” Such questions are answered in elementalistic, absolutistic, two-valued (black and white) terms. In final analysis such questions have no answers. The unconscious suppositions underlying such questions are false-to-facts and delusional, leading to maladjustment and harmful behavior. False knowledge and false assumptions produce false predictions and unpreparedness (preparedness for the wrong thing). Instead of analyzing, of thinking, of trying to foresee consequences, we proceed by trial and error. We are thus no better than animals and our lives fail to progress. Nay, this rather leads to greater and greater conflict and human suffering. Jelliffe summed it up this way: Ignorance becomes a fault only when the individual permits himself to rationalize it. To admit that reality is incomprehensible is merely a rationalize of individual ignorance, he said, or more tersely, "incomprehensibility is ignorance.” To which Korzybski added that when we react as if our misevaluations are true "we are bound to be bewildered, confused, obsessed with fears, etc."

The blockage to progress is semantic. None of our problems occur in a semantic vacuum. Semantic blockages occur when meaning does not come through in an attempt to communicate or solve problems. It comes from the basic problems identified by Korzybski, the negative principles upon which general semantics is developed, as summarized by Stuart Chase: Confusing words with things, confusing levels of abstraction; inability to distinguish fact from inference; faith in absolutes; leaving important characteristics out; false identification; two-value judgments (no shades of gray); belief in the power of words-word images; the pursuit of meaningless questions” (Chase, 1948, 253). "The abuse of symbols" Korzybski said, "is like the abuse of food or drink: “it makes people ill." Such

unsatisfactory semantic states lead to a poorly functioning nervous system and deprive us of higher intelligence.

Mental illness and social maladjustment are the results of misevaluation. Korzybski returned again and again to this theme. Symptoms of misevaluation disorders include sudden displays of temper, worry, over sensitivity, excessive talkativeness. Maladjustment occurs when the principles of extension, probability, etc., are violated. It occurs when the world changes faster than we can adjust. The greater the change with which we fail to cope, the greater the maladjustment. Those who diligently seek to preserve the past disintegrate more quickly than those who try in some way to adapt. But as maladjustment progresses people tend to rely more and more upon the past, upon beliefs and theories, and upon tradition, rather than consult their experience of the world. They become increasingly detached. They ask "fuzzy" questions, questions which deny any hope of clear and precise answers, and which are founded on underlying, hidden assumptions. They become impatient, they don't read, they don't remember things, they are quick to find fault, they are often very neat and clean – compulsively compensating for the disorder in their lives, they become lost in fantasies. Many literally shut their eyes when confronted with reality. Others literally turn away from it, become angry when anyone attempts to provide them with facts. Some go to another extreme: They don't act "without the facts." They, of course, know "all about" everything. Such 'deep thinkers' tend to drift, are reduced to long spells of inaction, and become dilettantes.

Idealism is a form of maladjustment. Johnson noted three qualities of maladjustment in his patients: 1) Vague ideals; 2) which are wished for intensely; and 3) which produces well defined but transitory goals. Such idealization is socially acceptable. But idealism leads to failure and failure leads to what Adler called the "inferiority complex" which results in tension relieved too often in anger and hatred in some, boredom and ultimately depression in others, and, it seems increasingly today, in violence.

What is vagueness? Johnson defined it in terms of four principles of general semantics:

1) It is treating words as things (principles of identity);
2) It is placing things in explicit categories or pigeonholes (law of excluded middle);
3) It cannot be A and not-A (law of non-contradiction); and
4) It is treating complex experiences in terms of common sense as formulated by Aristotle.

Johnson wrote about the psychological process of projection. He spoke about an imaginary figure he called a "Ploggly." They are somewhat analogous to the Irish Leprechaun. Plogglies are our projection of chance and random behavior. If things go wrong, we say "The Plogglies did it." Human nature is a Ploggly. The economy is a Ploggly. The Cold War was a Ploggly. In a sense you can't do anything about them but in a certain sense we believe that Plogglies can be reasoned with, bargained with, bought off. We expect such fantasies in "primitive" people. We expect the primitive mind to lack appreciation of meaning, to be limited in ability to rationally evaluate, to be able to relate ideas abstractly, to appreciate significance. But this is no less true of the modern mind. And these semantic maladies are contagious. They are transmitted through the medium of

ordinary language, through academic discourse, idle gossip, and through the mass media. Like a virus in a computer these ideas corrupt what is known and they are passed on from mind to mind.

EVALUATION

The guiding process of the human organism is thought. What is thought? Thought involves problem solving, calculation, logic, adjustment, etc. Thought is evaluation. "Evaluate" is a term built on the Latin roots "e", to draw out, and "value." "Value" can be used as either a noun or verb to denote a thing valued or the value of a thing. Evaluation is the process of determining or accessing the value of a thing, an idea, etc. Psychologically, the term "value" denotes one of the essential forces in the human psyche; in the crudest form a polar or binary "switch" that signals "right" or "wrong," "good" or "bad," "true" or "false." Binary representation is one of the most difficult problems faced in conducting proper evaluation.

The entire point of general semantics is that evaluation is more than just thinking. It concerns the entire semantic response to ideas, to words, to language usage. We "think," like the lower organisms "respond." First there is an "irritation." Lower organisms respond by avoiding that irritation: By fleeing attack, by finding food, by moving to a more comfortable environment. Humans respond at an altogether different level. Humans respond in terms of meaning and purpose. We have a rich past, knowledge accumulated through time-binding, and we have a future to plan for and to live in. Thinking is for the purpose of getting things done. Emotions are involved. They are the source of motivation that impels us along the path of desired outcome. Continued progress of the human race depends on the development and use of a system of thought appropriate to the present day and needs.

Korzybski cited the Talmud regarding the need for systems of thought: "Teaching without a system makes learning difficult." In the material realm we have systems of thought such as the various sciences and mathematics. Aristotle gave us a form of logic that prevails to this day, in which he attempted to provide an all-encompassing system of human thinking. Aristotelian logic is simply not up to the task of thinking through the events of this day. Logic does not consult the entire organism and it is not, in fact, employed for the determination of truth.

General semantics refutes the efficacy of logic, or in broader terms, the whole corpus of Aristotelian thinking which still shapes the leading professions such as economics, psychology, politics, medicine, sociology, and history. It is not that logic is wrong, it is that it is a specialized field, which while of utility, perhaps, in a restricted area of application, fails in a larger context: That context being modern life. From Newtonian science we have proceeded to relativistic science. From Aristotelian logic we may proceed to non-Aristotelian general semantics. Bois pointed out that the difference between a logician and a general semanticist is the difference between an expert, a specialist, for instance in a sport, who does one thing well, and the well-rounded athlete who performs a wide variety of roles well in many sports. A. E. Van Vogt, in his general semantics-oriented novels, called such people Nexialists. Nexialism is a method for bringing diverse facts we observe in real time together to give us an understanding of the environment, and thus the capacity to

solve problems. General system theory has a similar approach. While there may be a place for the specialists, we must reverse the trend toward eliminating the generalists.

The general pattern of accepted thinking may be represented as: Objective, detached, narrowly focused, and dispassionate. The average reader would say: "Of course, that is the way it is supposed to be!" Korzybski responded with a whole new set of terms: Holism, multiordinality, indeterminacy, process, self-reflexive, semantic reaction, structural differential, extensional devices, asymmetrical relation, levels of abstraction, elementalism, non-identification, infinite valued logic, neuro-linguistics, neuro-semantics, psycho-logics, etc. He demonstrated, point by point, the failure of Aristotelian logic and the utility of general semantics as a new and effective mode of thinking, or rather of evaluation.

We progress because we have a form of collective mind. Through the process Korzybski labeled time-binding we have the power to borrow from the experience of others, even though long dead. We progress as we do because we can so readily borrow on these experiences. Locke, in his *Essay Concerning Human Understanding*, said that when he observed that all human knowledge is acquired through experience and tied that idea with the fact that language is the medium for expressing thought. Since the invention of writing, and especially since the invention of printing (and now the internet) we have possessed extra-neural means for recording and transmitting experience. As Karl Popper put it: "Faith in reason is not only faith in our own reason but also – and even more – in that of others."

The pursuit of knowledge has the purpose of bringing order, harmony, and unity to life, and to alleviate chaos. The purpose of thought is to forge links, through reason, to explain, inform, unify, and to predict outcomes. That is what Aristotle sought to do. That is what Newton sought to do. And, understanding the present need, that is what Korzybski sought to do. The purpose of knowledge, of thought, of evaluation, of reason, is to find order and stability – always keeping in mind that cosmos, nature, and history are fluid, dynamic, driven by time, forcing change at every moment.

We need some regularity in our behavior and that includes our thinking behavior. Without it there can be no order in society. One of the ways we attain an orderly life, of the mind and of society, is through education. Bernard Baruch noted that the value of an education isn't in what is stored in one's head but in the acquired discipline and the general philosophy of life gained from a study of the great minds of the past. From an efficient system of education we develop, in Johnson's words (1946, 357): "Efficient habits and routines, directed to significant purposes, clearly understood, and modified easily and effectively in response to changing circumstances." One of the outcomes of such an education, he noted, is maturity. Maturity is what we attain by becoming adults, by achieving "manhood. " Hayakawa (1963, 318) wrote that: "An adult – an emotionally mature person – is independent, able to work out his own answers to problems, and able to realize that there is no one answer to everything." Such mature souls become "men of action," individuals who are sure of themselves, who know what to do, who have "Minds that stay but in a world that doesn't." (Johnson, 1946, 199)

The fundamental orientation of general semantics is the conduct of daily life. It is an imminently practical and essentially pragmatic field. P. W. Bridgeman developed the idea of

"operational definition" which holds that operations, not properties, describe or define a thing. General semanticist Anatol Rapaport developed his own "operational philosophy" which he defined as "what to do and what to observe in order to bring the thing defined or its effects within range of one's experience." Rapaport was concerned with the problem of relating how one thinks about the world to how it influences what they do about it. Operational activity, Johnson noted, is, when one regards one's behavior as a technique and not as a trait. It is a matter of integrating thought and action – a subject upon which Hayakawa addressed in his best-known book, *Language in Thought and Action*. Turing, one of the pioneers in the design of the digital computer, said that a machine could do anything one can describe being done. The value of learning, for example reading this book, is found in the subsequent behavior of the reader.

Charles Lindbergh set out not to be a hero but to promote, i.e., operationalize, civilian aviation. The concept he set out to demonstrate was the reliability of modern aircraft engines (c. 1927). Though he won a prize for the solo, non-stop, crossing of the Atlantic Ocean in an airplane and is best known as, 'Lucky Lindy,' he was not "lucky," but rather a careful, exacting engineer. His life was devoted to what he loved – including not only aviation but also developing the first artificial heart. The twentieth century, and especially the period since the end of World War II, is a story of men and women, each in his or her own niche, who have left an indelible mark on the fabric of history, many of them through scientific discovery and application. Robert Greene's *Mastery* discusses this with great clarity.

Thinking consists of using words correctly and asking the correct questions. Before a problem can be solved it must be stated clearly. Accuracy, according to Johnson, is a form of mental hygiene (of mental wellness) and the techniques of accuracy are the techniques of language (just as, in reverse, the diseases of the mind are a product of poor semantic habits). Good questions organize information in a way it can be of use. If you are not getting the right answers, you are obviously not asking the right questions. A good question is often a new question.

One of the worst mistakes one can make is to simply apply established rules of thinking to the problems of life today: Using rules as substitutes for thinking. It is better to know and employ the principles that apply rather than rigid rules. If a person asks the right questions s/he can make appropriate adjustments to personal problems. In engineering, by asking questions and applying principles, one can build an office building, a new passenger airliner, design an advanced computer chip, or send a scientific probe beyond the edge of the solar system.

When we begin to talk about a workable technique, we cannot avoid the subjects of science and mathematics. The scientific method has been well established and employed for centuries. It consists of: Observation; stating a hypothesis – an idea that appears to explain a phenomenon under study; more observing or experimenting; recording the facts thus obtained; summarizing – which includes statistical techniques, computer models, etc.; generalizing a result, and presenting one's data for review. The hypothesis is either confirmed or denied and a new theory, an idea about how things work is developed and made available to the inspection of other scientists. The very nature of science, a principle Korzybski stressed again and again, is that any "fact" or theory or law is subject to repeated

scrutiny and endless modification. It takes humility. Even Einstein knew that his ideas would be chewed away in time and ultimately replaced by entirely new systems of science, just as his theories did those of Newton. Time-binding is a spiral process. It is based on feedback. It is constant testing, and it is constant progress.

Outside of the hard sciences the process is less certain. Social scientists have attempted to adopt the scientific method and have been repeatedly disappointed. Biologists and medical researchers have found that the life sciences pose problems in analysis that research in physics and chemistry is largely free of. Bertalanffy, a biologist, spent a lifetime developing what has been called general systems theory to establish a scientific paradigm for the life sciences and, with the assistance of social scientist and philosophers like Kenneth Boulding and the above mentioned Anatol Rapaport, and now many others, to extend and develop a more scientific system for human social sciences. General semantics anticipated general systems theory.

Remembering that there are two categories of words, descriptive words and inferential words, we observe that inferential words and terms involve assumptions. The various fields of philosophy are based upon differing sets of assumptions about reality and how one approaches an understanding of it. Epistemology, a philosophy of philosophy, seeks specifically to develop theories of meaning. Gödel suggested that even the most exacting formulations of science are based upon unfounded assumptions. Ultimately, however, what passes as facts in the field of human discourse, are merely opinions. They are personal and situational, not universal. We each have our own unique understanding of events. We begin to understand through the data of our senses, but we must go beyond direct sensory data. We compare what we sense with earlier experiences and draw inferences from that. We draw from the experiences of others. If we are of a healthy state of mind we will subject our inferences to verification, like a scientist subjects his/her data to experimentation and findings to peers for reviews.

Charles Peirce's pragmatism is based on the question: "How can I make my ideas clear?" That is a give and take process. We need to look at our questions, and the questions posed by others. The question is not "What is it?" but "What do we do about it?" General semantics responds to that question by applying standards of evaluation such as the extensional methods. It recognizes that an assertion is not a certainty but a probability, that it comes from personal experience and that it is a dim reflection of the actual experience it attempts to represent. Humanistic psychotherapy, much of which is founded on principles like, and often informed by, those of general semantics, addresses this process. It attempts to ask questions that elicit a more mature evaluation through the discovery of repressed memories, discovery of new meanings, and transformation of the unconscious into the conscious. It works to clarify and give meaning to experience.

The bottom line is that good evaluation rests with the individual. Each of us must be constantly aware and constantly on guard regarding our language behavior. We need tools but that is only the beginning of sanity. We must practice and we must be self-reflexive. Self-reflexiveness requires that one focuses on life, suspends verbal/symbolic behavior, and constantly experiments with techniques for living better. We all too frequently make the mistake of either living too close to our senses and not understanding the effects of mind

and language on experience; or living too far from our senses and relying on abstractions. General semantics is in the middle ground.

Self-reflexiveness is always asking: "On what basis do you make that assertion?" It asks: "Where does it come from and to what does it actually imply?" Most importantly, "Does it apply in the present context?" Johnson advised that: "With a fair amount of practice one can become reasonably skilled in observing these characteristics of language behavior in oneself and in others" (1946, 293). Bois (1966, 284) observed, regarding the practical experiments in life, that we are all amateur scientists of life: "When one is past 40, he has to be his own doctor to some extent; he has to know what is good for him and what is not." He doesn't discard his doctor but says "it simply means that he must acquire what a non-professional should know of medicine to take care of himself under ordinary circumstances." Such wisdom tends to come with age. One's state of health is always an immediate need, but so also are other facades of life.

VALUATION

Again, at the root of the word "evaluation," as noted, is the word "value." "Value" connotes worth. It is synonymous with "importance," "merit," "quality," "cost," "significance," etc. The most common concept of value is perhaps found in economics, in the value of money. The value of money, Korzybski noted, is found in human agreement. A problem with economics has always been the question of agreement about the distribution of wealth and the availability of money, at least in sufficient quantities to allow everyone to live adequately. The pursuit of wealth is a predatory game at which few may excel. The disparity between wealth and poverty has been a key issue throughout the course of history and especially around the world today. Actualized in the form of conflict between the ideologies of capitalism and communism, it led to decades of warfare and tension verging on the brink of nuclear mutual destruction. The stronger the passion behind a system of values, as Hayakawa noted, the "more sharply dichotomized the values."

Korzybski was not concerned with the content of ideas as much as he was with the relationship between those ideas. As a mathematician he was highly skilled in establishing the relationships between variables, between values. Mathematics is a marvelous system for not only establishing precise relationships between things but also for determining the value of unknown variables. In mathematics, a variable has more than a single value. It can take a whole range of values depending only on limits defined by the problem and the other variables upon which it depends. The "calculus" of human language also consists of an enormous number of variables and values for each. Yet the Aristotelian system treats language as if it were based on a two-value system of clear-cut choices. Neither premise must be, in fact, proven true to fact. Our minds are trained to respond in terms of two opposing values: right-wrong, true-false, good-evil, etc. Politics and television soap operas tell us that life is dichotomized, like Hayakawa suggested, into the true and the false, the white hats and the black hats: a strictly two-value logic.

Computers, working with the ultimately simple language of binary code, provide a constant background metaphor for thinking in these terms. Digital clocks count off seconds where analog clocks measured the passage of hours. Those of us in the field of automation learn the demanding and rigid logic of programming languages. We learn to think like our

programs, to learn, largely by our own human intuition, how these programs and computers function. We learn that computers are absolutely literal. But common sense, if nothing else, tells us there is a great disparity between machine logic and human behavior. There are altogether too many situations in life where success, even survival, comes from making just the right choice, of weighing the pluses and minuses and choosing the path with the greatest chance of success. We must deal with ambiguity. Too rarely do we get to choose in a leisurely, reflective, manner, thus resorting to more simplified tools and simple choices which can cause endless grief. This makes one wonder where artificial intelligence (AI) will go.

The core problem of Aristotelianism is that it is rigidly two-valued. Our language is based on a subject-predicate form that presupposes symmetrical relationships: one to one relationship. Korzybski said that this was the greatest problem facing human progress, indeed, human survival. We must learn to think in a multi-valued form, in shades of gray rather than black and white, in terms of asymmetrical relationships of "more," "less," etc. Korzybski cited the "structurally more correct 'logic of probability' of Lukasiewicz and Tarski, which in my non-el system becomes infinite-valued semantics."

Korzybski clarify three types of relationships: 1) symmetrical, where there is equivalence between a term A and a term B; 2) Asymmetrical, in which the relationship is "greater than," "lesser than," before, after, above, below, to the left, to the right, etc.; and 3) transitive (or analogous) in which we may say that if A is like (relates in such and such a manner with) B and B is like C then we may say that A is “like” C. For example, if we say A is larger than B and B is larger than C, it clearly holds that A is larger than C. Evaluation must be based on such relationship, not the Aristotelian logic which would make A and C equivalent, or merely “not” so. Ordinary language must be based on the relationship of more or less. Values must be based on degrees of rightness rather than right or wrong.

Formal logic works well with symmetrical relationships but not with asymmetrical relationships. Indeed, "more or less" is inaccessible to Aristotelian language. "Primitive" language escapes the problem because it is one-valued: Everything is simply itself. In formal debate, using two valued logic, we listen to <u>both</u> sides of the question; we decide who is right and who is wrong. When we divide into party systems (two-parties is, in fact, a general rule of our political systems), we classify those on the other side as not like us in some essential, perhaps human quality. We believe in absolute standards of judgment, and the question of quilt, of wrong-doing and blame, is always close to hand. Carried to the fundamentalist or ideological extreme, those who disagree with us are not only wrong but suspect of being evil or less than human. In two-value thinking we are forced to oversimplify cause and effect relationships. In symmetrical relationships, order is immaterial. In asymmetrical relationships it is very important. In short, Hayakawa affirmed, we simply cannot be rational and two-valued.

In two value thinking everything is equal, equivalent, if opposite in value. Sometimes we simply negate both extremes – if the options are equal and opposite in polarity, we are left not with a middle way but with nothing, with no clear answers, or with answers that appear in an undefined and indefinable realm of values. There is a story of three statisticians who went deer hunting that illustrates the emptiness of the middle ground. They spotted a deer and the first statistician shot and hit a tree ten feet to the left

of the deer, then the second shot and hit a tree ten feet to the right of the deer. The third did not shoot but jumped up and down in jubilation shouting: "We got it!"

Logic consists of rules governing consistent use of language. Hayakawa called logic language about language. But who sets the rules and how are they enforced? In every society there are those installed as arbiters of reason: Judges, administrators, legislators, bosses, jurist, priests, teachers, gurus, lawyers, police(wo)men, experts, economists, politicians, etc. The arbiter employs his or her own standards of judgment, speaks with their own voice of authority or with the voice of precedent, employs legitimate interpretation – a right perhaps won through long training and qualification, etc. But at base our judges operate out of their own illusions and at worst they are ventriloquist speaking in the voice of a higher authority without any mind of their own. These arbiters are the cornerstones of our institutions, the guiding lights of our way of life. How they establish the standards of evaluation determines the health of society? These systems are rife with distortion and disorganization, Korzybski noted, and they are thus the source of much human cruelty and corruption. Where they err, we all go astray.

Our usual standard of evaluation is the “gut reaction:” immediate and visceral. The is s. r. We need a pause. Korzybski said that delay is an essential quality of evaluation. When we follow our emotions, as we are wont to do, we forget to stop, look, and listen before, or if, we step upon the path of action. We are creatures of habit and tradition. We unconsciously accept the silent assumptions embedded in our language, never questioning how they came about and how they impact on our daily life. We are not happy with the way things are, but we will not make the effort necessary to question what makes it that way. These limitations are in part due to our language but in a greater part, Korzybski said, in our attitude towards the use of language.

We like to indulge in idle discourse: What is X? Why is X? We love the tale about the rabbit and the tortoise race. In that race the rabbit halves the distance each unit of time. By that rule the rabbit will never catch up to and pass the tortoise. What is wrong with this is that the problem itself is untrue. It is never likely to happen. With words, whatever one says is, is not, and our mindless speculations about the non-sensible lead us nowhere but into further delusion. When our attitude is delusional our actions, or inactions, cause great harm.

Korzybski was a master of common sense but to him common sense had uncommon dimensions. The basic principles he derived from a lifetime of studying human contingency are compelling on inspection. But they are very hard to put into practice. To put them into practice requires a system of procedures, a technology if you will, a discipline in learning and applying these principles to everyday life, an attitude of persistence, and the cooperation of our fellow beings. As previously noted, to avoid tension, we need to clarify understanding: Ask "What do you mean?" He related that many studies demonstrate that the tension in a group is reduced when a distinction is made between fact and opinion – a simple principle – common sense arising out of a sense-less world. He stated quite explicitly that general semantics "... will quiet down affective, semantic disturbances, sharpen orientation, judgment, the power of observation." We have put these principles into practice.

In the final analysis, it is the individual who makes the difference in proper evaluation. "Life is made up of absolute and unique individuals," Korzybski often noted. He meant several things by this statement. For one he pointed out the uniqueness of the experience of each person. For another, the need for individual responsibility. Yet another is that it is up to courageous individuals to break the molds of habit and seek a better form of life.

Today, after "*1984*" has come and gone, we wonder why no "big brother" system has (as yet) emerged in our world. Many societies tried it and many of those have simply broken down. Unless essential human qualities are completely destroyed, as tyrannies try to do, individual uniqueness becomes a factor in the human equation that ensures that human societies are so elaborate, so complex, that no system of rules will ever fully apply. Not only do we lose the prospect of centralized social control, responsibility for order and progress falls more and more upon the individual. This itself is a two-edge instrument that depends upon the qualities, the "sanity" of individuals. The continued decay of social order, as Korzybski believed it would occur, in the twenty-first century seems to be setting the stage for autocracy. In short, we have not made progress in solving our problems in the lifetime since Korzybski died[46].

It is a common error, I must again stress, to attempt to reduce human dynamics to statistical averages. Statistical averages are not accurate for individuals and Korzybski never sought to reduce behavior to statistical treatment but rather to apply the mathematical methods to understanding social thought and action as it is happening. It is not the value, not the result of the calculation, but the process of evaluation, that is important.

Johnson noted that there is a significant difference between "average" and "normal." "Normal," he said, refers to an evaluation of conditions. It is a general semantic term. It is not an "average" but rather: "...your car, the driver, and the conditions under which it is used." Indeed, the "normal" person is not "what is socially approved, medically required or condoned, and legally permitted." Helen Keller, he pointed out, was "medically wanting, social limited and legally restricted." Not only are individuals not an expression of some social average or norm but: "From an engineering point of view 50 million Frenchmen can be dead wrong." (1946, 339-340)

Johnson was a clinician, a speech therapist, who provided dramatic evidence of the power of general semantics to improve one of humankind's most notorious impediments – stuttering. He put a great deal of stress on learning how society affects our functioning – or in more direct language: "The way to avoid a danger is to learn how it occurs." People came to his clinic in search of a solution to a problem. He let them talk, let them get things off their chests. The most important skill for a clinician, he observed, is good listening. Good listening is active, interactive listening. It draws things out. One of the tools he used was to have clients and students write autobiographies. People coming into the clinic think their problems are unique. In sharing their autobiographies, they learned that they were not unique in having the problem but that there is a great deal of variability in individual situations, and that one must think about one's own problems and arrive at one's own

[46] The year after Korzybski died, Eric Hoffer's True Believer, explored the nature of social disorder and the rise of despotism.

solutions. This is what Korzybski called self-reflexiveness. Self-reflexiveness is seeing oneself involved with the problems of life. Alfred Binet, father of modern intelligence testing, stressed the importance of self-criticism in his definition of intelligence. Hayakawa simply quipped that people who gain self-insight can accomplish for themselves what others hire psychotherapists to do.

Chapter 7: Korzybski's Non-Aristotelian Systems

Korzybski's masterwork, *Science and Sanity* (1933), carries the subtitle: "An Introduction to Non-Aristotelian Systems and General Semantics." It was published by the International Non-Aristotelian Library Publishing Company. Why is general semantics non-Aristotelian? What does this mean?

Let's ask: What was Korzybski trying to accomplish? His objective was clearly a system by which we can form an accurate representation of the physical world within our nervous systems. This is achieved through the scientific method and mathematics. Such a system would make us effective human beings and establish a peaceful and prosperous society with abundance for all. Of course that ideal, while widely sought, was an unfulfilled longing. Rather the opposite defined human history and Korzybski's time.

There must, therefore, be some root cause to the troubled history of the human race. Darwin, Marx, Freud and others provided some conjecture about the causes of human dysfunction. Korzybski sensed something more fundamental than the forces of biology, psychology, and historical determinism.

To solve a problem, you must understand it. Einstein stated once that if he were given an hour to solve one of the most pressing problems of his time he would spend 59 minutes defining the problem. Korzybski spent years working on his problem statement, I spent a good 59 hours, more or less, extracting his analysis, but I think I can get the statement of the problem expressed in less than an hour.

Why, you could well ask, should I go to this trouble. My answer is that I want to understand that problem Korzybski spent his life trying to resolve: One upon which the future of civilization and the human race, in his opinion, and that of a large number of his contemporaries, depends. Korzybski chose as the iconic symbol of the problem the ancient Greek philosopher Aristotle. His solution was thus a non-aristotelian system.

Korzybski's first book was *Manhood of Humanity*. In that book he took a scientific-engineering perspective on solving the problems of a society just emerging from the Great War (World War I)[47]. There is scant mention of the Greeks in *Manhood of Humanity* but Korzybski was then looking at the historical pattern of human behavior. He observed the long history of poor thinking and even "cruel superstition." But his focus on Aristotle quickly followed the publication of that book.

"Fate and Freedom" was an address delivered by Korzybski in Chicago in January 1923[48]. In it he defended the need to draw on science, mathematics and engineering for a workable model to ameliorate the pressing problems of that post-war period. Korzybski referred to his friend, Cassius J. Keyser's "last book" *Mathematical Philosophy*, in which he stressed the idea of logical fate, which "essentially means that from premises consequences follow."

What is logical fate? In essence, our choices define our future and what we believe, what we think is true, determines future choices. The reason we are having such

[47] The fact that it was renamed the first of two, and a later feared third, global war, illustrates the failure of a small army of good men and women to find the solution.
[48] Published in *Alfred Korzybski: Collected Writings 1920 – 1950*.

overwhelming problems is that much of our thinking is based on pre-scientific ideas. It is at this point Korzybski brings Aristotle into the picture.

Korzybski noted a feedback mechanism: Conclusions based on false premises become labels attached to new experiences, creating a circularity of error. We carry many such labels from the earliest days of recorded human experience, thus our vocabulary is full of "…naïve generalizations full of silent assumptions, objectifications of non-existence." Both our daily speech and scientific language represent "one enormous system of such assumptions." We have thus created our own destiny. We persist, for example, in an unquestioning acceptance of Aristotelian logic that encourages an uncritical acceptance of unfounded (non-existent) postulates. Keyser called these "doctrinal functions." Starting with arbitrary, hazy feelings we end up with gibberish[49]. The emotions that drive this careless thinking occur in a flash while rational analysis requires time to think.

The root of the problem can be found in our language, its structure, use and the "silent presuppositions" upon which it is founded. Gödel and Paul[50] were already exploring the fact that even the most exacting science is rooted in inexplicable assumptions – or undefined terms. Aristotelianism is another matter. It is based on highly articulated assumptions that do not stand the test of science. We can perhaps summarize this as Mark Twain did: It isn't what we don't know but what we know that just isn't true that gets us into trouble.

In his "The Brotherhood of Doctrines," published first in April 1924, Korzybski added depth to the argument. Throughout history, he started, "gigantic thinkers" have shaped our mental processes. The ideal of the 'Brotherhood of Man,' he asserted, is in fact a brotherhood of doctrines, institutionalized beliefs, often "dismal, destructive, woeful and despairing," which he noted Keyser labeled the "Great Stupidity." They begin with what "may be called the Greek, or Metaphysical, or Pre-Scientific Period. But there are three stages in the evolution of thought. The second, the Classical, or Semi-Scientific, which he noted still reigns in most fields, gave rise to what he called "gross empiricism and gross materialism."

Korzybski wrote: "The general characteristics of the first two periods was that they both used traditional, insufficient, and often fallacious subject-predicate, Aristotelian logic which must result as it did in a philosophical impasse," a state of acute confusion. Korzybski devoted a two-page section to the "old logic." Much of our thinking, including that of many scientists, is still mired in the second period. And then came mathematical philosophy, the third phase, with George Boole's 1854 *The Laws of Thought* revolutionary.

Korzybski presented two papers on "Time Binding: The General Theory" in August 1924 and June 1925. The first, in which we recognize the beginnings of what became general semantics, focused on the use of the anthropometer (structural differential). The second gives greater focus to Korzybski's emerging non-aristotelian system, or in his words, at this point: "My work is deliberately a non-aristotelian system" (more below). The bulk of this paper is a continuation of the first and the development of the General Theory of Time Binding, largely with the use of the anthropometer.

[49] What today might be called GIGO: "Garbage In, Garbage Out."
[50] Paul anticipated Gödel but did not publish his findings.

The non-Aristotelianism critique was more fully formed in Korzybski's paper, entitled "A Non-Aristotelian System and Its Necessity for Rigour in Mathematics and Physics," presented before the American Mathematical Society in December 1931. In it he asserted that, "all existing schools accept implicitly, at least Aristotelian elementalism and do not challenge 'identity,' a principle which happens to be invariably false to facts and which therefore should be entirely abolished." He also introduced a "non-Aristotelian, non-elementalistic school of mathematics" which alone overcomes the limitations of Aristotelian systems. He stated that his aim was to examine "the unconscious operation of one-valued semantic identification…"

With *Science and Sanity*, Korzybski made his full statement on both the old, obsolete, aristotelian system and his new, scientifically correct, non-aristotelian system. Between 1921 (*Manhood of Humanity*) and 1931, Korzybski's system had obviously evolved. The fact that he developed a non-aristotelian system demonstrates that the influence of the ancient Greeks was of primary importance in the unfolding of history and the future of the human race. It isn't all about the Greeks, of course, but he found them a root cause.

Before getting into his more detailed critique of Aristotle, I want to make two side trips. The first is into Korzybski's world view and the second a brief history of the influence of classical Greek thinking from Aristotle to the Great Books of the Western world published by Encyclopedia Britannica just two years after Korzybski's passing.

Korzybski's Perspective

I think it important to consider that Korzybski's non-aristotelian system, and general semantics, is founded on a set of core values that defines it as an epistemology – a way of knowing – but it is one of determined objectivity. It is empirical. It is founded not only on the scientific method but also the new sciences of relativity and quantum physics. Yet it is more. It has something of an idealistic foundation. This idealism is also a cornerstone upon which the new sciences were built.

To put this in perspective, Korzybski was born and bred into the Enlightened Victorian culture of late nineteenth century Europe; an aristotelian society in its prime. He was an aristocrat, a nobleman, Count by rank. The family had a large estate, which he managed, but lived mostly in Warsaw, a leading cultural capital. The education of the day was classical: Greece and Rome. The aristocracy (then including a large and wealthy business class) was steeped in this tradition in private schools and more or less exclusive universities. German scholars of his time were particularly immersed in the classics. Korzybski had a fluency for language that allowed him to read and speak in six languages, including German. He was, however, educated as an engineer, not the classics[51].. He was a voracious reader, and his subject matter was largely the emerging science of his day and the very different perspective it was bringing to our understanding of the nature of physical existence, life and psychology. The new science of the turn of the century, of which Einstein was a leading figure, developed an innovative perspective on the nature of the universe. It was not only a breakthrough in science but a transformation in thinking, a whole new framework of assumptions about the nature of existence and the meaning of life.

[51] Korzybski apparently had little knowledge of Greek and Latin.

The beginning of Korzybski's lifework appears to correspond with the time he enlisted in the Russian army as a front-line intelligence officer during World War I. He witnessed its mechanized horror at first hand. A cane and a limp were the physical reminders of that experience but the psychological impact was profound. Indeed, that war cast a dark cloud of gloom over the human prospect; a gloomy outlook books like Spengler's *The Decline of the West*, gave chilling scope to.

Korzybski's *Manhood of Humanity*[52], gave cogent and exacting expression for the need to transcend the madness associated with that war and the promise of even more devastating wars to come. It took him another dozen years to develop his system to enable that cultural transformation. The celebrity *Manhood* brought him gave him an engagement with the brilliant literary movement of his day (he then lived in New York City); he traveled, lectured and consulted with the best minds in America and elsewhere. He read deeply and widely (the bibliography of the first edition of *Science and Sanity* contained 619 entries – and it has been suggested that he read them all) and spent two years working with Dr. William A. White at Saint Elizabeth's psychiatric hospital.

In 1933 *Science and Sanity* was published and the Institute of General Semantics was subsequently formed (in Chicago). In 1941 a second edition of *Science and Sanity* was published with a new Introduction that contained a concise summary of Korzybski's non-aristotelian approach, mentioned above. This edition followed several years of intensive seminars, research, writing and speaking. Korzybski had thoroughly tested his system and it withstood that test well. In the Introduction to that edition, starting page xviii, Korzybski gave a brief biographical outline of Socrates, Plato and Aristotle and the influence they had over a span of 2,300 years, including the physical sciences, medicine, and psychology.

A context of the tragedy of the older orientation was Europe engulfed in a new war which, within months of the publication of the second edition, would bring the United States into the global conflict that produced, among other things, the atomic bomb; a single bomb which could incinerate an entire city and kill tens of thousands of people in a blinding flash of elemental energy. It was a war driven by science and technology. Korzybski summarized his feelings of this new conflict in these words: "In a few years history will judge these dying spasms of the Aristotelian system …." He appealed to the leading minds of his day to seriously undertake a revision of the Aristotelian system, to learn from this great tragedy, and to establish a scientific orientation to the future development of the race.

The goal of Korzybski's system, as noted above, is to represent the world outside of our skins as accurately as possible within our nervous system. We might call this a form of phenomenology – of perceiving and describing what appears through the senses and, more exactingly, through scientific methodology, instrumentation, and mathematics.

Consciousness is supported by a nervous system that also provides us with our language capacity. You can't have an "I" without a language to express the experience in[53]. The non-aristotelian system acknowledges that both our observational capacity and use of language can be badly flawed. Further, that such flaws are deeply embedded in language, in

[52] Korzybski had by this time immigrated to the US and wrote the book in English.
[53] Descartes got his cart before the horse. It is not the "I" that thinks. It is the process of thinking, with which we are all born, that defines "I;" an essentially random accumulation of memories and experiences that define the ego.

culture and have been inherited (learned) from former generations. This legacy he named Aristotelian. This legacy allows us to think, in a highly logical and procedural style, about a world that just isn't what it really is. Korzybski asserted that this form of thinking is really little different from what we called insanity: A detachment from "reality." Do we wonder why there are so many factions in theology and philosophy? There is little, if anything, actually real to agree about. Political ideology does no better: Even conservatives cannot agree on what conservatism means (liberal's, who tend to embrace "anything goes," don't seem to really try to define liberalism)[54].

Since the emergence of modern science, there has been a bias towards understanding the world, cosmos and nature, as it really is, as strange as it may appear[55]. We need to have perspective on where we are on the scale of physical reality between the cosmos and quarks. We are as much a function of natural law as are stars and neutrons. We live on a planet that is the product of stellar processes, that is three-quarters silicon and oxygen and 90 other elements in a descending order of abundance. We are the product of four billion years of evolution. And we are a very recent phenomena of the evolution of life, a thinking being.

Our engagement with the universe is through a range of senses, that while limited in terms of the electromagnetic spectrum they can access, are the product of natural experimentation – relatively recently extended by instrumentation to the full spectrum and from the edge of the universe to its smallest components. Properly trained and informed, our minds can comprehend a great deal of what we call physical existence (albeit with very much yet to be learned; for example, dark matter and dark energy).

People, physiologically and neurological like us, have existed for perhaps 200,000 years and lived a very primitive way of life until about 5,000 years ago with the rise of civilization, and the explosion of technology and culture that largely defines us today, a span on which Aristotle stood mid-way. But in the last two centuries things have undergone yet another dramatic change. Each "wave" of human experience has had its own way of dealing with life. Korzybski was a pioneer in searching for this new way of thinking and we need to understand what he developed and give it a try. Thomas Kuhn's *The Structure of Scientific Revolutions* (1962) is a classical description of this epistemological transformation.

The Non-Aristotelian System

In the Preface to the first edition of *Science and Sanity*, Korzybski wrote that a machine that is lubricated with oil or grease that contains an abrasive material would soon wear out and break down. He applied this analogy to human thought: There is something in our mental "lubricant" that prevents us from achieving sanity, that is, proper mental function. He introduced terms like "elementalism" and "identification." He extended the analogy to include the spread of an infectious disease, one that has been passed down from generation to generation since ancient times, indeed, since at least the time of Aristotle. The spread of this "disease" has been institutionalized; we have made the process a profession.

[54] Even in general semantics it is difficult to find two people who fully agree about what it is, or for that matter, people who have even studied Korzybski closely enough to know what its is about.
[55] Unfortunately, there are a lot of people, and even some serious scientists, who use this strangeness to justify metaphysical speculations.

A lot of people had been writing about the problem of bad thinking, but a systematic undertaking of its resolution had not yet been undertaken, said Korzybski. And he intended to take on that problem.

The modern era has brought us a tremendous advance in scientific knowledge. Our leaders, and for that matter most people who attend our schools and colleges, have little if any understanding of it. They have been conditioned to a tradition of thinking that Korzybski stated is now known to be "false to facts." Their ignorance influences both how our society is organized and, with the advance of lethal technologies, how this imperils our future. Those trained in science, on the other hand, tend to focus on their specialization and not its application to a better understanding of daily life. This is Snow's "two-cultures" gap.

To solve a problem, you must understand it[56]. That is what Korzybski's writing on overcoming the Aristotelian orientation, and the formation of a non-aristotelian system, is about. There is a great deal of resistance, rooted in self-preservation of influential organizations and institution, to overcome. As a physician dealing with a life-threatening illness has no hesitancy pursuing his/her diagnosis, so Korzybski plunged into an analysis of what he considered a potentially "terminal" prognosis of society.

Korzybski employ the scientific method; in his words: "First, an accumulation of observations; second a preliminary formulation of some kind of 'principles, '(which always involve some unconscious assumption); and, finally, as the numbers of observations increases, it leads to the revision and usually the rejection of unjustified, or false to facts 'principles,' which ultimately are found to represent only postulates." He continued: "For expediency, assumptions underlying a system have (1) to be discovered, (2) tested, (3) eventually challenged, (4) eventually rejected, and (5) a system, free from the eventually objectionable postulates, has to be built." He gave several examples of how this process had unfolded in the recent history of science.

He concluded this line of reasoning with: "The present work therefore formulates a system, called non-aristotelian, which is based on the complete rejection of identity and its derivatives, and shows what very simple yet powerful structural factors of sanity can be found in science."

What's Wrong With Aristotle?

It isn't Aristotle who is to blame so much as scores of generations that followed him[57]. The Greeks begin the effort to improve language by building a system of philosophical logic, Aristotelian logic in particular. They were great mathematicians and geometers for their day. In his day, Korzybski noted, Aristotle's thinking was the most advanced and scientific in the world and its influence widespread. Aristotle and friends, over a period of several hundred years, made seminal breakthroughs in our understanding of the world and of human nature. They were a glimmer of light in a world defined by Homer; which is to say, barbarism. But that was 2,300 years ago. A lot has changed since.

[56] Again, Einstein and his one-hour problem.
[57] One sage suggested that most philosophy is merely footnotes to Plato.

Aristotle developed a system of deductive logic that gave weight to abstract debate. Pagan though he was, he became “The Philosopher” to the Medieval Church. With the Renaissance, his views influenced the emergence of science, a field that, however, adopted a mechanistic, clockwork (Euclidian), paradigm, that had, only recently, in Korzybski’s lifetime, been upgraded by relativity, quantum physics and advances in many other fields such as neurobiology and psychiatry. In Korzybski’s words: “The progress of science is due in the main to scientific methods and linguistic revisions, and so the new facts discovered by such methods cannot be properly utilized by antiquated psycho-logical orientations and languages.”

Aristotle was the teacher of Alexander the Great whose conquests spread Hellenism across much of the then-known world. Greek became the common language of this vast realm. Greek culture strongly influenced a region from Greece and Egypt to the Indus River, in today’s modern Indian, for centuries. Even the Hebrew scholars found it in their interest to translate the Torah into Greek. Great libraries were built at Alexandra, Pergamum and other places. Rome adopted Hellenic culture. The early Church Fathers were classically educated. When Islam conquered the Hellenic world, Muslim scholars translated Greek works into Arabic.

Renaissance

There is an important story in the Renaissance. Much of Greek culture was lost to the West after the fall of Rome. When the great schism occurred between Rome and Constantinople, the Eastern Empire retained Greek as its language and much of its Hellenistic culture while the West plunged into feudalism. The library at Alexandria had been burned by Christian fanatics because of its pagan origin. Many Greek works were preserved privately and these were sought and cherished by Moslem scholars during the Islamic ascendancy in the Middle East. The Crusades, penetrating the Muslim’s world, awakened a sense of something lost. The European world at that time was already becoming more materialistic. Business was booming, kings began fancying a revival of secular empires, and scholars, both sacred and secular, where dabbling in "natural philosophy.”

As the “dark ages” in western Europe came to an end, scholarly clerics traveled to Spain to study the Greek classics with Muslim and Jewish scholars. The Greek classics were translated from Arabic into Latin. When the Muslims conquered Byzantium, many Christian scholars fled to Western Europe and greatly swelled the ranks of classically trained teachers. Nonetheless, while the epic movements of the Renaissance and the Enlightenment fed on this ancient knowledge; they also began to explore, literally, new worlds, both geographically and intellectually.

The church was hard pressed to preserve its authority. It needed an invincible dogma, a solid legal system, and continued dominance over kings and burghers. Aristotle ironically became the savior of the church politic. The pagan Aristotle became "The Philosopher" to the medieval Scholastics. Aristotle and Euclid provided models of reasoning – simple, linear, authoritative – and a philosophical grammar well suited to preserving the authority of the Church. The Church, inserting its own dogmatic premises into Aristotle’s syllogism, employed its reinforced intellectual prowess to quell competition

– including alchemy and the embryonic empirical sciences, along with heresy and recalcitrant kings. Galileo, Descartes, Leibniz and other founders of modern scientific thinking were not above the authority of the church that was busy burning people at the stake for heresy. Too many of their free-thinking contemporaries, including Bruno, one of the greatest minds of his time, met that horrific end. The medieval Scholastics took it a step further and said that spiritual and physical existence are separate and distinct; and of course, the spiritual, supernatural, was, as Plato asserted, the real.

Medieval society adopted the approved structural metaphysics of the Scholastic – Aristotelian system embedded in the body of classical literature. Churches and universities trained generation after generation of clerics and aristocrats in the classics. There are powerful ideals embodied in that literature. There are also false-to-facts assumptions hidden in that language and culture, and we today are the victims of them.

There is tremendous power in the habitual use of language – a form of linguistic slavery. In the Medieval world, one didn't ask for clarification when they didn't understand something, they turned to authority, to that which was written, ancient and sacred. This is the stuff of dogmatism and intolerance. This system has been passed down to the current time. It is an infantile (in Korzybski's words) system of belief. Consequently, rulers and institutions were, and are, often infantile and in turn promote the general maladjustment of the masses. As a result, Korzybski said, "the present world conditions are in a state of chaos ...helplessness... hopelessness...feelings of insecurity... as long as such ignorance of our rulers prevails, no solution of our human problems is possible."

Modern knowledge of human biology makes it clear there are certain erroneous, false-to-facts, assumptions about human neurophysiology inherent in the Aristotelian system, and particularly that mind and matter are separate entities. Today we understand that whatever the as yet unclear nature of mind and spirit, empirically they are attached to body and associated with higher nervous function, i.e., the cerebral cortex. Body and mind function as a unit. Korzybski studied this phenomenon closely. Quoting Herrick, Korzybski pointed out the association between organism and environment in eloquent terms: "The organism as a whole reacts to the environment as a whole." Cause and effect is so complex and interactive that it is very difficult to isolate any direct relationships let alone accept that any part of us exists in isolation from any other. The sensory and nervous system are very closely linked with an extremely complex assortment of hormone producing organs. Those hormones are mobilized by activities within the brain.

Sic Et Non

Are there two sides to the story? Are we throwing out the baby with the bathwater? The radical Scholastic Peter Abelard dared to list the pros and cons, sic et non, of medieval theology and philosophy.

There can be no question that the Classical age has had a tremendous influence on the way we think. Korzybski's contemporaries and writers before and since have anguished over the problem. Since Korzybski's passing there has been a considerable new literature about the errors of much of our "philosophical" legacy[58]. Korzybski played a

[58] There has also been an extensive expansion of post-modern, anti-rational, thinking.

major role in focusing that conversation. We need to ask, is there benefit in studying the classics?

Thomas Jefferson, a very practical man, poured over the classic texts in their original language, reading them innumerable times right up to his death. During the nineteenth and early twentieth century a reading knowledge of Latin and Greek was a prerequisite to entry at many colleges.

During the late nineteenth century there was an intense interest in the classical world (and a growing interest in Eastern classics) and especially in philology – the exacting study of ancient linguistics and the origin and original meaning of the words used[59]. Frederic Nietzsche was a philologist and a leader in the field in Germany. His philosophy is deeply rooted in the Greek classics but not the rational, Apollonian tradition of Socrates, Plato and Aristotle. He turned to the more primal alternative, the Dionysian. He devoted considerable attention to the influence of Greece as exemplified in his *Genealogy of Morals*. Spengler, a close student of Nietzsche, in his *Decline of the West* (1918) gave considerable attention to the Greek influence on western history – as well as the philosophical foundation of Eastern cultures. He concluded, however, that the Greek world view was profoundly different from that of an emergent Western European, Faustian, mood.

The importance of these two "dead" languages has faded. Only a matter of a few decades ago, a knowledge of one or both of these languages was considered a mark of culture. But the trend was passing. Following the Reformation, Protestants translated the *Bible* into vernacular languages and now, centuries later, the Catholic mass is now vernacular (since Vatican II). Latin and Greek have become narrow academic specializations. You can see the prevalence of this view in the 1939 movie *Goodbye Mr. Chips*; a story of a British public-school master who spent a lifetime teaching generations of young aristocrats the basics of ancient languages they had little interest in but were required to learn. Chipping (Chips), however, exemplified a profound humanism that was the object of such study.

In the early 1920s, Columbia University professor John Erskine introduced a core curriculum of the classics translated into English. Mortimer Adler, a student, and Robert Hutchins, President of the University of Chicago, developed the *Great Books of the Western World* (1952); a 54 volume set of classics from the ancients through the moderns – all in English. This work was intended to capture the humanistic values of classical education. These include not only a knowledge of the great books but the development of critical intellect and character. Mortimer Adler wrote extensively on Aristotle and other Greeks and Greek-influenced philosophers, and his books were best sellers. St. John's College adopted the Great Books for its four-year seminar program in 1933 – which continues to this day on campuses at Annapolis and Santa Fe. Ayn Rand, a committed Aristotelian, wrote the modern classic, and continuing best-seller, *Atlas Shrugged*. For Rand, A = A was less an abstraction than a phenomenological thing-in-itself. Rand used this approach to bring society to its knees. She sought this not only in fiction but in fact – a potentially dangerous tool. The great books are currently used as the foundation of a number of educational programs, often defined as "liberal education,"K-12 and post-secondary, are seeking to

[59] There were a lot of variations in the text hand copied from generation to generation and occasionally passing through several translations in the process.

develop leadership and many conservative school and college programs have the explicit objective of political influence. Aristotle and friends continue their influence into the twenty-first century.

A number of Korzybski's contemporaries struggled with the influence of the past. Historians Spengler, Toynbee, Sorokin (a Sociologists) and Durant wrote their own enduring, multi-volume, history texts. The former three theorized about cycles in history. Durant and Russell wrote highly popular books on the history of philosophy. Korzybski was familiar with Spengler at least. In short, all sought to find a better way to develop our culture.

The Aristotelian System

Allow me to summarize. Ancient Greek society, Korzybski noted, was not far removed from the 'primitive' behavior described below. Our language, and our core values in law, government, education and religion, come to us (The West) largely from the ancient Greeks (and their students, the Romans and subsequent Catholic Church). How we think and act today is based upon a 2,300-year-old tradition. It is based on an even more primitive language structure poorly suited to understanding modern reality, indeed, detached from the practical life of man, based on emotions, dogma, traditions; and outdated values and ideologies. It depends for "factual" data on animal senses and its norms of behavior are essentially animal responses. Its hero is the warrior, as in Homer. It lacks a method for determining truth, i.e., a means for ensuring a correspondence to objective, empirical events. It lacks a means to evolve to better express the nature of human reality in an ever-advancing global, technological community.

As important as the Greek language was in its heyday, even then it was an ancient form founded on mythology and only scantily clad with empirical formulations "and possessing a primitive structural metaphysics which he [Aristotle] embodied in his famous logic." Korzybski stressed that Aristotle's logic involves a subject-predicate form, called a syllogism, governed by axiomatic rules, relying, he said, on the "is" of identity, and thus highly elementalistic. In the modern world, Korzybski observed, these forms are delusional "and represent the mechanism of semantic disturbances, making general adjustment and sanity impossible." This dogmatic formulation of language is still taught (circa 1933 and into the twenty-first century).

This archaic system has been institutionalized. It is indeed the venerable "Classical" tradition. In 1933 it was the, albeit fading, model of education and the foundation of character (public virtue) theoretically exemplified by social leaders: politicians, lawyers, priests, educators, and even businessmen. It is a model deeply rooted in a distant past and equally distant from modern scientific fact and method. This was true in 1933. It is even truer at the dawn of the twenty-first century. Yet while our language is founded on these ancient cultures, we have forsaken their classical literature that did, despite its shortcoming, provide us with a basic understanding of human nature, a model for noble character, and a true expression of human artistic creativity.

Korzybski profoundly admired Aristotle. He believed Aristotle would be truly dismayed by what has become of his system today. But the fact is that Aristotle, his forerunners, and innumerable literary and philosophical progeny who erected the

"classical" edifice, fashioned an outworn system that is so indelibly implanted into the modern psyche as to virtually defy amelioration.

Korzybski affirmed that his work is deliberately non-Aristotelian. He made it clear that he had not, in his extensive research, "come across a system of such a deliberate non-Aristotelian character." He admitted, however, that "The Greek gods are still potent, firmly rooted in our habits" and in the structure of the generally accepted form of representation. "In the present Ā-system, I reject Aristotle's assumed structure, usually called 'metaphysics' (circa 350 BCE), and accept modern science (1933) as my 'metaphysics'."

There is, he added, a "powerful, well-organized" system with enormous wealth behind it, based on Aristotelian and pre-Aristotelian standards of evaluation, that keeps mankind in delusional semantic states. Psychiatry can make little headway against such pervasive forces[60]. Many of the keepers of the old standards firmly believe they are performing a service to humanity while in reality disorganizing the nervous systems, particularly of children. "It is positively known that s.r. (semantic reactions) are intricately connected with electrical currents, secretions of different gland., (etc.), which in turn, exert a powerful influence on colloidal structure and behavior … imposing delusional s.r. on the undeveloped child which must result in at least colloidal injury, which later on facilitates arrested development or regression…" Korzybski proposed six specific areas of research to alleviate the problem and further elaborate this thesis.

Korzybski noted that the current system, which has lingered, as he repeatedly stressed, over two millennia, is hampered by an "enormous number of assumptions, … unconscious presuppositions [that] are false to facts, … delusional factors, with the necessary result of harmful behavior and maladjustment."

The root cause of the problem is found in language: It is found in our primitive structural assumptions. He noted that the progress of science has been based on "scientific methods and linguistic revisions that resulted in a new psycho-logical orientation and language." It takes more than simply a popularization of science but rather an intense study of these advancing fields of knowledge. Once we know the methods, human nature "*can be changed*."

Primitive Language

There are several degrees of "primitiveness" in language, and these can be divided along the line of literate and preliterate cultures. The invention of writing, and especially the alphabet which made a wider literacy possible, is the dividing line[61]. What Korzybski considered "primitive" in language is the structure of the language.

The language of pre-literate, which is to say aboriginal, societies, are very close to nature. There is little of the abstract in them. "Primitive" language is the language of the senses; it comes from direct, intense experience. Consequently, the way they perceive their world is much more direct than our own. Korzybski recognized that we do not understand our world today nearly as well as native peoples understand the one in which they live.

[60] Psychiatry is itself thoroughly aristotelian.
[61] Leonard Shlain, a Korzybski Memorial lecturer, argued that the alphabet produced its own difficulties, mainly that it forced us into right-brain, linear and reductive thinking. See *The Alphabet Versus the Goddess* (1998).

The language of the senses, however, is based on gross, macroscopic detail[62]. Such language contains an enormous number of names, or “things” words. It is a "kind" language. Modern language, by contrast, is more "degree" oriented. There are relatively few generalized words in indigenous speech – lots of "pines," "oaks," "ashes" – but less emphasis on "tree" let alone "forest." Some writers like to cite the fact that Eskimos have some 70 different worlds for snow[63]. But they don't have the broader concept of "snow." Every state of “snow” is both descriptive and consequential. Such language does not provide for much in the way of generalization, and it is difficult, indeed, virtually pointless, to employ abstract evaluation.

While the perception of the world may be far more direct in such societies, their understanding of it is an entirely different matter. Anthropologists have noted a “totem and taboo” framework of understanding nature. We call it superstition (albeit many modern people accept and practice these beliefs today).

Primitive causality (and by “primitive” in this case does not only refer to Neolithic people but to a more modern attitude towards thinking.) is usually based on crude temporal relationship, for example: If "A" occurs, then "B" occurs, we conclude that "A" caused "B. It may have been coincidence rather than causal. There is also a great deal of "magic" in primitive evaluation. To the primitive mind, in the forest or the city, words are things and recitation of words, it is believed, makes things happen in a supernatural manner. We see this in both theological and political incantations. Animals are frequently used as models for behavioral expression – bypassing human evaluation entirely. Rituals are used to reinforce beliefs and emotions and to invoke magic (enchantment). Emotional responses are studiously invoked. In short this is an application of projection, if not suggestion, in everyday life.

The Greeks had many of these superstitions, but they lived relatively easily with their gods – gods of human form and character; just more powerful. They had an alphabet (the word is composed of the first two letters of the Greek alphabet: alpha plus beta) and sophisticated grammar. They took conversation and debate to a high art. They formed schools. There was something of a publication industry: One slave, or student, read a manuscript while ten or twenty or more others transcribed it. I should add that the Greeks were not unique in this aspect. The Jews had a similar culture of literacy. Greek scholars since at least the time of Pythagoras traveled to Egypt and other places where written culture was well established. Indian and China had such cultures. That the Hellenic culture following Alexander’s conquest so quickly took root, implies that the ground was well prepared to receive it.

And yet, the culture of this period, roughly a half millennia before the beginning of the common calendar, Korzybski considered primitive in other ways. This takes two forms. First, a lack of empirical understanding of the world. Second, a highly abstract form of logic to which Aristotle is a seminal contributor.

It may be argued that the Greeks invented science. They developed an unusually keen interest in understanding how nature works. But they were perhaps more prone to

[62] Numerous case studies would strongly support Korzybski's basic thesis that these societies do not possess the evaluation tools to cope with the modern world—largely because of lack of higher-level abstraction.
[63] Skiers and certain scientific specialists also have long list of snow and ice types.

speculate than investigate. Democritus gave us the idea of the atom but it was sheer speculation. He is an example of the fact that the Greeks had very fertile imaginations. What they said was virtually everything imaginable. Sometimes that got it right, or close enough. Aristotle had, among other topics, a keen interest in nature. He collected and classified all sorts of things. Korzybski noted, however, that even the most perceptive natural observer of that age, and until the modern era, could only perceive at the macroscopic level: no telescopes or microscopes. And even if they dissected something, they had very little understanding what the internal organs did: That didn't come until the modern era[64].

There is something deeper and more profound in what we have inherited from the classical Greek culture and that is the ongoing argument about the nature of reality. Aristotle was a product of his movement, genius that he was. He was the third in an important line of philosophers who constitute the capstone of the Golden Age of Greece. Aristotle was the student of Plato, who was the student of Socrates. The Greeks, and Socrates is the iconic exemplar of this style, elevated mental rationality to the highest plane of human virtue. We still adhere to the basic belief that the better you understand life, the better it will be. But Socrates started, and Plato largely completed, a system that held that there are absolute forms that better define reality than the objects we experience. In short, the idea of a chair is superior to any example of a chair. These forms are very high-level abstractions and have even been disassociated from the world itself.

Plato divided mind from matter; he elevated it to a non-material plane consistent with his abstract reality. At this level the imagination becomes supreme. The material world is considered crude and illusionary. This philosophy found a bedfellow in religion. Logic gave power to dogmatic (abstract and unworldly) reasoning and "god" prevailed over the world. The Greeks were by no means alone in believing in the supernatural but for us, the western tradition, they catalyzed a line of thinking that is still very much in force today. There are more and more people who hold that science and religion need not necessarily conflict but theology is still a powerful force in the world. The Scopes monkey trial of 1925, the prevalence of creationism today and climate denial, strongly illustrate the persistence of this temper.

Aristotle's philosophy was in marked contrast to Plato's. They had different personalities. Plato was an introvert and a mathematician, prone to airy abstractions. Aristotle was an extrovert and didn't care much for numbers. Instead, he studied biology.

As noted, he had no tools to amplify his perception, no microscopes or telescopes, or even a good magnifying glass, thus limited in what he could see. The written form of Greek, which he used for his descriptive reports, was crude and hard to read, lacking the structure it has today. His science, in other words, was very limited by modern standards. He worked by classifying things into categories according to likeness. He drew sharp lines between categories (elementalism).

Aristotle also gave us deductive logic. It goes this way: If A = B, and B = C, then A =C. What it lacks is empirical relevance. His thinking was extremely linear and causal. He

[64] They did, however, understand that if they found diseased tissues in sacrificial animals, there was something unsafe about the environment.

relied on the law of the excluded middle which said A is B or A is not B and linked casualties by stating that if A was like B and B was like C then A was like C. One example of this reasoning goes like this: Socrates was a man; a man is a bird without feathers; therefore Socrates was a bird without feathers. This is called syllogistic reasoning. You can have a lot of fun with syllogisms, in part because you can argue to truly absurd conclusions. Whatever the truth of the premises you can say nothing of the truth of the conclusion.

I understand the power of the procedure; I studied logic in college. But I also took courses in science and those demanded that my premises have empirical relevance and my conclusion withstood empirical verification. I took courses in social sciences but found social theory too often could not be replicated, that is "proven." In theology, philosophy and metaphysics, it just didn't seem to matter. Ironically Aristotle lent great power to what he most disliked in Plato's system. When Platonic abstractions become the terms of the syllogism it becomes possible to have serious learned discourses on the number of angels that can stand on the head of a pin. Even modern academic philosophy tends toward fantasy.

Korzybski's Response

We often think the classics, in any culture, represent the height of civilizations. Actually they come with a perceptual decline in culture. They come out of what Spengler called "times of trouble." While America was in an expansive period, Europe of the late nineteenth century, the culture into which Korzybski was born and bred, was in a "fin de siècle" stage; a stage of psychic exhaustion. The works of Darwin, Marx, Freud and Nietzsche were ominous portents of a loss of the sense of human destiny. The Great War was a devastating experience for European civilization. Spengler's dark brooding was suggestive of the mood this period produced. There was also a hope that a new age was dawning. Korzybski was part of this optimistic movement.

The problem is the problem. We hear today that the mark of insanity is doing the same thing over and over again and expecting different results. Korzybski said "enough!" He was part of a new movement, armed with a new science, and though often fretful of the future, he never stopped either defining the problem or working for a solution. So back to the problem:

Aristotle, as a biologist, as noted, lacked modern scientific methods and held a "Naïve" worldview. However, for many centuries he has been taken as an authority. He recorded that women had fewer teeth than men so nobody counted. He recorded the number of teeth a horse had, so nobody counted. You just consulted "The Philosopher." His works were perpetuated by medieval 'philosophers' with "The consequences [that] were tragic for Indo-European culture, as there was no escape from identification of animals and humans," resulting, in Korzybski's time, Hitler and other madmen.

Korzybski made further points about the influence of Aristotelianism in today's world and then commented that: "The importance of the article by Dr. Novikoff is that he brought some fundamental points to a sharp focus" specifically in the history of biology, which includes the Aristotelianism of Charles Darwin and the differences between animal and human biology." He concluded: "The cataclysmic tragedies of today, predicted by many men of vision, have shocked us to a painful awakening where we must search for and

discover the silent assumptions which made such tragedies inevitable." "We must," he added, "make the decision to move forward from "the dogmas of the Dark and Middle Ages."

Today's academic literature is heavily footnoted with citations on the order of: "Authority So-and-so was obviously correct in stating that _____." The social (inexact at best) sciences are replete with such statements. I've often wondered what the criteria for "obviously correct" are. How often do we check the citation? How far are these references from our own direct experience?

Today, more than ever, we must change the way we think. Einstein was poignantly aware of this lesson. His theory of relativity replaced Newton's clockwork model of the universe. Newton's model was Aristotelian: logical, carefully compartmentalized, clean, neat and efficient, but incomplete and therefore inadequate to meet the demands of the twentieth century. Newton's age, like Aristotle's, held the ideal to be more real than the vulgar play of daily life. It was a good science for its times, but science could not continue to progress with it, so Einstein and his generation of scientists and engineers changed the model, the paradigm, and allowed science and industry to surge forward. Albeit with consequences.

The course of recent history has moved humanity to a new plane of reality. The Aristotelian system has not kept pace. Our problems today are too complex for analysis by Aristotelian means. Mathematicians have moved beyond Aristotelian logic and Euclidean geometry. Science has moved beyond the Newtonian model of the physical universe. The scholar or professional who is not a scientist or mathematician has not the tools needed to adjust to the world we live in. They lack both a scientific understanding of problem solving and a scientific understanding of humankind and of the world we live in. Social leaders are untrained in advanced models of evaluation, in part because our institutions are intensely protective of the status quo. The media also savors the conflict and disorder of modern life. This media and literature seem to relish wallowing in a shameless (trashy and infantile) emotionalism. Finally, the public is conditioned by the institutions of the status quo and fed with the hope that the political leaders of society understand what is needed. In this view Korzybski was well ahead of his time and indeed anticipating the coming world of Stalin and Hitler.

The basic problem with the Aristotelian system, indeed with the entire system of western thinking, is twofold: First, a conviction that a word is the thing it represents (identification). Second, that ideas can be divided into mutually exclusive categories (elementalism). These are the foundation of Aristotelian logic. It is a two-value system: something is either A or is not A. It assumes the word explicitly represents the object of experience. It assumes the word and the experience are one. It is a highly "abstract" system: It resides outside the bounds of ordinary experience, detached from the reality of ordinary life. It was a useful system to help establish scientific inquiry in the time of Galileo, Newton and Descartes but no longer addresses the realities of our world today. It is still a potent tool for practitioners of non-experiential fields: law, history, religion and even science. It is the foundation of education. Today, however, we need a system that provides the tools to clearly link abstract understanding with the improvement of life and living on the experiential level, places like our home, our neighborhood, our work place; and

increasingly the world. What we need is not further detachment from reality but a science that will serve direct experience of life. We need a new science, a human science.

The Aristotelian system has no place for relations because it uses a subject-predicate form. The form is inherently symmetrical: A=B and B=A. The Ā system must be non-symmetrical. Structural terms include before, after, greater, more, less, above, past, etc. Order can only be expressed in terms of asymmetrical relations. The organism as a whole is also defined by the relationship between its parts, plus something extra, that is, it is greater than the sum of its parts.

Today we have made non-Aristotelian advances such as symbolic and Boolean logic; system that give far greater definition to the relationship of terms.

To their credit, the Greeks tried to create a rational model of human nature and the world we live in but compared to today. They lived in a world far less complex than ours. They incorporated some significant assumptions in their models, which have been taken up time and time again, that have been used more often to impede as to advance real human progress.

Renaissance scientist, artist, engineers, and philosopher used classical philosophy with even greater success to establish a whole new way of thinking and of life called humanism. The thinkers of the Renaissance and Enlightenment, rational classicists, were deeply Aristotelian. Enlightenment thinkers like Newton and Descartes, and to Marx and Darwin, wrote themselves indelibly into history in the effort to build a new model of life and history and man; methodically Aristotelian. The sociological positivists from Comte to Parsons tried it. Korzybski complained that 20th Century psychology was elemental in that it separates mind and body, citing Freud, Dewey and Watson as thoroughly Aristotelian. Korzybski further observed that the language of Russell and Whitehead's *Principia* is itself Aristotelian and involves the 'is' of identity, or identification. Modern academicians still struggle to bring scientific legitimacy to their fields.

The lack of progress clearly indicates the overall impediment of the Aristotelian system. The lack of progress surely suggests some false assumptions and attitudes, and more, the lack of an imaginative effort to really try to go beyond authority and attempt to create a new model based on correct structural assumptions. Korzybski understood the basic nature of humankind. He saw to the root causes of our frequent failures to create a science of man. He clearly understood the limits of math and science when applied to the problems of life, particularly intelligent life. He did not claim to have found <u>the</u> answer, but he attained an arguably justifiable certitude that he was on the right path.

In recent years a number of important scientists have begun to question the Aristotelian structure of our language, such as Russell, Whitehead, and Whorf, he said, quoting each in turn. Korzybski further discussed the subject-predicate, two-valued, either-or, structure of language and the verb 'to be,' and its four different usages, including two that are destructive to understanding, and particularly identification, or taking the word to represent an object.

"Primitive" cultures, including those residing within industrial societies, blinkered by Aristotelian habits of evaluation, do not have a proper understanding of abstract ideas. Such understandings, say theories, themselves are abstract ideas. They lack a

comprehension of the dimensions of time and of process and change. Such people do not progress. Such were the Greeks and such are many societies on the Earth today. And, given that human progress is more than advancement in technology and material comfort, we must ask if our own society represents true progress.

The "calculus" of human language also consists of an enormous number of variables and values for each. Yet the Aristotelian system created a system of logic that is two-valued: A thing is either A or B. It assumes that what we say about a thing or event is the thing or event itself. It divides categories that we now know are inseparable such as body and mind, space and time. Neither option must be, in fact, proven true to fact. Our minds are trained to respond in terms of two opposing values: right-wrong, true-false, god-bad, good-evil, etc. Politics and television soap operas tell us that life is dichotomized, like Hayakawa suggested, into the true and the false, the white hats and the black hats: a strictly two-value "semantic. "

Our language has an Aristotelian structure based on a subject-predicate form that presupposes symmetrical relationships: one to one relationship. Korzybski said that this was the greatest problem facing human progress, indeed, human survival. We must learn to think in a multi-valued form, in shades of gray rather than black and white, in terms of asymmetrical relationships of "more," "less," etc. Korzybski cited the "structurally more correct 'logic of probability' of Lukasiewicz and Tarski, "which in my non-el system becomes infinite-valued semantics." He went on to clarify three types of relationships: 1) symmetrical, where there is equivalence between a term A and a term B; 2) Asymmetrical, in which the relationship is "greater than," "lesser than," before, after, above, below, to the left, to the right, etc.; and 3) transitive (or analogous) in which we may say that if A is like (relates in such and such a manner with) B and B is like C then we may say that A is like C. For example, if we say A is larger than B and B is larger than C, it clearly holds that A is larger than C. Evaluation must be based on such relationship, not the Aristotelian logic which would make A and C equivalent. Ordinary language must be based on the relationship of more or less. Values must be based on degrees of rightness rather than right or wrong.

The Problem is Language

Society, Korzybski said, as noted at the beginning of this section, is like a machine and the faster it runs the faster it wears out: As if there is some form of "emery" in the lubricant, a fine, hard, abrasive that grinds down the working parts. That 'emery' is our language usage. The structure of our language hasn't changed since Aristotle. Aristotle's language, circa 500 BCE, was based on a still more ancient Greek language and culture, one founded on primitive forms of perception. It may have served the Greeks in their day. It molded their culture and served them well in their time but the world is vastly different now. When we employ ancient, doctrinal, thinking (beliefs), derived in both form and content from the Greeks and their contemporaries, to explain and justify our lives, we are deceiving ourselves.

We think and words emerge without effort. Language is learned naturally and effortlessly by each new generation of children. Language allows us to think and to communicate but, so it seems, not necessarily well. Language is but a shadow of actual

experience. It is fraught with problems of emotional entanglements, honest misunderstandings, and deliberate deception. We know little about its natural structure and logic and have chosen instead to enforce our own rules on the use of language. Scores of generations of logicians, grammarians and semanticists have sought to master and teach good principles of communication. All that work tends to demonstrate that Aristotelian logic cannot cope with such complex interrelationship.

Most of our communication, in advanced societies, is not words about objects but words about words. We live our lives vicariously, distracted. It is in part due to our culture and it is partly due to our lack of awareness. In this respect our "primitive" cousins have us badly beaten. What we most admire about aboriginal life is that it is lived vividly, from moment to moment, with profound awareness of objective reality. Korzybski called this “first order” experience. "Modern" people have lost this vivid and immediate experience of life and many mistakenly seek to recapture some feeling of it through media stimulation, such as T. V. and computer games. Korzybski was pointing us back to this type of immediate daily living experience while at the same time keeping our very powerful rational capabilities intact.

The entire corpus of Aristotelian education is based on a reliance on words: Starting with words and ending with words but not with the stage of cognition preceding words. Korzybski, I would suggest, is one of the, if not the most important, founders of this area of linguistics and the structural differential is an invention, I believe, of surpassing importance.

As we reflect on this and the foregoing discussion of mental illness, it is also suggested that the qualities associated with primitive evaluation are very close to those that characterize infantilism and schizophrenia, noted Korzybski. We may conclude, from a psychoanalytic point of view, that primitive behavior is thus regressive. This whole subject, however, does much to illustrate Korzybski's principle of s.r. (semantic reaction). Many who read the above, the reference to “primitive,” who are liberal in inclination, or sensitive to the implication of racial prejudice, become offended. The emotional responses can obscure the pursuit of truth. It is thus time to practice a basic technique of general semantics called the "delayed response," to disconnect from the hormonal surges, to "count to ten," and read on. We should take note of the devastating impact industrialization has had on pre-industrial peoples. We generalize their culture and idealize them to a high degree and thus completely fail to truly understand them.

How can such widespread delusional behavior be maintained by society in general? It flies in the face of everything we accept as reasonable, even sacred. How can intelligent, educated, ethical, and well-meaning and “law abiding” people be so mindlessly destructive? So prone to indifference to suffer? So consumed by injustice? Working through one intellectual system after another Korzybski picked up the threads that turn into the very warp and woof of the fabric of our dysfunctional society. There is a deeply seated cultural reality that defines the way we see the world. It has been with us since the childhood of our civilization (virtually all cultures around the globe are victims in their own way). It is passed from one generation to another, indeed very carefully imprinted on each new generation through a variety of established and honored social institutions. It is profoundly

immature and it is unconscious. It is the pattern upon which our language is structured, and it is the root of the form of thinking which forms the very structure of our way of life.

Structure

Throughout Book I and scatter through Book II of *Science and Sanity*, Korzybski introduced his emerging non-aristotelian system and general semantics. The problem, as stated, is language – and the related issues such as the function of our nervous system in perception and communication. He developed a new grammar that more clearly defines structural relationships. A calculus of structural relationships itself became a key feature of this new system. He used the term "structure" repeatedly in the discussion above but in Book II he bears down on the nuts and bolts of his new system.

The Aristotelian system, being structurally different from the empirical world, prevents adjustments and produces maladjustment and psychopathologies, including insanity. Empty structure is rife with undefined terms, with over/underdefined terms – terms for which we have no true definition no matter how hard we try – which produce blind creeds and old truths (traditions) consisting of words without meaning. It is a language that can proceed only by similarities and disregards differences, thus failing to learn in a rapidly progressing world. It is language that forces us to sort, choose and homogenize. Philosophers have tried for millennia to straighten out this mess. A few, chiefly epistemologist, students of the theory of knowledge, who employ scientific methods and holistic views of reality, have made limited progress.

What is structure? Only Russell and Wittgenstein, Korzybski said, had seriously addressed it. He defined structure as "a complex of ordered and interrelated parts." The parts are derived as products of our mental processes, which act to distinguish objects, to classify them according to common characteristics, abstracted into "perfect *fictions*," isolated objects. We may begin to order these objects, as in the Aristotelian subject-predicted language that reinforces the isolation of the object; a structure not similar to that of the world, which Korzybski goes on to say, is not only fallacious but also anti-social. However, "The structure of the actual world is such that it is *impossible* entirely to isolate an object," giving as an example the "Einstein-Minkowski four-dimensional language "in which 'space' and 'time' cannot be separated empirically, but are "*interrelated ordered events*."

Korzybski linked linguistic revision with recent discoveries in science. He elaborated at some length the debilitating effect of the primitive, Aristotelian, language system (more of which in the following chapter) that persists to the present time (1933 and 2022). This failing structure came under new examination after Einstein demonstrated his new representation of reality. The old structure actually enslaves us to the point that it is extremely difficult to revise. Einstein made his advance only by refusing to be chained by Aristotelian-Euclidian-Newtonian frameworks. He saw the universe a whole, as an interconnected and interdependent phenomenon. Korzybski went on to delineate a long but admittedly incomplete list of topics he said, "I reject" in the Aristotelian system:

- The postulate of uniqueness of subject-predicate representation.
- The two-valued *el* 'logic', as expressed in the law of 'excluded third.'

- The necessary confusion through the lack of discrimination between the 'is' of identity, which I reject completely, and the 'is' of prediction, the 'is' of existence, and the 'is' used as an auxiliary verb.
- The elementalism, as exemplified by the assumed sharp division of 'sense' *and* 'mind', 'percept' *and* 'concept', 'emotions' *and* 'intellect."
- The *el* theory of 'meaning.'
- The *el* postulate of two-valued 'cause-effect.'
- The *el* theory of definitions, which disregards the undefined terms.
- The three-dimensional theory of propositions and language.
- The assumption of the cosmic validity of grammar.
- The preference of intentional methods.
- The additive and *el* definition of 'man.'

He then went on to list an extensive list of new 'orientations,' (1933, pp. xx-xxii) which he admitted is both only partial and staggering in scope and implication. In brief, Korzybski noted that his method was modern, a departure from the Aristotelians, that it provided an electro-chemical (colloidal) solution to the mind-body problem, that human characteristics are psychophysiological in nature, ditto consciousness, it leads to a general theory of psychotherapy, it formulated a foundation for mental hygiene, explored the problem of infantilism, "gives a semantic and structural solution of the 'organism-as-a-whole' problem," "reformulated Pavlov at the human level, and provided a new epistemology, introduced the concept of 'structure,'" which Korzybski defined as the only content of knowledge, discovered multiordinality, formulated a new theory of mathematical types, "offered a new non-Aristotelian solution of the problem of mathematical 'infinity'," provided a new definition of mathematics and number, presented a new understanding of relativity and quantum physics, and resolved, particularly, the problem of 'indeterminism' in quantum mechanics.

On page xx of the second edition of *Science and Sanity*, Korzybski gave a tabular listing of 52 distinctions between the "Old Aristotelian Orientations (circa 350 B. C.)" and the "New General Semantic Non-Aristotelian Orientations (1941 A. C.)." He concluded this table with a summary: "The new non-Aristotelian orientations differ as much from the Aristotelian as the Aristotelian differ from the primitive[65] types of evaluation." Following this table Korzybski provided a summary of the principles of general semantics.

The new grammar, the new structure, of Korzybski's non-aristotelian/general semantics system can be summarized, in part (there is always an etc.), in this list:

- Identity (non)
- Elementalism (non)
- Allness (non)
- Multiordinality
- Extension/Intension
- Self Reflectiveness
- Abstraction, Consciousness of
- Extensional Devices

[65] "Primitive" being defined as that of the orientations of pre-historic, aboriginal peoples.

- Etc. (Allness)
- Quotation (HLA-MO)
- Hyphen
- Index
- Date
- Chain index

I would direct the reader's attention to the chapter "Some Key Tools of General Semantics" at the beginning of this book for a description of each of these topics.

Chapter 8: Unsanity

Following the horrors of World War I, Korzybski, as did many thoughtful men and women of the time, went to work to find a better way to organize human affairs. In 1921, with his *Manhood of Humanity*, he set out to analyze the state of human affairs and offered a seminal approach to a science of humanity. Perhaps drawing on Burke's "wisdom of the ancestors," Korzybski used the term "accumulated knowledge of humankind." Korzybski had a new name for it: "time-binding."

Human beings have the unique capacity to learn and to pass on what has been learned to following generations. We have accumulated a huge record of human experience. We have vast libraries (and now digital media). We get a survey of this accumulated knowledge in schools and higher education. So, why do we have such poor results?

Nature formed the human mind to learn and to use what we know to solve problems; to increase our survival potential. With the human brain came language and a variety of other higher mental functions. These powerful advantages made us the dominant species. We became extremely effective hunters and the tools and skills used to hunt were also employed in war. War has always been a major part of human experience but the mechanized warfare of World War I was unprecedented in its horror.

War wasn't the only thing we did. We formed civilizations, established laws, created literature, music and other arts, established religions and dabbled in philosophy. Modern history created some new issues. It also produced a vast new literature about human possibility. It gave us the Enlightenment. It gave us the power of scientific enquiry and design. For better or worse it gave us the industrial revolution – new technologies and vast cities.

World War I was a turning point. But Europe was already in decline before the war. Oswald Spengler published the first volume of his classic vision of the end of civilization, *The Decline of the West,* before the end of that war. Other historians, philosophers, psychologists and social scientists echoed a growing pessimism. That war left a lasting scar. And it was followed by a lethal pandemic and economic collapse. No wonder there was a growing concern about the future of our species.

Korzybski set out to better define the problem of what we know about dysfunctional human behavior. He put a lot of time into understanding medical causes of mental abnormality. But he learned that you didn't have to have brain damage or a disease to become insane. Or for that matter, "unsane." Insanity he left to the medical profession. His main concern became how to help solve the problem of "unsanity."

In short, the problem is in how we think. The human brain is capable of powerful rationality. Science and mathematics, and not a few systems of logic, give us systematic programs for ensuring that what we think is based on precise methods. Science, engineering and technology require facts. The human brain, however, can think anything. Like the Red Queen, we can believe in many impossible things before breakfast.

Korzybski's approach to this problem was to gain an exacting understanding of how human neurophysiology and neurolinguistics works. It starts with the problem of how we ensure that what is going on (WIGO) in the world outside of our skins gets accurately represented in our mind. We can't solve the problems of living if our information about the world is faulty. As it came to be known about computers some decades later: "Garbage in, garbage out," (GIGO). But of greater importance, poor evaluation has its own numerous consequences to the person and to society.

Korzybski was trained in science and mathematics. He had a deep respect for rational thinking. He was something of a positivist. He believed we could have a science of humanity. He worked out a seminal model of how the human mind works and proposed a scientific methodology for vastly improving our perception, evaluation and communication ability. He called his system general semantics.

Korzybski found that many of our problems are caused by the use of outdated language. Classical, Newtonian, science had adopted many of those old methods. It saw the universe as a vast clockwork mechanism. It isolated the observing mind from the world of which it was a part and sought to understand. During Korzybski's life a new science was developed; a new physics and a new understanding of how the universe works. This was mostly expressed in relativity and quantum mechanics.

Korzybski founded vital ideas in the new science but of greater importance, he observed among the new crop of physical theorists not only an outbreak of genius but also that they were more good-natured than the Newtonians. Korzybski believed that the Einsteinian structural revolution, the new language that it had conceived, improved the way the human nervous system was used, which led to a general improvement in human function. In short, there was something about this new way of thinking, this new language of science, that improved both the intellectual and emotional life of its practitioners. Einstein himself exemplified a kind and noble, almost saintly, character. This was sanity.

Our World

Korzybski's experience, at first hand, of the bloody and horrific breakdown of European society leading to and during World War I undoubtedly had much to do with the direction his work took after the war. He wasn't a young man at the time he enlisted to serve in The Great War, having reached his mid-thirties. His job was to collect intelligence on the front of battle. He did that on horseback. The carnage on the eastern front was gruesome. The army he served in was virtually annihilated by the Germans. He, on several occasions during his life, spoke of both the physical and emotional scars he carried as a result.

His personal mission was based upon a very deep and profound humanitarian impulse. His experiences clearly motivated him to seek a workable alternative to political/military madness. The ongoing tragedy of human affairs, it seems, affected him deeply and continued to motivate him to do his best to offer humanity a prosperous and peaceful future to the end of his life.

What was the cause of human dysfunction? Industrial progress was clearly a causative agent; and Korzybski used a mechanical example to explain the process: Society,

he said, is like a machine and the faster it runs the faster it wears out. It is as if there is some form of "emery" in the lubricant, a fine abrasive that grinds down the working parts. That 'emery,' he concluded, is our language usage. Our language is antiquated. The structure of our language hasn't changed since Aristotle. Aristotle's language, circa 500 BCE, was based on a still more ancient Greek language and culture, one founded on primitive forms of perception. It served the Greeks in their day. It molded their culture; while it lasted. Latin and Greek were still required studies in schools and universities. But the world is vastly different now. When we employ ancient, doctrinal, thinking (beliefs), derived in both form and content from the Greeks and their contemporaries, to explain and justify our lives, we are deceiving ourselves. Korzybski would say the resulting perceptions are "false to fact." They are false because they are out of touch with the reality of our time.

Korzybski knew that an effect could have multiple causations. He knew that many possible causes underlay improper use of language and, as a consequence, of poor communication. He was a pioneer in the field of understanding just how complex a mechanism the human organism is. Even today, at the end of the 20th century, very few truly appreciate the complex interrelationship of forces that comprise the human experience on the personal, let alone on the social and global levels.

Our shortcomings, he concluded, are man-made and rigidly enforced. Our belief systems are doctrinal. Rule makers and rule enforcers govern our affairs. Our rules and rulers prefer that we do not upset the status quo. Our rulers, further, are all too often corrupt. The social system we live in has become so twisted it has become immobilized. We are in a state of nervous arrest. We have a (then) new media (radio, then TV and then the Internet in our time) through which the population is unashamedly manipulated by politicians, preachers, experts, promoters and producers of drama and comedy, news and culture. We are even prompted when to laugh.

We lack any systematic program for moral development. Technical progress, which brings us all the modern wonders of life, is inhumane. Language usage, then as now, perhaps more so today, undermines mental and moral values. We don't know where to turn and we shuffle through the day's muster of social leaders and "flavor-of-the-month" palliatives, turning first to one then to another, without real hope of relief. This is a good definition of neurosis. Korzybski, as we shall see, studied insanity under the guidance of one of the world's leading experts. But dysfunctional daily life isn't technically "insanity." Thus, Korzybski coined the term "unsanity."

Many Forms of Unsanity

One of the most important experiences in preparing the foundation for general semantics was Korzybski's work at St. Elizabeth's Hospital, the Government Hospital for the Insane at Washington, D. C, with Dr. William A. White. White was superintendent there from 1903 until his death in 1937. He was one of the country's most renowned psychiatrists and an influential leader in the development of American psychology. He organized one of the first psychological laboratories in the country (at St. Elizabeth). He sought to establish psychoanalysis as a scientific community. His goal was successful treatment of mental patients rather than merely custodial care. His belief in the Freudian method was firm enough to motivate him to nominate Freud for a Nobel Prize. Korzybski

applied for and obtained permission, a rare and important privilege, to work at the hospital with Dr. White. Korzybski worked closely with him for two years and counted him a “great friend.” Korzybski listed nine of White's books and papers in his bibliography. White returned the compliment of friendship and with an endorsement printed at the end of the second edition of Korzybski’s *Science and Sanity*.

Korzybski’s study at St. Elizabeth's, and of the theory and practice of the two primary branches of psychotherapy, Freudian psychoanalysis and behavioral psychology, gave him a deep insight into the phenomena of insanity. Learning from biology (Loeb in particular) and embracing the idea of the "organism-as-a-whole," Korzybski, White, and others, saw that mental illness could not be treated as an isolated set of symptoms. Reality comes, even common sense would say, from a complex interaction between mind and society, nature, the body, etc.

Korzybski’s hypothesis was that the problem with the mentally ill is not that patients’ brains are necessarily physically impaired but rather their models of reality that are not consistent with objective fact. They are thus delusional. The human mind, healthy or "ill," he wrote, is extremely vulnerable to destructive influences. He saw the real problem in large part as due to the western, linear, way of thinking that analytically separates phenomena into distinct boxes. At root this is the mind-body split. Schizophrenia can be defined as the ultimate mind-body split.

We all develop basic values and beliefs in childhood. They form the basis for evaluation, but such evaluations are by definition, and consequence, at this early stage, immature. These immature evaluations are buried in our unconscious and then built over layer by layer.

As we learn how to think, we may learn to think from fact (extensionally) or from fantasy (intensionally). Maladjusted people are oriented by intentional thinking – words about words – by imagination. They do not pay attention to what is actually happening outside their skins. They do not want to be bothered by the facts. Mentally ill people are not necessarily dim witted. They can be very cunning. They can outwit their doctors.

The magician illustrates how easily the mind is deceived through misdirection, half-truth, hasty generalizations, and false knowledge. Intellectuals, philosophers, lawyers and professional salesmen, media pundits, politicians and others, like magicians, said Korzybski, can be cunning in much the same way as the mental patient in the way they turn away from the pursuit of truth towards the game of deception and advocacy of unreality.

Korzybski highlighted the use of Nazi propaganda, by psycho-logical (hyphenated by Korzybski) experts, for destructive purposes to demoralize populations more effectively than the scream of bombs raining down on cities. This is the method of the magicians on an extremely pathological level for the explicit purpose of inducing unsanity, resulting in the —breeding of fears, anxieties, hates, etc., which disorganize individuals and even nations. These distortions are fed by Aristotelian habits, he added.

Of greater importance, however, is not how we manipulate others, but our own self-deception. Korzybski listed three characteristics of the problem: 1) Most people "know all about" the problems of existence; 2) the very structure of language itself is

inconsistent with the facts of existence; and 3) the fragmented, non-holistic quality of our understanding of human existence.

So, who is really unsane? Any form of semantic misevaluation produces deep-seated disorientation in the nervous system, which is manifest in inappropriate behavior. Korzybski wrote that they produce symptoms of stress, social maladjustment, unhappiness and result in a lowering of human cultural and ethical standards. In medicine, he complained, some doctors operate at the level of veterinarians – treating patients as a form of animal and neglecting the essentially human element in their patients. There are a number of biological theories that do not support the idea of an essential humanity. They and other schools of psychology fall into the mind-body and reductionist thinking trap. As a result, in science for example, the technologists become weapons experts perfecting the means of destroying "enemies" in the interest of the nation they serve. Unscrupulous lawyers, working not for justice but for a fee, pursue wealth and even fame without regard to the society law was developed to protect.

Common sense would tell us that people do not want to be treated impersonally, as animals. They do not want to be killed by some faceless technological expert. They do not want their legal system used to exacerbate social inequity. Yet some professional practitioners stand common sense on its head in the interest of "knowing best," or worse, seeking power over others. There is a serious question of basic justice involved when delusional people gain the power to control society.

These types of statements are certainly damning indictments for Korzybski to level against the "professions." But the link, he concluded, is inescapable. Mentally ill people often think like certain highly educated professionals. They think in terms of ideas that may have little correspondence with the facts of the world they live in. Professional associations may also institutionalize a powerful collective delusion. They have their own "word salad" language, unique codes of ethics and behavior, detachment from external standards of evaluation, etc. Intellectuals, those highly educated in intensional methods (words defined by words), particularly, are well known for their oddness and their lack of contact with life. The "mad scientist" was becoming a common theme in popular literature in Korzybski's day. Depression and maladjustment are not an uncommon experience for professionals.

People who are judged mentally ill and confined become perhaps more completely introverted into their delusions, become socially isolated and often (less and less often these days) removed from society. Pirsig, in *Zen and the Art of Motorcycle Maintenance* and *Lilia*, explored this process from the personal experience of a philosopher who had become insane. Zen, deep introspection at the silent level, brought him back into contact with life and living. Carl Jung also worked his way through a severe psychotic episode. A number of other psychologists who experienced debilitating episodes later contributed to this topic. These individuals essentially concur with Korzybski about the consequences of inadequate evaluation of reality and demonstrated their point by reversing the process.

McLuhan said that the medium is the message. The medium is a fabric woven of language. This medium may be more real to us than what we directly experience. Pavlov said it too: Men are more influenced by words than the actual facts of reality. The bottom

line, in Korzybski's work, is that we don't actually know what we are talking about. Our view of man is speculative, metaphysical. We have no science of man, no objective reality of who we are and how life works. Without that standard our history shows wild fluctuations, cycles of growth and decline, of creation and destruction. Norbert Wiener described such fluctuation in a cybernetic system as "insanity." As a consequence, our history is a long list of extinctions. Civilizations arise under the influence of a creative minority and then they decline and disappear.

Neuro-Semantic Dysfunction:

The purpose of general semantics is to improve understanding, to improve language, to enable us to better evaluate and share meaning from our experience. The understanding we derive from experience depends on how we use our mental abilities—on how well we think. The nervous system functions to coordinate activities in the body. To this end Korzybski sought first of all to understand how the human nervous system works. He sought to define what proper mental function and language behavior are not and goes on to considerable lengths to describe behavioral traits that are the clear consequence of limited or distorted capacity in this regard. Any conflicts or impediments to nervous function reduce the effectiveness and survival potential of the organism. In animals that usually means death in short order. In human society it takes on other forms called social dysfunction. Too rarely do deviant individuals directly and personally pay the full price as a result of their harmful behavior. The price of collective dysfunction, however, is truly appalling as with Korzybski's war experience.

In addition to Korzybski's conclusions about unsanity above, there are several classes of human neuro-semantic dysfunction to which he draws attention:

1. Injuries to the brain itself, for example the lesions of aphasia.
2. Forms of pathologies addressed by psychoanalysis such as schizophrenia.
3. Behavioral complexes called infantilism and narcissism; forms of mental incompetence rather widespread throughout the general population--much of which is within the realm of "normal" behavior.
4. Chronic and acute symptoms of semantic disruption due to improper evaluation.

I want to address each of these in greater detail.

1. Brain Injuries. Certain forms of inability to understand language fall within the realm of medical science. They involve actual physical impairments to the nervous system. Korzybski cited aphasia as an example and defined it as "a disorder of comprehension and expression." It is a lack of ability to use and understand language due to microscopic lesions in the brain. He noted that in various degrees the symptoms of aphasia are like those of semantic disturbance. He thus begins to link the behavior of semantic disturbance to empirically verifiable losses of brain function.

For more than a century, medical researchers have linked certain behavioral disorders to damaged portions of the brain. One such is the Broca area, discovered in 1861 by French physician Pierre-Paul Broca, who, after several autopsies, deduced that language function associated with recognition of words was centered in the left temporal lobe. In 1874 German neurologist Karl Wernicke found another area associated with grammar

farther back on the left cerebral hemisphere[66]. The conclusion Korzybski drew was that our inability to properly evaluate experience has the same effect as defective brain structure, albeit not as irreversible. He stated, rather clearly, "microscopic lesions, drugs, and false doctrines...may often produce similar end results."

2. Mental Illness. Sigmund Freud, a Viennese medical doctor specializing in neurological disorders, applied his seminal genius to the development of a radical from of medicine, the "talking cure," for emotionally distressed patients who showed no physical causes. Early in his career Freud had studied the human brain in the laboratory in microscopic detail and he had an exacting medical knowledge of the effect of injury on its function. He concluded, however, that much mental dysfunction was of a non-physical nature and could be addressed through the medium of language. Through decades of exacting research Freud developed the field of psychoanalysis and attracted some of the best minds in Europe and later America, both medical professionals and laymen, to his work. Some of his most notable early students, e.g. Jung, Rank and Adler, developed their own theories of psychology and psychotherapy which greatly extended the range of Freud's original formulation. Indeed, over the years, Freud's school threw off many notable sparks, some loyal but brilliant, like Eric Fromm, others radical, like William Reich, and Fritz Perls[67], founder of his own well-established school of Gestalt Therapy.

As noted, Korzybski studied psychopathology closely during his two years with Dr. White. Korzybski concluded that mental illness and social and psychological maladjustment, are typically due to a common causation – semantic disturbance – and particularly to poor perception and misevaluation occasioned by adhering to outdated and outmoded forms of thinking.

Korzybski noted that it took a good brain to be really crazy. Schizophrenics can think very well, even brilliantly, but they turn reality inside out. Schizophrenics treat imagination as concrete reality. They thoroughly confuse their inner reality with the world. They switch high order abstractions, usually pure fantasy, with low order reality. They experience what Korzybski defined as three forms of nervous disturbance: 1) Delusion, or the projection of ideas into the external world, which violates the general semantic principle of non-identity; 2) Illusion, misrepresentation of sensory experience, or perceptual distortions, which violates the principle of proper evaluation; and 3) Hallucination, or perceiving things with no basis in sensory experience, which are, in general semantics, reversal of orders of abstraction and the major symptom of serious maladjustment. Korzybski noted that ignorance, illusion and hallucination are "dangerously akin," differing only in emotional intensity.

3. Infantilism. Korzybski devoted an extraordinary amount of attention to this topic. He believed infantilism represents a major problem in the modern world. It occurs at all levels: It affects individuals, it affects societies, nations and even the world. Hitler and Mussolini were bizarre caricatures of infantilism posing and prancing on the world stage. Mentally ill people tend to regress towards a virtually infantile state of dependency. Psychological regression is a return to childlike modes of behavior. It means becoming

[66] This cumulative evidence led linguist Norm Chomsky to conclude that language function was found in the very structure of the brain, in short "hard wired" into the brain.
[67] Perls acknowledged Korzybski's work in an article in the September, 1967 issue of "Etc."

more introverted, a loss of the power to discriminate, an inability to remember recent events (attention deficit), etc. It is manifest in "infantilism," "narcissism," "schizophrenia," etc. The problem, of course, is that while children have few responsibilities, adults are presumed accountable. Children are cared for by their family. Severely dysfunctional adults must be cared for by medical practitioners and institutions. Or not. Children continue to learn and progress towards full responsibility as adults, whereas regressive adults are no longer able to develop.

Infantile people are emotional, suggestive, moody, easily intimidated and frightened. They are indifferent, live only for the present, seek immediate gratification, and don't think about consequences. Their behavior is contagious, and their influence is pervasive. They seek standardization and are dogmatic and opinionated. They leave their thinking to others. They like to use lawyers to fight their battles. Infantile women, with the power to bestow approval, encourage infantile men to commit outrageous acts, to fight and even kill. They encourage men to go to war, but, Korzybski observed, future wars (and this was before the massive bombings of World War II), fought from the air, would no longer spare these women of the consequences.

There are those who are sociopathic. There are degrees of sociopathy. Most infantile persons are socially functional. Many of them hold important positions in community, business and government. Their trail through history is marketed by scandals and infamy. Such behavior is considered "deviant" rather than an illness. Infantile types are often charming, and their charm is based on their seeming helplessness. They are often exhibitionistic, promiscuous--with sexuality based solely on self-gratification. Infantile nations, like Nazi Germany and Fascist Italy, express their exhibitionism and the funerals of American gangsters were often marked by costly pomp, very elaborate and well attended. They are showoff rather than solemn.

Infantile adults do everything in extremes (Aristotelian two value logic). They are good or bad, introverted or extroverted, immoderate or prohibitionist. They love to engage in, or watch, games of defeating opponents (sports). They are indecisive, self-justifying, credulous, possessive, fantasize romances, acquisitive, like glitter, the bizarre and grotesque, domineering--even sadistic--or docile and resentful, show little respect, and exaggerate.

Infantilism is self-centered. It is marked by hedonism. An extreme form of infantilism is narcissism. The mythological Narcissus, upon seeing his reflection in a pool, became totally engrossed in it. Narcissistic people have an exaggerated self-regard. Their exhibitionism often leads them into public careers, when they possess the necessary looks and a measure of talent, but they are easily discouraged, tire quickly, are irresponsible and unreliable, often bitter and pessimistic. They are, Korzybski suggested, "moral imbeciles."

The above is a litany of the world's ills that Korzybski seems to have held as important elements of his problem statement. We can each elaborate on this. Probably every reader thought of a long list of people who are infantile, selfish, inconsiderate, irresponsible, self-absorbed, etc. Indeed, a whole generation is today called the "Me Generation." One author noted the theme of a contemporary generation was "Lets talk about me!" The State of California has made a motto out of "Doing my own thing." An

important period in the intellectual development of this country, the human potential movement of the 60s and 70s, was frequently satirized for its narcissism. The counterculture was an infantile expression. The Yuppies of the 80s, and not a few flamboyant, and sometimes indicted, political and business figures, took self-gratification to new limits. Corporate, political and even evangelical scandals highlight the scope of this issue.

Korzybski did not address autism. The condition was first described in 1943. It is an emotional disability that does not affect cognitive ability. The Rain Man is an illustration of extraordinary mental abilities exhibited in some autistic individuals. There can be both medical and social causes. There is an increasing level of autism in modern society.

Semantic disturbances.

The fourth class of human neuro-semantic dysfunction is the key to Korzybski's system. He called it "semantic disturbances" or "semantic reactions."

Citing medical evidence to establish the foundation of this argument, Korzybski examined how misevaluation of experience leads to a range of harmful disturbance of proper mental function. He estimated that 90% to 99% of the human race is "unsane." If he means that very few human beings operate at anything like their peak potential, we would probably have wide agreement. We live in an increasingly complex and fast-paced society. Life can certainly be highly stressful. There is a long list of physical and mental illness and a large industry that provides palliatives.

In contrast, the pace of life in pre-industrial societies is slow – bound to the cycle of the season, consistent and reliable, and replete with healing rituals and social bonds the like of which we can hardly comprehend today. Native people have intricate and effective healing rituals. Farm and town folk, of old, had churches, town meetings, barn-raising, and fairs – an elaborate repertoire of social adjustment systems. The Chinese developed whole philosophies, replete with medicine, mysticism and social rituals, which they refined for millennia, to maintain a major civilization dedicated to stability.

The old ways of life are, of course, giving way before the forces of material progress. Korzybski emphasized that while we have experienced incredible progress in the material realm, we have not done much to change our way of thinking. *Science and Sanity* came out in 1933, only one third of the way into the incredible twentieth century. A few decades later came books like *Future Shock* and *Megatrends* that highlighted the increasing rate of change, of complexity, and of anxiety. There is much more we could add about this topic today in the wake of the personal computer, internet and cell phones. The modern world is ever more a "matrix" of words – abstract, poorly defined and uncritically accepted. They create a severe turbulence in our nervous system, turbulence Korzybski defined as semantic disturbances.

Semantic Reaction or (s.r.), was Korzybski's term for disturbance of the semantic process that produces mental illness. Harmful s.r. is characterized by "insecurity, a floating anxiety, fear, worry, disappointment, depression, hopelessness." Where does it start? With obstacles and frustrations. Ordinary aggravation, if left unresolved, may lead to patterns of behavior that are defined as "mental illness, prostitution, brutality, violence, suicide, etc."

Inability to overcome obstacles leads to regressive behavior. It is not pain that causes regression. It is semantic disturbances, failures of evaluation, inability to cope, etc. It begins with expectations--about marriage, men and women, husband and wife roles, work, society and politics; etc., and it turns into confusion and misevaluation – confusing the words, the ideals, with reality leading to disappointment. Mental illness occurs when we begin to withdraw from reality out of fear, shutdown sensory awareness, and lose our sense of self-discipline. In short, our minds become "semantically arrested." Semantic blockages reduce brain function just as surely as if it were physical in origin. Turning away from the world the mentally ill begin to fantasize and in extreme forms hallucinate. They become convinced that what they think is what is actually going on in the world (projection). Thus, noted Korzybski, unicorns exist and the search for them becomes a search for "truth." He went on to say: "...the consuming hunger of the uncritical mind... impels it to feast upon shadows in the prevailing famine of substance."

Any abnormal behavior (maladjustment) is non-survival for humans. Semantic disturbances begin with words and perception but affect the entire organism. Carried to the extreme it produces a repression of emotions. Schizophrenics are out of touch with their emotions. Successful psychotherapy involves working with emotions, reliving them and bringing them back into alignment with evaluation. But how successful is psychotherapy? Unknown, concluded Korzybski. Institutions are full of hard to treat or untreatable patients. Failures in private practices are not recorded. The great majority of cases are only partial recoveries – just enough to get people back to some degree of social function. Today the vast majority of psychotherapy is not even strictly medical. People go to psychotherapist for brief periods for help with specific problems. The use of mood-altering drugs is escalating. A very large number of people are in chemical dependency recovery programs – a life-time plan for fighting addictive/dysfunctional behavior. A lot are not.

States of Mind

General semantics is not psychotherapy but there is evidence to suggest that Korzybski and his pupils had some notable success with mental illness. Some of his principal students reported considerable success in several disciplines. Dr. Douglas M. Kelley, Fritz Perls, Institute of General Semantics honorary trustee Abraham Maslow and other psychologists and psychotherapists, endorsed general semantics in therapeutic practices.

Korzybski's ideal state of mind is clear thinking. In order to think clearly, we must perceive clearly. Since most of our knowledge of the world is indirect, we must be very careful what we take to be real. Evaluation, or thinking, Korzybski said, is the most fundamental psycho-logical (his hyphen) process. Every human being with a whole brain is a thinker. The insane are thinking – often with astonishing intensity.

The problem is that thinking is not done clearly. By 1933 science, mathematics, industry and technology had been progressing for generations and yet the world had been through one terrible global war and was clearly on the way to another with even more horrific weapons. In the early years of the century science and mathematics had begun a dramatic revolution – a tremendous change in conceptual knowledge brought about by

virtually pure thought. Progress in science, mathematics and technology have done nothing if not accelerate since then. But do we think any better than in 1933?

Man and Animal

What makes us different from animals, Korzybski reiterated, is that we "bind time." Time-binding, from his *Manhood of Humanity* (1921) refers not so much to history and culture as to the intellectual and linguistic capacity that creates them: We are aware, we remember, we tell others what we experience, and eventually, we record these experiences in extra-neural forms, in writing and in artifacts. In the last 5,000 years, since the invention of writing, we have accumulated a vast treasury of human experience and insight. Why then do our wars become ever more terrible? Korzybski answered that lacking a true understanding of our own semantic mechanism; we continue to act like animals in our reactions.

During the age of exploration and empire, a great territorial greed (animalistic, space-binding) propelled history from one bloody conflict to the next. We readily found justifications, indeed elevating them to the status of 'honors,' for aggressive behavior. The great ideals upon which the colonial policies were founded came in large part from a perversion of the purely scientific work of Charles Darwin. Many intellectuals developed theories about a "survival of the fittest," dog-eat-dog, world. Spencer wrote of social Darwinism – a model of pre-sentient evaluation applied to the human animal. Karl Marx said we are driven by history and, in its service, we must arise and destroy. Marx allowed for some human values but left their realization in the hands of bloody revolutionaries and some truly brutal tyrants. Then came Freud who said there was a deep, unconscious, drive over which we have little control except by the utmost exertion of will. The ideas of that day, which we carry to the current day, inexorably weave themselves into successively greater tragedies on the world stage. Korzybski believed something must be done to stop this trend and he was convinced he had a key to a new science of human engineering.

As a result of our unique human capacities we can produce things no animal possibly can. We can overpopulate the globe because we produce food artificially and abundantly. Animals die when their numbers exceed the available food. Malthus thought humans would too, but then came the industrial revolution. Science and technology were applied to producing more food and materials.

Humans, employing "bound time," have developed science, technology, industry, mechanized agriculture (along with fertilizers and pesticides), cities, railroads, ocean liners, airplanes, telephones, radios (and in our day, T. V., the personal computer, atomic energy and space travel), social organizations, the city, writing, metallurgy, religion, sublime literature, and in the last century an accelerating explosion of innovations driven by the increasingly systematic power of science and industry. We do not, however, manage our creations responsibly. Like in the Gollum legend, or Frankenstein story, we become the victims of our own creative powers. We thus have created mechanized warfare replete with chemical and atomic weapons of mass destruction, economic depression, crime, poverty, insanity, famine and disease. The worst of these self-imposed calamities is war, which, as the Great War proved, is growing in power to consume lives and wealth. War, Korzybski

concluded, is nothing but the product of our animal nature. Animals, however, don't die for slogans.

Human beings are built on an animal "chassis." We have essentially the same sensory, nervous and endocrine systems as other mammals. Indeed, the difference between our DNA and that of the higher primates is exceedingly small, perhaps only one to two percent. What humans have is a more developed higher nervous system, especially a cerebral cortex through which we achieved conscious intelligence. We are endowed with speech, that very capacity that allows us to learn and to pass knowledge on to others. Science is simply a highly refined method for learning and communicating knowledge and skill. It emerged from the basic capacity for language and it points in the direction of the proper development of a workable language for the future.

Despite these advances, however, the simple fact remains that all these higher functions are simply appendages. Our higher nervous system overlays existing structures in primates and even lower orders of vertebra. Much of our nervous function follows the same old pathways through the lower brain. An exchange of words, even a glance, can set off a sequence of emotional responses leading to flirtation or to tragedy, or both. If we are to make progress, we must understand how we think in both physiological and psychological terms.

To a large degree we have response patterns similar to those found in animals. Our emotions are based on the fight-flight response. Physically we are not very good animals. We are not very strong and not very fast. Matched barehanded against most predators and human beings become a relatively easy source of fat, juicy protein. Give the puniest human a gun and a little skill, however, and even the fiercest predator becomes a head on the den wall. Long before the gun many species, including powerful predators, such as the saber-toothed tiger, and great beasts such as the mastodon, succumbed to no more than stone-tipped spears, plus cunning and teamwork, as humans expanded across the globe.

Humans lack basic instincts common in animals. Many animals can walk and can feed themselves within minutes of birth. Because of our large brain cases we are born far earlier in our physical development and must thus be nurtured through an extended period of helplessness. As Institute of General Semantics honorary trustee Bucky Fuller was fond of saying, all human beings are born naked, helpless and ignorant. Children don't learn to walk for a year or so and don't know how to find food and shelter for many years. Humans must learn manual skills and they must learn to think in order to survive. Nowhere in our makeup does it appear we have the capacity to revert to animal instincts and survive. In the rare case of a child born without a cerebral cortex, or in the more common cases of injury to the centers of higher nervous function, we become not feral but helpless and are generally institutionalized.

Modern knowledge of human biology makes it clear there are certain erroneous, false-to-facts, assumptions about human neurophysiology inherent in the Aristotelian system, and particularly that mind and matter are separate entities. The medieval Scholastics took it a step further and said that spiritual and physical existence are separate and distinct. Whatever the nature of mind and spirit, however, empirically they are attached to a physical body and associated with higher nervous function, i.e., the cerebral

cortex. Body and mind function as a unit. The sensory and nervous system are very closely linked with an extremely complex assortment of hormone producing organs. Quoting Herrick, Korzybski pointed out the association between organism and environment in eloquent terms: "The organism as a whole reacts to the environment as a whole." Cause and effect relationships are not "A causes B." They are complex and interactive. It is difficult to isolate any direct relationships. No part of us exists in isolation from any other.

Pavlov, whose works first appeared in English around 1927, noted that any changes in the stimulus-response relationship produce disorientation. Change in the environment can thus produce very profound changes in the organism. What those effects might be, Pavlov observed, were not well understood as his research did not address the human higher order function which are, he understood, very distinct from his animal subjects. Words, like memory or physical stimuli, produce a neural-physiological reaction. However, we need to note at this point that the organism's response comes as a surge of neural signals that converge at the base of the brain, following eons-old response patterns that kick in autonomous, instinctual, behavioral patterns that have the power to overwhelm the higher order mental functions. One of the fundamental principles of general semanticists is that by delaying these responses, by an act of will, we begin to gain a little more time for the higher order functions to come online and thus respond as human beings and not as animals.

The second point is that the body is an electro-chemical engine. It employs both chemistry and electricity to carry out its basic functions. Nerve energy involves electric current. Cells are colloidal structures and sustain life through the presence of electrical charge. A disturbance in the electrical charge of the nervous system has the potential to affect both the chemical and electrical function of cells throughout the body. Since the body is a single and interdependent system, anything that affects a part of it affects all of it.

Primitive Thinking

Korzybski drew additional insights regarding the problems of human evaluation from several fields to more clearly demonstrate the inadequacies of existing forms of language behavior to cope with the exigencies of the modern world. The first is the language behavior of native peoples, a language adapted to a world experienced far more immediately than in the industrial, or even agricultural stages of development. Another consists of inherited forms found at the very roots of our present system of education, most particularly the values and methods drawn from the classical (Aristotelian) period of our western history. These represent two stages in the evolution of human perception of the world.

The Aristotelian system, Korzybski insisted, is based on primitive language and a poor understanding of empirical reality. What, we might ask, is "primitive" language[68]? Language has evolved for at least 200,000 years. The language demands of a hunter-gatherer society are more elemental than an agricultural, let alone industrial, society. What he carefully pointed out was that the languages of such societies are very close to nature. Consequently, the way they perceive their world is much more direct and

[68] The word "primitive" is now politically incorrect. Too, we have progressed considerably in our understanding of such societies since 1933 and find them complex in their own right; just as they are vanishing.

far less abstract than our own. Such language is the language of the senses – it comes from direct, focused experience.

Korzybski recognized that today we do not have the sensory perception of the world around us anything like what native peoples perceive the one in which they live. The language of the senses, however, is based on immediate, macroscopic detail. Such language does not provide for much in the way of generalization and thus is not amenable to abstract evaluation. It contains an enormous number of name, or thing, words. It is a "kind" language. Modern language, by contrast, is more "degree" oriented. There are relatively few generalized words in indigenous speech--lots of "pines," "oaks," "ashes," but less emphasis on "tree" let alone "forest." Some writers like to cite the fact that Eskimos have some 70 different worlds for snow[69]. But they don't need a generalized concept of "snow." Every state of "snow" is both descriptive and consequential. Survival depends on it.

Primitive causality (and by "primitive" in this case does not refer to aboriginal peoples but rather to a modern attitude towards thinking.) is usually based on crude temporal relationship, for example: If "A" occurs, then "B" occurs, thus "A" caused "B. There is also a great deal of "magic" in such "primitive" evaluation. To this type of mind, in forest, field, or city, words are things and recitation of words makes things happen in a magical manner. Animals are frequently used as models for behavioral expression – bypassing human evaluation entirely. Rituals are used to reinforce beliefs and emotions and to invoke magic. Emotional responses are invoked. In short this is an application of projection, if not suggestion, in everyday life. In modern life there still is a trend to think that just saying the words can change things. Harry Potter is, of course, very popular.

As we reflect on this and the foregoing discussion of mental illness, it is suggested that the qualities associated with primitive evaluation are very close to those that characterize infantilism and schizophrenia. We may conclude, from a psychoanalytic point of view, that primitive behavior is thus regressive. This whole subject, however, does much to illustrate Korzybski's principle of s.r. (semantic reaction). Many who read the above, who are sufficiently liberal in inclination, or sensitive to the implication of racial prejudice, may become offended. The emotional responses in such readers clouds their thinking. It is thus time to practice a basic technique of general semantics called the "delayed response," to disconnect from the hormonal surges, to "count to ten," and read on. We should take note of the devastating impact industrialization has had on pre-industrial peoples. We see aboriginal life as simpler and for that matter saner. Unfortunately, in our own abstract thinking, we have little understanding of aboriginal cultures. We have abstract ideas about their culture and idealize them to a high degree but little if any direct experience of their lives. And now, those cultures, with their own marvelous accumulation of knowledge and wisdom, are disappearing at an alarming rate.

Ancient Error

How can widespread delusional behavior be maintained by society in general? It flies in the face of everything we accept as reasonable, even sacred. How can intelligent, educated, ethical, well-meaning and law-abiding people be so mindlessly destructive? So prone to indifference to suffer? So indifferent to injustice? Working through one

[69] Skiers and certain scientific specialists also have long list of snow and ice types.

intellectual system after another Korzybski picked up the threads of thought that are the very warp and woof of the fabric of our society. There is a deeply seated cultural reality that shapes the way we see the world. It has been with us since the childhood of our civilization. It is passed from one generation to another, indeed very carefully imprinted on each new generation through a variety of established and honored social institutions. It is profoundly immature, and it is unconscious. It is the pattern upon which our language is structured, and it is the root of the form of thinking which forms the very structure of our way of life.

Korzybski, as noted, attributed the root cause to the Greeks. Ancient Greek society was not far removed from the 'primitive' behavior described above. Our language, and our core values in law, government, education and religion, come to us (The West) largely from the ancient Greeks (and their students, the Romans). How we think and act today is based upon a 2,500-year-old tradition. There are some good ideas in ancient tradition. It is indeed the venerable "Classical" tradition. Yet it is subject, again, not to our understanding of ancient people but to our interpretation of what (often too little) we know of them. It is based on, in fact, an even more primitive language structure poorly suited to understanding modern reality, one detached from the practical life of man, one based on emotions, dogma, traditions and outdated values and ideologies. That can be found in Homer. It depends for factual data on animal senses and its norms of behavior are essentially animal responses. Its hero is the warrior. It lacks a method for determining truth, i.e., a means for insuring a correspondence to factual, empirical events. It lacks a means to evolve to better express the nature of human reality in an ever-advancing global, technological community. This archaic system has been institutionalized. In 1933, it was the, albeit fading, model of education and the foundation of the ideal character (public virtue) theoretically exemplified by social leaders: politicians, lawyers, priests, educators, and even businessmen. It is a model deeply rooted in a distant past and equally distant from modern scientific fact and method. If this was true in 1933, it is even truer in this twenty-first century. Yet while our language is founded on these ancient cultures, we have forsaken their classical literature that did, despite its shortcoming, provide us with a basic understanding of human nature, a model for noble character, and a true expression of human artistic creativity.

Korzybski searched for a label to exemplify this ancient tradition. He settled on the name of Aristotle, the last and greatest of that golden age of philosophers[70]. Korzybski profoundly admired Aristotle. He believed Aristotle would be truly dismayed by what has become of his system today. But the fact is that Aristotle, his forerunners and innumerable literary and philosophical progeny who erected the "classical" edifice, produced the outworn system that is so indelibly implanted into the modern psyche as to virtually defy amelioration.

Aristotle was, of course, a product of his society, genius that he was. He was the third in an important line of philosophers who constitute the capstone of the Golden Age of Greece. Aristotle was the student of Plato (who was the student of Socrates), and the teacher of Alexander the Great. Aristotle had a vast knowledge of his world, much of it fed by Alexander's conquest of that world. His personality was in marked contrast to Plato's. Plato was an introvert and a mathematician, prone to airy abstractions. Aristotle was an

[70] Which was in fact the end of a declining Greek society.

extrovert and didn't care much for numbers. Instead he studied biology. He had no tools to amplify his perception, no microscopes or telescopes, or even a good magnifying glass, thus limited in what he could see.

The written form of Greek, which Aristotle used for his descriptive reports, was crude and hard to read. His science was very limited by modern standards. He worked by classifying things into categories according to likeness. He drew sharp lines between categories. His thinking was extremely linear and causal. He relied on the law of the excluded middle which said A is B or A is not B; and established casualties by stating that if A was like B and B was like C then A was like C. One example of this reasoning goes like this: Socrates was a man; a man is a bird without feathers; therefore Socrates was a bird without feathers. This is called syllogistic reasoning. It is the structure of the logic that is important, not the content. Whatever the truth of the premises you can say nothing of the truth of the conclusion. You can have a lot of fun with syllogisms, in part because you can argue to truly absurd conclusions. Ironically Aristotle lent great power to what he most disliked in Plato's system. When Platonic abstractions become the terms of the syllogism it becomes possible to have serious learned discourses on the number of angels that can stand on the head of a pin.

Much of Greek culture was lost to the West after the fall of Rome. The library at Alexandria was burned by Christian fanatics because of its pagan origin. Some Greek works were preserved privately and many of these were sought and cherished by Moslem scholars during the Islamic ascendancy in the Middle East. Eventually Greek knowledge returned to Europe in large part as a result of the Crusades. The European world at that time was already becoming more materialistic and amenable to old pagan views. Business was booming, kings began fancying a revival of secular empires, and scholars, both sacred and secular, were dabbling in "natural philosophy" (science).

The church was hard pressed to preserve its authority. It needed an invincible dogma, a solid legal system, and continued political control over kings and burghers. Aristotle ironically became the savior of the church politic. Aristotle, pagan to the core, became "The Philosopher" to the medieval Scholastics. Aristotle and Euclid provided models of reasoning – simple, linear, authoritative – and a philosophical grammar well suited to preserving the legitimacy of the Church. The Church, inserting its own dogmatic premises into the syllogism and employed its reinforced intellectual prowess to quell competition including alchemy and the embryonic empirical sciences along with heresy and recalcitrant kings. Galileo, Descartes, Leibniz and other founders of modern scientific thinking were not above the authority of the church that was busy burning people at the stake for heresy. Too many of their free-thinking contemporaries met that horrific end, such as Bruno, perhaps one of the greatest minds of all time.

Medieval society adopted the approved structural metaphysics of the Scholastic-Aristotelian system embedded in the body of classical literature. Churches and universities trained generation after generation of clerics and aristocrats in the classics. There are powerful assumptions hidden in that language and culture, and we are the victims of them. There is tremendous power in the habitual use of language – a form of linguistic slavery. In the Medieval world, one didn’t ask for clarification when they didn’t

understand something, rather they turned to authority, to that which was written, ancient and sacred.

This is the stuff of dogmatism and intolerance. The system was passed down to the current time. It is an infantile system of belief. Consequently, rulers and institutions were, and are, often infantile and in turn promote the general maladjustment of the masses. As a result, Korzybski said, "the present world conditions are in a state of chaos ...helplessness... hopelessness...feelings of insecurity... as long as such ignorance of our rulers prevails, no solution of our human problems is possible."

Curiously, science adopted much of the linear, reductionistic and deductive patterns of thought. While it made incredible progress, science, and we use the term Newtonian to define this earlier period, adopted a vision of the world as a vast, clockwork, machine. Descartes gave this era of science a Platonic framework. He meticulously separated mind and body. It took the advent of the new science, of relativity and quantum physics, to put the universe back together as a whole, integrated, mutually interdependent system – of which human beings and human society are parts. In this respect, Korzybski was a pioneer in working for an updated model of evaluation.

A New Direction

The course of recent history has moved humanity to a new plane of reality. The Aristotelian system has not kept pace. Our problems today are too complex for analysis by Aristotelian means. Mathematicians have moved beyond Aristotelian logic and Euclidean geometry. Science has moved beyond the Newtonian (Aristotelian) model of the physical universe. The scholar or professional who lacks a knowledge of science or mathematics lacks the essential tools needed to adjust to the world we live in. They lack both a scientific understanding of problem solving and a scientific understanding of humankind and of the world we live in. Social leaders are untrained in advanced models of evaluation, in part because our institutions are intensely protective of the status quo. The media savors the conflict and disorder of modern life. This media and literature seem to relish wallowing in a shameless (trashy and infantile) emotionalism. Finally, the public is conditioned by the institutions of the status quo and fed with the hope that the political leaders of society understand what is needed. In this view Korzybski was well ahead of his time in anticipating the coming world of Stalin and Hitler.

Korzybski returned repeatedly to the link between mental illness and what passes as the well-trained mind today. This can be understood through the insights of general semantics. If we look at the world holistically, we can see that a model of the thinking process of the schizophrenic and that of the individual who is inflexible, dogmatic and closed-minded, share a high degree of congruence. We are all familiar with thoughtless, selfish, overbearing, unethical personalities in government, in business and in religion, and it does not escape us that there are seemingly ‘average’ yet sociopathic personalities in our midst. Our social system allows considerably latitude for maladjusted behavior. We don’t judge others, at least not out loud. We don’t want to be socially incorrect. Most people just go with the flow.

It’s not that they are evil. “Evil” is perceived as a different type of problem. There are bad people. And there are “evil” circumstances. Ignorance, it has been said, is the root

cause of such evils. We are lacking in information and proper forms of evaluation, not very clear in their thinking. In short, with the proper training we could do much better. We could be happier. We could make positive contributions to human welfare. Whether or not you consider Korzybski's system relevant depends largely on whether you think there is a crucial problem of evaluation, of thinking, we need in order to solve the problems of the world today. Lacking that basic awareness, it doesn't make any difference if you have a system or not. What we have in this new century is a lot of non-working, non-systems. People are desperate to find a solution to social problems. What they lack is a basic understanding of the problems and the type of deep training that is required to adequately respond to the needs of humanity.

Many people seem to have an intuitive grasp of the fact that our knowledge systems, our professions, our experts, and the politicians who rely on their advice, are out of touch with reality. It is becoming more and more clear to the generality of humankind that something is seriously amiss. We lack a clear grasp of the problem before us. We spend far too much of our time arguing and misunderstanding. We divide the world into democrats and republicans, conservatives and liberals, whites and people of color, Protestants and Catholics, Christians and non-Christians, male and female—abstractions that conceal the process and problems of life. We have these neat categories of symbolic expression and the symbol. The word is the thing: stereotyped images are strongly reinforced in the media. The media jades our sensibilities towards violence and suffering. Do we wonder why there is so much crime, war, abuse of children, the elderly and spouses; hunger, ill health, insecurity and unhappiness in this world? We are emotionally detached from it all but that attitude itself is a delusion: In a famous cartoon, Pogo said: “We have met the enemy and they is us.”

In short, and in summary, the basic problem with the Aristotelian system, indeed with the entire system of western thinking, is twofold: First, a conviction that a word is the thing it represents. Second, that ideas can be divided into mutually exclusive categories. This is Aristotelian logic. It is a two-value system: something is either A or is not A. It assumes the word explicitly represents the object of experience. It assumes the word and the experience are one. It is a highly "abstract" system. It resides outside the bounds of ordinary experience, detached from the reality of ordinary experience. It was a useful system to help establish scientific inquiry in the time of Galileo, Newton and Descartes but no longer addresses the realities of modern life. It is still a potent tool for practitioners of non-experiential fields: law, history, religion and even science. Today, however, we need a system that provides the tools to clearly link abstract understanding with the improvement of life and living on the experiential level, places like our home, our neighborhood, our work place; and increasingly the world. What we need is not further detachment from reality but a science that will serve direct experience of life. We need a new science, a human science.

Korzybski devoted his life to developing that science and method.

Chapter 9: The Integration of Human Knowledge

With this concluding chapter of Book 1 of *Alfred Korzybski: Principles and Practices*, I must ask where I think Korzybski was going with general semantics. Book 1 is about learning and applying Korzybski's principles and this chapter is a case study. My Book 2 goes more into the philosophical foundation of his general semantics.

Korzybski is a hard read. My objective has been to produce a more readable and applicable text. He was a technical thinker, a mathematician with a solid foundation in science, and particularly the new science informed by relativity and quantum physics. He probed deeply into human neurological anatomy. He closely studied the nature of minds poorly connected to the world in which we live. And he provided a systematic response to that problem as found in *Science and Sanity*, his other writers and lectures, and his organization.

In short, I see Korzybski pursuing a common language and a common body of work thought which to train general semanticists. No formal curriculum has appeared in the halls of academia. His proposed Non-Aristotelian Library has yet to be assembled.

This section of Book 1 is admittedly autobiographical. Korzybski died just as the computer, the massive electro-mechanical machines with glowing vacuum tubes, clicking relays and rows of flickering lights, was being born. His work I believe informed the development of general systems, and along with it, a systems analysis and operational management that has defined my career in project planning and management.

My career in information technology spans from punch cards to the internet and mobile devices. My job has been not the machines and the programs but applications and that is about improving the capacity of people to do their work. It has also been about developing cultures that embrace the impact of technological change. At the very beginning of that career, I read J. C. R. Licklider's *Libraries of the Future*. My graduate work focused on learning for action and to learn effectively requires ready access to knowledge. My first effort along these lines was the design for a learning system I called ESEX: Environment-Systems Exchange. It was also at this time that I meet a woman who had attended one of Korzybski's conferences in Denver and she gifted me with her copy of *Science and Sanity*.

To cut to the chase, from the beginning I believe that Korzybski sought an integration of human knowledge. He had a personal mastery of that ability. In *Manhood of Human*, which I review in Book 2, he coined the term Time-Binding. Humans, through language, have the unique gift of passing experience through time, generation by generation.

In *Science and Sanity* Korzybski explicitly worked to integrate a vast body of knowledge, as the bibliography confirms. He penetrated deeply into the very function of human language. A founding principle is that we must have clarity in what is going on. Equally, we must be able to communicate what we experience. Deep thinkers have worked at this problem for millennia – but particularly in this modern age, with limited success. He, and others, made it clear that our thinking was lagging progress. Einstein famously quipped that we cannot solve our problems with the same thinking that created them.

The digital era has only accelerated the rate of progress. It has produced incredible structural changes in culture, in language, in education and in the way people perceive and interact with the world outside their skin. Digital technology has had a profound impact on our perceptive and cognitive abilities; arguably not for the best. Now we move into an era of artificial intelligence and virtual reality. We have become utterly dependent on technology, industry, a global economy of incredible complexity and fragility, and a host of problems, environmental and political, that should give us pause, as it did Korzybski a century ago.

As I will demonstrate in this chapter, there was a method to this madness, and we can learn much from how it was intended, I repeat, "intended," to unfold.

Time-Binding

Korzybski called the acquisition and use of knowledge "bound time." It is about the accumulated experience of the human race. We have accumulated a lot of knowledge. We have indeed developed an incredible industry to produce vast outpourings of new information resources, the research university. Their libraries contain millions of books and vast archives of now digitally stored journal material. It has been said that if a specialist did nothing but read in their field for a year, at the end of that time they would be seven years behind. The internet has produced billions of web pages. Google and Wiki and Internet Archive and Project Gutenberg are common terms. Untold legions of people have "published" books on Kindle and other applications

I would like to start this discussion with three points. First, libraries and other information archives have always been vital for the progress of all forms of learning. Second, this is an age defined by using information; we have become "knowledge workers." Third, finding the information we need, as knowledge management experts have so clearly pointed out, can take three-quarters or more of the time involved in preparing a report or proposal.

As an information technology planner my job has been to provide ready access to and processing of information, often to serve extremely complex environments. I started my work in social research during an age of dynamic social progress, and one, I would add, during which we thought we would have an influence on the course of an unfolding human epoch. I continued in the field of economic analysis, especially of labor market economics during a period of remarkable occupational transformation, that is, with the advent and development of information technology and the transition from an industrial to a service economy. I lead a program to develop an interactive computer workforce planning system.

My first serious inquiry into general semantics was for the purpose of developing a cognitive model for information management. I find the field still, even in this day of the Internet, largely unexploited. I learned by organizing a national conference on human-computer interface that little was understood of human cognitive engagement with technology. Korzybski clearly understood that this lack of effective extra-neural connection was already seriously affecting our capacity to solve our problems and those problems have escalated by quantum leaps since his time. Today we face a perfect storm of environmental, economic, and political issues.

Two unfulfilled promises of the industrial revolution are: a) an abundance of leisure; and b) rapid access to good information. A lot of time, energy and money has been invested in "smart" governance and corporations, but the jury is still out on its effectiveness.

I will bracket this discussion with the work of two prominent general semanticists from Korzybski's day: Oliver Reiser and A. E. van Vogt. Reiser became involved in general semantics shortly after the establishment of the Institute of General Semantics (1937) and was mentioned by Korzybski eleven times in the *Collected Writings*. A. E. van Vogt was an award-winning science fiction writer and a serious student of general semantics and other cognitive sciences. He wrote a series of novels using general semantics as a theme, and in a related story coined the term "Nexialism." I have published an article about van Vogt and general semantics (link). I will use Reiser and van Vogt to open and close this discussion. Between them I will talk about the work of several important individuals whose work I believe is not only relevant but vital to the progress of applied time-binding. These include Vannevar Bush, Jesse Shera, Norman R. Meise and J. C. R. Licklider, each of whom I will introduce in turn.

Oliver Reiser

Oliver L. Reiser (1885-1974) was a professor of philosophy and the history of science at the University of Pittsburgh for fifty years. He wrote a long list of books and a number of articles, including several about general semanticists. Much of his work was dedicated to the topic of a global scientific humanism. He was one of 34 signers of the 1933 "Humanistic Manifesto." which sought to define humanism as the proper religion of humankind. Korzybski considered him a rare humanist who had a solid grasp of science. The late Bob Pula listed Reiser in a general semantics bibliography with a note that Reiser, like the Jesuit trained leading general semanticists J. S. Bois, retained a "residual mystical inclination." That 'inclination' comes out in my review of Reiser, but I find it a highly instructive orientation to the integration of human knowledge, which must, of necessity, embrace a host of marginal 'sciences,' not excluding the social sciences, which Reiser choose to add to the "melting pot." General semanticist leader Stanford Berman wrote about Reiser in his *Logic and General Semantics: Writings of Oliver L. Reiser and Others (1992)*[71].

What little biographical information that is readily available tells us that Reiser was familiar with some of the giants of the intellect of his day, including Dewey and Einstein, and many other leading thinkers, both East and West, some clearly residing on the far side of the mystical frontier. Reiser's broad knowledge resulted in one reviewer calling him a Pythagoras of the modern day. I should note that Korzybski's friend, Columbia Professor of Mathematics, Cassius J. Keyser's *Science and Religion: The Rational and the Super-Rational* (1914) and *The Human Worth of Rigorous Thinking* (1916), probed the extension of science into the "mystical" realm of contemplation. I would add that Korzybski memorial speaker (2007) Dr. Leonard Shlain, professor of surgery at the University of California, San Francisco, more recently provided insight into this crossover in his book *The Alphabet Versus The Goddess* (1998).

[71] I believe an article-length treatment of Reiser's life and work would be of benefit to understanding the history of the general semantics movement.

The Integration of Human Knowledge is a long (460 pages of small type) and densely reasoned work. I can see that whs Reiser was attracted to Korzybski. I find significant similarities in their styles. It takes a Korzybskian prepared nervous system to read Reiser comfortably. Having read Korzybski's *Science and Sanity* repeatedly, I find Reiser not only readable but extremely interesting. His book kept my mind engaged from cover to cover. I came away from this book convinced that I had engaged a formidable mind. The book is not a text on general semantics. It is a book that employs general semantics to develop an intricate argument, a theory of time-binding, and one very much from Reiser's own obviously vast knowledge.

For Reiser, the 1950's represented a time of great peril for the human race that mandated a global "culture of cooperation and social integration." Humanity must, further, achieved "the conscious control of human evolution." That can be achieved through the integration of human knowledge. Science must be aligned with the greater scope of human culture as a "unified world view." The instrument of this cause is education for, as Whitehead said "'the race that does not value trained intelligence is doomed.'" He draws further support for educational reform from the then past noting that President Truman had said that human progress depended upon "'a unified general education,'" and from then President Eisenhower who said: "'What we desperately need is an integrated, liberal, practical education for the same person,'" as opposed to continued specialization. Indeed, Reiser said, "The highest moral obligation ... is to be as intelligent and well informed as possible."

The crisis of the age (then and now) springs from an "ambivalence of the spirit," which is to say that humanity lacks a clear vision of its own nature and potential destiny. Reiser derived the essence of the human 'spirit' from the evolutionary process of the universe, from simplicity to complexity culminating in the human capacity for speech and creative imagination, here pointing to Korzybski's theory of time-binding. There must also be a clear vision: The human potential must be identified with the idea of the 'good society,' a human society based on a functional ethical system. A functional ethical system requires a powerful epistemology. Reiser, the deeply knowledgeable professor of philosophy, reviewed a number of epistemological systems. He pointed out that from time-to-time ethical geniuses appear, but they are inevitably followed by those capable of little more than an orthodoxy of institutionalized authority which has no capacity to adapt and grow. Some of these epistemologies are based on a "lack of confidence in the ability of human intelligence to actualize a vision for mankind," for example, Scholasticism (religious) and Existentialism (atheistic). Hegelian Marxism, he noted, advocates violence. Indeed, in the end, most belief systems lead to violent behavior. To correct these faults requires a workable epistemology with the power to examine and validate beliefs, that is, to evolve.

Reiser's epistemology is founded upon the scientific method. He makes a point of dismissing the supernatural in favor of science and reason. He also warns of the progress of science without due regard to its impact on society. The 'culture of cooperation' requires a "common nucleus of methods, concepts, and aspirations ... achieved through the integration of human knowledge. Currently the fields of human knowledge are not only fragmented but in conflict. There is an elementalistic separation of head and heart, of mind and emotion, resulting in a misuse of human consciousness, specifically the cortico-thalamic

integration. At best knowledge is arranged in an alphabetical format. This occurs in encyclopedias and in the departments of a university. Each department has its own language and culture. Each produces specialists who are wholly ignorant of other fields. He pointed out that there were at least 20,000 specialties at that time (1958). Libraries represent a "nightmare" that gives scholars an inferiority complex. The human mind simply cannot embrace the vastness of these great repositories (mausoleums) of print. The rate of accumulation of printed material is accelerating. At the very least two approaches can be taken to address the sheer physical mass of books: Alternative media (e.g. microfiche) and a more comprehensive indexing system[72]."

The bottom line is that we have failed to produce social institutions that attend to the matter of integrating human knowledge. This was a major theme for Korzybski. Traditionally that was the role of the university, but the universities defaulted. Ideally it is the role of the scientific enterprise, but scientific education has failed to train scientists to synthesize their knowledge "*into a unified conception of man, his place in nature, and his potential for the good of society*." We do not have the mental preparation of an integral society, "the conscious striving to produce content courses of ideas, based on the sum total of human knowledge ... a body of ideas that will be useful informing judgments, and arriving at decisions which will have broad social consequences." Reiser, it should be added, anticipated C. P. Snow's *The Two Cultures* (1959) which brought wide public attention the problem of the division, and the social consequences thereof, between science and the humanities. He went further to suggest that religious systems must be included in the synthesis as they involve a broad spectrum of human behavior.

Reiser discussed several schemes for the integration of human knowledge including those of Herbert Spencer and H. G. Wells. He reiterated that the scientific community is methodologically challenged to produce the required synthesis. He pointed out that to scientifically synthesize knowledge requires a methodology that can be applied to all fields of study. The field of biology itself challenges the scientific method[73]. The social sciences, despite decades of methodological work, are clearly outside the pale – they have no theoretical coherence. A hopeful approach he suggested can be found in the "operational research" system developed during World War II. But the bottom line is a problem in 'semantics,' and here he returns to Korzybski and the time-binding theory. Language is the essence of knowledge. We must have a universal and comprehensive language upon which to found a shared experience. He cited Wiener: "Community extends only so far as there extends an effectual transmission of information."

Reiser went into a long discussion of 'semantics,' covering much of the same ground as Stuart Chase[74] but with a clearly stated acknowledgement of the difference between 'semantics' and general semantics. Of general semantics Reiser says little more than to remind his reader that he had presented his ideas at the Second Congress (Denver) and saw no need to repeat them.

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[72] Both of which will be treated by other authors, below.

[73] Major advances in the integration f human knowledge have been made by biologists from general systems theory founder Ludwig von Bertalanffy to the Odum brother's ecosystem science.

[74] See my chapter on Stuart Chase in Anton and Strate, *Korzybski And …*

Reiser does, in fact, go far beyond Chase in both scope and depth. There are 150 pages of dense, tightly reasoned, text before Reiser again names Korzybski. He does, however, refer to principles of general semantics along the way. He manages to not only embrace cybernetics, emphasizing the feedback principle, but introduce the then quite primitive computer. He noted that Wiener had already suggested, the day when computers were still made with vacuum tubes, that the time will come when they will duplicate and even replace the human brain, as more recently argued by Ray Kurzweil and others.

Reiser dwells at length on the work of Russell and Whitehead, Leibniz (universal language – a calculus of reason) and other, emerging, fields (like cybernetics and computers). He looked at von Bertalanffy's work in biology regarding the application of the second law of thermodynamics to life[75]. He discussed the relatively new field of gestalt psychology[76], made an important clarification of "intuition" which he reframed as 'insight, and pointed to the emergence of an "electromagnetic society" of planetary scale[77]. He spoke of a phenomena called hysteresis (the effect of a field on objects within it), mnemic[78] causation (intensification of consciousness) as it relates to the synthesis leading to Korzybski's time-binding theory, and other things.

Still only a little beyond mid-way in the book, Reiser reached a time-binding synthesis based on the spiral of development. He arrived at this point by developing a synthesis of mind and universe. He defined mind as occupying the middle ground, between the cosmos and the micro-cosmos, intimately tied to the web of existence through interaction feedback[79], defined by the principle (Mach and Milne) that "the mechanics of a single body is determined by all other bodies in the universe." He established mind as an emerging quality of the brain, concluding: "As I have constantly insisted, however, the human organism exhibits its time-binding properties, and so a special theory of time and integration is required if we are to correctly represent the progressive organization of mental functions."

Many writers, it should be noted, have used the spiral as a symbol of evolutionary development[80] but few have, as Reiser did, explain it in terms of the increasing angular momentum of accumulating time-bound energy, the increasing energy that expands the spiral as it progresses through time. Progress occurs only where the resonant, reverberatory, function obtains in the workings of the human nervous system. Don Beck and Christopher Cowan developed a metamodel of evolving human social styles in their bestseller *Spiral Dynamics* (1996).

If we allow our capacities to remain dormant, Reiser pointed out, we are only partially human. Fragmentation impedes the development of these capacities. Specialization does, in fact, promote a "false theory of human nature," thwarting the pursuit

[75] This work provided a cornerstone to systems theory.
[76] Gestalt therapy founder Fritz Perls studied general semantics and commented on it favorably.
[77] Long before the likes of Peter Russell and *The Global Brain* (1983) which has achieved virtual cult status. See also Howard Blooms *Global Brain* (2000)
[78] Suggestive of a DNA-like organizing structure.
[79] Reiser uses the term "reverberation circuits" which is probably lost on generations who know only modern modular electronics. Such circuits were part of the training of radio enthusiasts into the 1960s. Such circuits act to amplify signals to which they are tuned through a feedback mechanism. This is akin to the phenomena of the feedback squeal often heard on public address systems, albeit of a more precisely controlled nature. Korzybski used the principle earlier with his Structural Differential.
[80] Originally conceived by Mary Boole as the "spiral action of time." The fundamental phenomenon of spin is a part of this theory.

of human potentiality. Integration of knowledge depends upon "the intellectual unification of ... principles [and] harmonization of the cultural interests in art, religion and politics." He returned to the scientific method and stated that there is only one such method. He challenged the social sciences: if the method doesn't work as expected he suggested that the social scientists do not properly understand the method to start with. Science, however, is a human phenomenon and rests entirely on cultural factors. That alone should encourage the sociologists to bring their field into the scope of science.

To unify knowledge requires an all-inclusive framework, a frame of reference, a worldview. Such a framework must be cosmic, that is, universal in scope. It must include the entire universe from cosmos to the sub-microscopic. It is a matter of interacting fields yet each human (mental field), here referencing Kurt Lewin, represents an intellectual hurricane. There must be a goal and before the goal there must be a cosmology from which the principles of a "good society'' can be drawn. We must be conscious that the cause of the change we experience is man-made. The unconscious function of our brains, a prismatic cortical analyzer that "breaks up the harmony of the cosmos into many separate chords" must be understood and brought under control.

Returning to the evolution of life, he pointed out that the early collective organism lacked a central coordinating faculty (brain). The world today is like such a low-grade organism – lacking a central nervous system. It needs a mind, a world brain formed around a scientific humanism (value system). This requires a loyalty that transcends nationalism and other ideologies. This loyalty is to a universal system of principles which alone can guide us to social cohesion, a loyalty to a planetary destiny, a commitment to growth though tension and trial. It requires a 'creative semantics,' a map of the future, "A map of a territory to be." Creative thinking is, indeed, feeling our way through the universe to a "time-binding synthesis, a field-plenum dynamics of history." We are drawn[81] along the path of maximum excitation (tropism). Our potential may be defined as "the emerging social cortex of an embryonic world organism."

Is humanity capable of self-transfiguration? The fall of man, according to William Blake, was the original sin of the separation of reason from feeling and imagination, head from heart, which Korzybski addressed with cortico-thalamic integration. Specialization has imposed mental shackles on our creative potential. We require not only a new formulation of knowledge but a new art, a new form of visual expression. Reiser linked "the plenary cortex of the world sensorium" with the evolution of computers and electromagnetic medium. He emphasized the role of choice, of thought and deliberation, of setting goals. He emphasized that the entire earth[82] is a single living, interdependent, organism, noting the power of demographic energy, that is the increasing interaction of larger numbers of people involved on a planet that is apparently becoming smaller every day. He concluded that the psychic unity of humankind will come through the formulation and adoption of a scientific humanism that will be given the power of religious belief, in fact, be adopted as a new world religion.

It would seem, on the surface, that Reiser warrants Pula's caution about a "mystical inclination." His approach tends to the metaphysical, but I find that it is in the sense of the

[81] Induced, that is drawn through the inductive process of generalization of higher orders of abstraction.
[82] Quoting Dr. C. H. Rice, anticipating Lovelock's "Gaia and the biosphere.

meaning given to the word by Bucky Fuller, which in essence suggests no more than the next level of abstraction. Reiser's language has the sound and flavor of religion, but I find his careful qualifications of religion and mysticism warrant close consideration. As I've noted, his attempt to bridge the chasm between science and religion is strongly congruent with Keyser's book on the subject in 1906. Korzybski's work came out of his understanding of the tragic imbalance between science and technological progress lacking an appropriate human value system to guide it and preserve and promote the well-being of human society. Reiser clearly and strongly echoed that concern. He attempted, with rigorous thoroughness, to provide that integration.

VANNEVER BUSH

Vannevar Bush (1890-1974) was, I would argue, a Korzybskian man. He was an electrical engineer with a doctorate from Harvard and MIT (jointly). He taught mathematics and electrical engineering at MIT. He was involved in the development of the vacuum tube for radio communication, four-engine bombers, the atomic bomb, a network analyzer (to test power transmission systems under strain), and a host of other inventions. Perhaps his most remarkable invention was the "differential analyzer," an electro-mechanical computer which was used during World War II for solving complex differential equations (up to 25 sets of data at once) for problems ranging from ballistics to atomic energy. In 1922 he co-founded a company to market a new and improved radio tube that became Raytheon.

Bush quickly rose to full professor at MIT, became dean of the School of Engineering and was appointed a vice-president of MIT. In 1939 he assumed the job of president of the Carnegie Institute where he was given authority to invest large sums of money into scientific research in a diverse range of fields. He was a member of the National Advisory Committee for Aeronautics and chaired that group from 1939 to 1941. At the outbreak of World War II, he took his case to take on the challenge of coordinating scientific and technical research and development to President Roosevelt and won approval with a twenty-minute presentation. He was appointed chairman of the National Defense Research Committee in 1940 which became the OSRD (Office of Scientific Development and Research) the following year. OSRD coordinated the work of 30,000 scientists and engineers working on 200 critical weapons, such as the proximity fuse and Norden bomb sight and mass production of first sulfa drugs and then penicillin. He was a consummate manager who knew how to delegate and formulate effective policy. His style was one of clarity, rigorous thinking, simplicity, an eloquent and masterful command of English, and a strong and forceful personality.

Bush was also director of the Manhattan Project until it was taken over by the Army in 1943. After the war he wrote a proposal for the formation of a civilian research department that became the National Science Foundation. In 1947 Bush was named chair of the newly formed Research and Development Board established by the National Security Act to continue the work of promoting and coordinating research and development in the interest of national security. He started with nearly a half-billion dollars in funds. That year he was also appointed a member of the board of directors of American Telephone and Telegraph (upon which he served until 1962). He remained chairman of the Carnegie

Institute until 1955. From 1957 to 1962 he was chairman of Merck and Co., the pharmaceutical corporation.

Bush grew up with the great surge of technological advancement. He was fascinated with progress and dedicated his life to the advancement of education, research, and most importantly, the coordination of "A gigantic tidal wave of human ingenuity and resources, so stupendous in magnitude, so profound in its thoughts, so fruitful in its wealth, so beneficial in its results, that the mind is strained and embarrassed in its effort to expand to the full appreciate of it" (Otto Lilienthal). Humanity he saw as a technical species. Engineering and mathematics he saw as the tools of its development. He took great joy in the study of science and engineering and mathematics and committed himself to discipline and mastery. *Atlantic Monthly* compared him to Emerson's "The American Scholar."

Bush, in fact, hated metal laziness and casual pursuit of any subject. He saw the need for scientists and engineers to climb out of their ivory towers and get their hands dirty. He eagerly tackled the administrative duties so many academics shunned. But he saw, above all, the need to fit the pieces together, to make a coherent and unified front for scientific progress. He was personally dedicated to a strong national defense and came to play a central role in the vast capacity of the American war industry to produce the overwhelming might it put into the field on all fronts, planes: ships, land vehicles, weapons, communications, medical treatment, etc., etc. Among these, as noted, the atomic bomb.

Bush's inventiveness is legendary. He undertook a wide range of projects. He was a pioneer in radio, and he was also a pioneer in computers. His differential analyzer was an electro-mechanical analogue computer with 150 electric motors. Norbert Wiener spent a lot of time with the analyzer and with Bush. Ironically, when Weiner proposed a digital computer in 1940 Bush opposed it. He doubted that a mass of 18,000 vacuum tubes could be made to work (it did so only with hours per day of down-time for maintenance). But he also asserted, to the end of his life, that digital machines would not be able to build a tangible model (an analogue) of the real world. Bush also hired a graduate student to support the analyzer named Claude Shannon, "father of information theory."

Bush had other contrary views. After the war he opposed the ICBM and rockets for space exploration. He didn't think atomic weapons could be made small enough to be carried by a rocket or that rockets could be made accurate enough to be used as a weapon or for manned space exploration. He also considered space exploration far too hazardous. In retrospect, it is doubtful that computers would have become of great social importance had it not been for the invention of the transistor to replace the vacuum tube and ultimately the large-scale integrated circuit upon which the modern computer is built. It is also doubtful that space exploration, or the ICBM, would have been possible without those advancements in electronics and computers.

Bush's greatest difficulty came, however, in the area of human relations. He was an elitist, a strong and forceful and immensely able personality. These were winning qualities with Roosevelt and his brain trust. After the war, however, he offended the more homespun Truman crowd. He believed that progress was achieved through the work of good minds, well trained and provided with adequate resources to pursue science and engineer great and useful works. In this regard he was not far from the idealization of van Vogt's Nexialists

or Null-A agent, or for that matter, the scientific and mathematical elite Korzybski envisioned. Some say he outlived his vision but perhaps history simply failed him, and Korzybski, and others who foresaw the growing peril of the times and the need for exceptional leadership to manage human civilization.

Germaine to the topic of the integration of human knowledge, is an article published by Bush in the *Atlantic Monthly* in 1945 entitled "As We May Think." It earned him the title, "the godfather of information science." In that article Bush proposed a device called the Memex, a desk-sized 'library' containing the whole of human knowledge recorded on microfilm. Bush apparently wrote the first draft of the article in 1939. He wrote that "Unless we find better ways to handle new knowledge, as it is developed, we are going to be bogged down." He saw the library as the "bottleneck" of research. His first approach was one of condensing the vast bulk of information into a manageable and readily reproducible format. Microfilm was already being considered (since 1926) by librarians as an alternative medium. About 1930 H. G. Wells had suggested a microfilm format for his "World Brain/World Encyclopedia." Science fiction writer's future libraries had books on rolls of film. Microfilm images were little fingernail-sized, photos of pages and this process was developed as a recording format to the point that the microdot became a fabled spy device by World War II. Bush proposed that a dictionary could be reduced to a single, foot-square, piece of film.

Both Wells, himself a serious student of technology and human advancement, and Bush pointed out the need for a better index to information. Memex was intended to do that. Memex was specially designed to augment, that is to amplify, human intelligence. It was not only a comprehensive library but an aid to personal memory. It would improve the quality of thinking by allowing nearly instantaneous access to voluminous textual information. But it did something else far more important. Bush believed such machines should be for the purpose of aiding human creativity (not running an organization as most computers were and are still employed).

Indexing troubled Bush. He blamed librarians for enforcing their unnatural systems. Bush wanted the library to model the human thinking process, particularly association. He wanted scientists to develop a system more consistent with the function of the mind – an approach Korzybski would have undoubtedly applauded. He believed that only a thorough study of the human thought process could determine how to build a "dynamic index." He proposed the idea we now know as hypertext: a technique for mapping information, for linking topics, for adding notes and commentary and other material, which could be retrieved at will and shared with others.

Bush returned to MIT in 1955 and retired in 1971. He died in 1974 at age 84 after suffering a stroke. He had received ten honorary doctorates and a large number of medals and awards. The National Science Foundation, based largely on the details of his proposal for it, established the prestigious Vannevar Bush Award in 1980. More importantly, he left an enviable legacy.

My assessment of Bush as a man of heroic proportions comes from a number of factors. He had, first of all, a powerful intellect and had a great imagination. He was secondly trained rigorously in mathematics and engineering. Further he was a

self-disciplined and driven individual. Third, he did not hesitate to take on administrative and managerial functions. These indeed defined his life. He was a master manager. Fourth, he was an inventive genius who relished practical work. Fifth, he had a vision, a brilliant vision of human progress to which he committed his entire life. Sixth, he was a personable and dynamic leader with extraordinary communications skills. Seventh, he had no fear of stepping forward with his ideas. Indeed, the record of his life demonstrates that he was a champion of causes and possessed the personal endowments to achieve his objectives. He was, it might be said, a warrior, or at least a master strategist devoted to the creation of the tools of war. He had a not inconsiderable part to play in the creation of the American military machine of World War II and the foundation of the scientific enterprise upon which modern armaments are based. That he misestimated a few trends that have come to define twenty-first century history may be dismissed by the fact that what he did foresee provided the foundation for much of the advancement of science and technology that defines our life today.

J. C. R. LICKLIDER

A name largely unrecognized even within the community of information technology today, but who played a leading role in creating it is J. C. R. Licklider (1915-1990). Licklider, like Bush, was a Harvard and MIT product. His first academic interest was physiological psychology (brain function) and came to focus on the auditory process. He received a doctorate in psychoacoustics at the University of Rochester in 1942. He then worked at the Psycho-Acoustics Laboratory at Harvard from 1943 to 1950, when he moved to an associate professorship at MIT. He developed maps of neural activity.

During World War II, he worked on the effect of noise on the performance of bomber crews, particularly communications. He flew in B-17 and B-24 bombers to frigid altitudes of up to 35,000 feet to conduct his experiments. He was a gifted mathematician, an equally brilliant laboratory researcher and talented mechanic. He was an excellent mechanic who could tear down and rebuild an automobile engine. He was an expert on vacuum tube circuits and built complex electronic devices to aid his work. He became increasingly involved in human factors, today known as 'ergonomics, specifically the cognitive interface between humans and their environment, and particularly the emerging electronic and computer environment. After the war he worked on SAGE (Semi-Automatic Ground Environment), a computer-driven system for monitoring air traffic for the Air Force (which was later incorporated into commercial flight scheduling and reservations). SAGE was the first interactive computer system. It was the first example of what he considered a human-computer 'symbiosis.' He also became increasingly interested in using computers to process the massive amounts of statistics required for his experimental work. But his leading interest was communications and he saw computers primarily in the role of a communication technology. He became a leading expert in the field of visual interaction and champion of computer graphics. He developed a reputation as an extraordinary problem solver. In 1958 he was elected president of the Acoustical Society of America.

At MIT Licklider became intensely involved with computer research. He knew Bush and his Differential Analyzer. He was inspired by "As We May Think.". He was close to Norbert Wiener and the two spent many hours in deep dialogue. He also took every opportunity to attend open sessions with John von Neumann. Licklider was a psychologist

rather than a mathematician or physicist. He knew another psychologist, actually a psychiatrist, Warren McCulloch, who was very closely involved with Wiener and von Neumann. In 1943 McCulloch and Warren Pitts wrote a seminal article entitled "A Logical Calculus of the Ideas Immanent in Nervous Activity." The article was based on their study of neural networks and presented the first computational theory of mind and brain. They employed Turing's idea of the "Turing Machine." Wiener and von Neumann were intensely interested in this work and they met often with McCulloch. Von Neumann developed his architecture of the digital computer from McCulloch and Pitts' work. These conversations so formed the foundation of Artificial Intelligence.[83] McCulloch also wrote a book, *Embodiments of the Mind* along these lines. Licklider was, naturally, deeply influenced by this mind-machine dialogue.

Licklider became intimately familiar with IBM (that built the SAGE computer system) systems engineering and development. In 1957 Licklider left MIT and accepted an invitation to become a vice president at Bolt Beranek and Newman, Inc., (BBN) an acoustical design company. He joined them just as they took on the job of designing Lincoln Center. He set out to bring BNN into computers. He first bought an expensive ($75,000) vacuum tube-based computer he soon denounced as "a hunk of junk." Digital Equipment Corporation (DEC) loaned him there very first (serial number 1) PDP-1[84], which he then purchased. It was a transistorized machine with an interactive console interface.[85] It cost twice as much but ran 1,000 times faster. He was one of the first to demonstrate the idea of time sharing, that is multiple users of a single computer, and attracted a group of "hackers[86]" who waited in line for time on his machines. He began to realize that such computers were becoming powerful enough to support Bush's ideas for a computer-based library. He spent long hours writing programs for these computers and became an established expert in the nation's small community of computer scientists.

Licklider worked to link the computer to human cognitive processes. In 1962 he published a seminal paper on the human-computer interface. That year Licklider was named Director of ITPO (Information Processing Techniques Office) under the newly formed DARPA (Defense/Advanced Research Project Agency). He had $4 millions of uncommitted funds and a virtual freehand on how to award them[87]. By default, he became the lead coordinator of interactive computer research. It was only a question of who to give the money to. He had a large network of associates, especially his buddies at MIT. He reached out to the best computer scientist of the day at universities and a small number of corporations, a group he knew well. His first attempt to launch a brainstorming session at MIT, however, ended much like the story Korzybski told of the animal researchers: Rather than address their needs, they went for each other's throats. This wasn't his only prospect. He had the funds for maybe ten groups, and he made a list of prospects. He headed to California and found arguably his most important discovery, Douglas Engelbart.

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[83] Licklider later worked closely with Marvin Minsky.
[84] Developed and taken to market by an MIT colleague.
[85] This computer was about the size of two household refrigerators versus the house-sized facilities for the mainframes. See description below.
[86] A hacker was originally a model railroad enthusiast who used computers to model complex railroad switching problems.
[87] Sixty percent of his ten-million-dollar budget was already tied up in a batch computing project (typical for large mainframes but he hated batch computing).

Engelbart was an electronic whiz-kid who worked his way to a degree in Electrical Engineering. He had spent two years during World War II as a navy radar technician. In 1950, recently married and holding a good job in an orchard belt that would one day be known as Silicon Valley, he set himself a life goal. He started with the recognition that mankind's problems were developing faster than they could be solved, and that an electrical engineer like himself might make a difference in addressing this rising tide of difficulties. He sketched his vision of a CRT display which would help resolve these problems. A natural line of thinking for a man who had spent endless hours watching and making sense of radar screen displays, Engelbart begin to develop a graphical computer interface: "a computer-powered information environment," or more precisely "'augmenting the human intellect.'"

Engelbart decided to get his Ph.D. but found, first, no interest in his ideas in academia, and second, to keep a low profile at SRI where he next went to work. He found his vision actually damaged his reputation as a reliable scientist. Meanwhile he ran up a long list of patents related to his research. He worked for two years to complete his manuscript on "Augmenting the Human Intellect: A conceptual Framework," completed in October 1962 just as Licklider started at DARPA.

While still in the Navy he had read Bush's "As We May Think" in a base library in the Philippines. He adopted Bush as his "patron saint," and that article was very much in his mind as he developed his idea nearly two decades later. Bush had designed a system for putting all human knowledge at one's fingertips. Now the problem was how to most effectively manipulate all that knowledge. Engelbart knew he had to create a new discipline to advance his work and proposed an "Interdisciplinary Knowledge Augmentation Laboratory," exactly the type of entity Licklider was looking for. Engelbart's vision was highly congruent with Licklider's. Licklider gave Engelbart a small but important grant to start his work.

Engelbart took his vision to the world in 1968 at the Fall Joint Computer Conference in San Francisco before an audience of 2,000 engineers and computer enthusiasts. Alone on the stage, but with a dozen people keeping the pieces of his fragile system in operation behind the scenes, Engelbart put on a two-hour demonstration visible on a projected computer screen. At his right hand, next to his keyboard, was a device called a "mouse," a small wooden box with wheels underneath, a button on top and a wire (tail). On screen Engelbart could divide his workspace into a number of "windows," each displaying a different set of text or graphics in a domain called then an "informationscape," a topology of information[88], through which he piloted his audience, narrating the adventure in a quiet voice, building, linking, expanding and developing the sets of data; a map, complete with a self-reference to the event currently underway. At the end of his presentation, he received a standing ovation[89]. This is what Licklider had the money to encourage.

There are a number of good books on the history of the emergence of the personal computer and Licklider's name can often be found featured prominently in many of them. He was something like an orchestra leader. Licklider deliberately and successfully set into motion projects that gave rise to the modern computer. Doug Engelbart was only one of his

[88] And today "cyberspace."
[89] Engelbart continued to develop his vision. See his web site at www.bootstrap.org.

discoveries. He carefully selected his principal investigators and then organized them into a working community. Most were familiar with his ideas and devoted to pursuing interactive computing. He hand-selected his successor, the second in a line of capable DARPA administrators who continued to develop projects he had envisioned. One of the most important of his projects, of course, was the ARPANET. Another was his work to set up departments of computer science and engineering that now define the IT field.

Licklider's interests were broad and comprehensive. He wanted to expand access to computers, to make them effective time-sharing devices, and, far more importantly, to develop an adequate interface to truly augment human intelligence. His contributions were his personal research, funding of projects while at DARPA, protégés, organizations and networks. Knowing that there was much more than he could do personally during his short stay at DARPA, always a proactive agent, he set up his Intergalactic Network, to ensure a strong foundation for development of the computer as a tool for human advancement. Nearly a decade later he would be back at DARPA for another short run as architect of the computer revolution. But that is another story. Now I want to return to Licklider's pioneering work in the integration of human knowledge.

At one point, Licklider stopped to evaluate how much time it took him to collect the information he needed for his work and concluded that he spent 85% of his time in nonproductive activity finding the information he needed to prepare to do his actual work. In 1965 he published *Libraries of the Future*. It is a short and easily read book. Having said that, it is a book about computer science and engineering. The book came out of a two years research project, ending November 1963, centered at Bolt Beranek and Newman, sponsored by the Council on Library Resources. The topic of the research was the design of the library circa 2000.

Licklider's first task was to define the "schemata" of "'transformable information.'" In short, what information in libraries could be converted into a computer format and how would that be best achieved. He excluded art and similar visual media and concentrated on books and other printed media. The schemata of a library is a page of printed information which Bush had acknowledged as a marvelous way to display information. Further, these pages are bound into books, which represent a more difficult media, and housed in vast libraries which are a decided challenge to accessing needed information. The goal: "We need to substitute for the book a device that will make it easy to transmit information without transporting material, and that will not only present information to people but also process it for them, following procedures they specify, apply, monitor, and, if necessary, revise and reapply. To provide those services a meld of library and computer is evidently required." He listed the criteria of the computer 'page' and then discussed the necessary components of the computer that would provide the necessary service. He then calculated the size of a book in terms of a computer word, or bits (bytes today) and, from that, the size and rate of growth of books in libraries.

I would like to reiterate that the computer technology he was then familiar with, indeed, the state-of-the-art, was the recent PDP-1, "mini"-computer. The PDP-1 took up seventeen square feet of floor space. The circuitry was the then new solid state (transistor)

format. It required no elaborate cooling or air conditioning[90]. By comparison, the then current IBM 700 series computer required a large, air-conditioned room. The console consisted of a CRT and an IBM electric typewriter which served both input and output. Memory store consisted of up to the equivalent of 144 kilobytes of core memory[91]. Options included magnetic or punched-tape drives and a line printer. The machine cost $120,000 which was considerably less than the rent on an IBM machine for a year. The PDP-1 was the first interactive commercial computer. This machine was used, I might add as a humorous aside, for the first computer game, called Spacewar[92].

Licklider examined the process of human acquisition of knowledge, especially in the process of laboratory research. He then outlined the criteria for a 'procognitive system.' It begins with a "desk." The desk has telecommunication and telecomputation ability (remote time sharing). It had a CRT screen, a keyboard, and a light pen (which he invented). He considered the economic value of developing and deploying such systems, including the prevalence of pro- vs. anti-intellectual forces in society. In short, the procognitive system must add value. He listed 25 specific criteria for such a system. High on the list is: "Make available a body of knowledge that is organized both broadly and deeply – and foster the improvement of such organization through use." Prominent on the list is the need for programming and heuristics. There were no user applications at the time. In difference to the then limited storage media he proposes an architecture of four levels, with remote (dial-up) terminals at the bottom and at the top a few massive "echelon 1" systems that would maintain the "total fund of knowledge." However, a second and third echelon would parse out knowledge into definable sub-fields. This was not in full accord with Bush and Reiser in terms of a total integration of knowledge, but nonetheless well ahead of them in a realistic estimate of the then limits of computer hardware. Access would be interactive.

Licklider "expected that computers would be capable of making quite "intelligent" contributions by 1994. He anticipated advances in "artificial intelligences" by that date[93]. He hoped for a color textual display (CRT). He used the light pen and a flat display for interactive graphs and charts. He predicted handwriting recognition. He hoped to see significant advances in memory and memory organization and anticipated magnetic and optical media. He hoped for program languages that would give not only associational but high-order relational memory capability.

Much of his book was devoted to consideration of developments in computer technology not from the standpoint of hardware and software as from that of the theory of the organization of computer-based information, a field that might today be called "data administration." High on Licklider's list is the "Man-Computer" interface. He coined the term "symbiotic" interface early in his career[94]. Given the then truly primitive state of computers, programming languages and executive (operating) systems, I find Licklider's foresight truly awe-inspiring. In 1968 he wrote another seminal article, "The Computer as

[90] Ample documentation of the PDP-1 can be found on the internet.
[91] Core memory consist of a pinhead sized magnetic ring, each representing a bit of data, through which three wires run which switch it "on" or "off" providing a random access binary memory. The first desktop computers of a decade later came with from one to four kilobits of memory and audio cassette storage media.
[92] Spacewar can still be found and played on the internet.
[93] He was well familiar with friend and colleague Marvin Minsky's work on artificial intelligence.
[94] Having worked in the field of human-computer interface, I am astonished at how little actual advancement has been made in a half century.

a Communication Device." Also, in 1968 he became a full professor of Electrical Engineering and director of Project MAC which developed a full-scale time-sharing computer system.

The successor to Licklider at DARPA was Bob Taylor. Taylor had been a systems engineer working on ballistic missiles. He was a disciple of Licklider's human-computer symbiosis. He only had a master's degree and found that an impediment working with the academic research scientist. He went back to work for industry and was hired by Xerox to set up a computer research laboratory in Palo Alto, the Palo Alto Research Center, or PARC. PARC is a story in itself worth reading[95]. Under Taylor's guidance PARC developed a host of devices including: Laser Printers, desktop computers with graphic user applications, the Ethernet card (which at first was to have been wireless), a tablet (laptop) PC and a personal digital assistant. They actually built and sold 1,500 desktop computers, the Alto II beginning in 1975. The Alto II was a $12,000 machine but possessed then most of the features of the current run of personal computers[96].

Xerox management saw little value in PARC. One perceptive senior executive was able to salvage the laser printer, which became a billion dollar a year business, but Xerox failed to develop the personal computer and IBM stole the show. Ironically, Xerox attempted to buy into a little computer company run by two young computer entrepreneurs, Steve Jobs and Steve Wozniak who owned a company called Apple. Jobs had no use for the inflexible corporate giant and the partnership was short lived. He made a tour of PARC. The legend has it that Apple adopted PARC technology. In truth Apple was already developing its Lisa computer from which the Macintosh was derived.

Perhaps it is my own admiration of the principle of tradition, and love for a good story, that leads me to regret that we spend so little time with our time-binding genealogy. In truth J. C. R. Licklider played only one small role in the pageant of the development of the computer. It was, however, a vitally important role and one well played. Bush, Licklider, and a relatively small number of other creative geniuses, working over a period of decades, brought the modern digital computer into existence. I call this process "hard thinking." Without such strenuous mental effort, we would likely not have developed what we know today as the field of information technology. I find that story alone one of the most compelling and insightful of the history of science and technology. I find it so not because of the importance of computers in the evolution of our global civilization but in the raw fact of human creativity. The story of the creation of digital technology is no less compelling than that of the creation of the science of relativity, quantum mechanics, atomic energy, string theory, etc. I don't see why the likes of Licklider and Bush and Engelbart should not be given equal importance to that of Bill Gates', the Jobs' and Wozniak's, and all the other celebrated founders of industry. Waldrop has written a fine biography on Licklider[97] and Rheingold[98], among others, has written a fascinating book on the history of information

[95] Michael Hiltzik, Dealers in Lightning.
[96] During the mid-1970s, Wang produced a desktop computer with a table radio-sized box of transistorized electronics, a one kilobyte block of core memory, expandable to 4 K, an audio cassette for storing programs, and also an IBM Selectric typewriter wired for input and output. Wang soon introduced a CRT version. I learned to program it in Basic.
[97] M. Mitchell Waldrop, The Dream Machine: J. C. R. Licklider and the Revolution That Made Computing Personal.
[98] Howard Rheingold, Tools for Thought: The History and Future of Mind-Expanding Technology.

processing that highlights the roles of Bush and Licklider. That this work resonates with Korzybski I find compelling.

But now I want to look at the work of two librarians who worked to meet the computer scientists and engineers from the other side of the isle.

TWO LIBRARIANS AND THE AUTOMATION OF LIBRARIES

My two librarians are Jesse Shera and Norman R. Meise. A Google search for Shera gave 10,300 hits. For Meise only seven, mostly Amazon listings for his book, an expensive one. By good fortune, I first found it at a library discard sale. Shera's influence was considerable and noteworthy. Meise's little book, as I will demonstrate below, is another of those lost treasures of the time-binding mausoleum.

Jesse Hauk Shera (1903-1982). After receiving his master's degree in English, he worked at the Scripps Foundation where he conducted population studies for ten years. There he became familiar with perforated cards and related tabulation equipment. He attended the Graduate Library School (GLS) at the University of Chicago and obtained a doctorate in1944. After war service in Washington D. C. where he served as Deputy Chief, Central Information Division, Research and Analysis, Office of Strategic Services (precursor of the CIA). There he began his work on mechanized retrieval of information. After the war he went back to work for GLS until 1952 when he was named dean of the School of Library Science at Western Reserve University (later Case Western Reserve University) returning to his native Ohio. At Case he established a doctoral program and taught for two decades. He was a student of the history of libraries and the theory of classification. He continued research on information retrieval.

In 1952 Shera took over leadership of the American Documentation Institute (now American Society for Information Science). When he arrived, the focus had been on microfilm. He changed the focus to computers. In 1955 he co-founded the Center for Documentation and Communication Research (CDCR) which advised government, industry and higher education on information technology and formulated the system of library access and retrieval systems now in wide use. CDCR contracted with General Electric in 1959 to develop the first electronic "search selector."

Shera was motivated by the belief that librarianship and scholarship were endangered by the information explosion. He also realized that his work was creating a split in the library community, a split between "little old lady" librarians in tiny or tradition-dominated venues and the demands for advancements in documentation access in research universities, businesses and government. Shera, possessed of a humanitarian vision of librarianship, worked to bridge the widening gap between librarianship and information science. Like the division between mind and body, he saw the chasm between the tools and resources of the library and the ends they served and worked to bridge it.

He collaborated with Margaret Egan on bibliographical organization and together (it was apparently Egan's idea) developed "Social Epistemology," e.g., the epistemological foundation for library science and librarianship. In other words, it was the study of the collective nature of knowledge, a field formally created in 1987. The idea is that knowledge is essential social. It was an interdisciplinary approach. They began exploring the use of

automated libraries together in the 1950s, when the idea was considered ridiculous, and pursed the work to the end of their careers.

Norman R. Meise's *Conceptual Design of an Automated National Library System* was published in 1969, just four years after Licklider's book. He makes no reference to Licklider, or Bush or Shera. He does reference Licklider's collaborator Verner Clapp and the MIT Project MAC. The book is in typescript. It is thoroughly researched and highly documented with tons of data, charts, and tables.

There is very little biographical information about Meise. I was able to ascertain[99] that he was born in Pittsburgh, Pennsylvania in 1925 and died at Northport, New York in 2000. He was an engineer and worked for some time at Pratt and Whitney Aircraft in Connecticut. He would have thus been 44 years of age at the time of the publication of the book the style of which suggests it is a professional proposal.

The feature that first caught my attention is that his design employed an optical disk storage system. Meise observed that the size of library holdings, both books and journals, doubled between 1938 and 1964 and that our ability to generate information exceeds our ability to retrieve it. An automated library, or at least an automated access system, is the logical solution. He cited interest in automation of library service going back to 1950. He used NASA as well for an example. NASA had stored some 160,000 documents, with 16,000 descriptors, on magnetic tape. It required nine reels of tape. It was a serial search format and thus took a long time to search. He cited a number of other defense and space contractors using similar approaches. They were all slow and unresponsive to user needs. A random-access approach was the solution. He cited the MIT Project MAC as the best current approach.

A national library system would have to meet a range of patron needs running from children to serious academic researchers. Specialized, including academic, libraries systems he judged simpler than those that would serve a broad public. They also tend to be better funded. He reemphasized that the rapid growth of shelving is both limiting access and overwhelming the library system. He analyzed the current library infrastructure, cities greater than 35,000 people, in considerable detail. Outlining the major library functions, he said automation could be of benefit in all areas. Indeed, the ability of the system to gather information on usage would vastly improve the entire profession of librarianship. Meise went into considerable detail on the basic functions of library management. In contrast to current modes of library management he outlined the functions of regional center operations, an entirely new management paradigm. He provided statistics on search methodologies with flowcharts for each function.

Meise stressed that his conceptual design was "Not a future "dream concept." The design was within the limits of current capability, albeit the cutting-edge state-of-art. His focus is on bibliographic retrieval (search). It is a dial-up (telephone), distributive network served by broadband connection. The computers are located in regional centers. Access is made to them from local libraries via CRTs. Even the smallest village library could have a CRT or teleprinter console. The system would eliminate duplication of effort, reduce the

[99] Through the aid of my master genealogist's wife.

demand for printed books, reduce routine library chores and provide greater flexibility in meeting patron needs.

Meise pictured the local library from a patron's point of view. He criticizes library systems "developed by librarians for librarians." Indeed, he would leave little professional librarianship at the local level. Patrons would have direct access to a user console with assistance from library staff as needed[100]. Librarians could thus focus on being of assistance to patrons, not handling books. Patron interaction would be through natural language and interactive, much like Google and Wikipedia today. Meise, like Licklider, portrayed an actual interactive dialogue[101] between the patron and the computer (for Licklider a professional researcher, for Meise a citizen). With collections centralized in regional libraries (except for a relatively small number of general circulation books on hand locally) the patron would have ultimate access to all books in the national library system. Books would be shipped on a one-to-two-day basis. Circulation statistics would improve the availability of books to meet patron demand. Patrons would obviously be much better satisfied with library services.

As an example of the function of the regional network, he chose the State of Connecticut. Three, perhaps four sites in this network, including the state library and regional library centers, mostly at universities, could serve the needs of that state. This Connecticut library "system" contained some six million titles between them with about 2.4 million in general circulation. He proposed a search record for each item in the library. Each record, he estimated, would require about 1267 characteristics. The general circulation books would thus require about 3 billion characters (bytes) storage. The collection of journals, each article recorded, for five years, would represent another 120 billion characters. Stored on magnetic tape, the entire record would require just under 100 hours to access the full range of records. That of course was not going to work. There were a number of alternatives and he then compared tape to drum, cartridge and array storage systems.

Meise found only one system potentially capable of effectual access to the regional library records, the optical ITEK Memory Centered Processor (MCP). This storage device consisted of ten-inch transparent discs each capable of holding 25 million characters. On a national scale, disks would be stored in a "jukebox" array, 5,200 discs in trays of 650 discs each. The Connecticut regional system would need only a fraction of this capacity, about 300 disks. Access to any disk is 1.5 seconds with an average access time of 15 milliseconds per record. The MCP was then only in concept stage[102].

After a schematized discussion of the indexing system, Meise estimated the distribution of national regional centers, based on population distribution, and established 69 prospective localities with National Library Central located at the Library of Congress. He designed a completely automated library structure for the Library of Congress. He also ran through its library management responsibilities. He then returned to Connecticut to map the distribution of local libraries and design a circuit layout. His proposal included a

[100] Circa 1980 there were in fact briefcase-sized terminals with sockets for a telephone handset to connect to distant mainframes. We've come a very long way.
[101] A far cry from relatively simplistic current library or internet search procedures.
[102] This represents the storage today on a pocket-sized portable hard drive.

detailed tele-communication plan for the circuit route with allocation of communication traffic. He included in his plan the needs of major industry, government and public services. Meise concluded the book with a chapter on a detailed systems analysis and another on systems implementation. He added detailed appendices of library statistics, analysis of communication traffic, complete with a long list of assumptions, and a bibliography of literature cited.

Meise concluded with a list of six major items:

1. The critical need for improved library service.
2. Current technology was sufficient to achieve his proposal[103].
3. His proposal would represent a significant advance in library service and should be implemented as soon as possible.
4. The library system must have random access to at least one hundred billion characters (gigabytes – flash drive size).
5. The Memory Centered Processor can meet this need.
6. A success system depends on an integrated approach to design, development and implementation.

As a veteran information technology planner and project manager, with a significant background in data communication and client-driven information services, my overall response to Meise's proposal, and that is how I read it, for its time, is AWESOME! True, it is not a digital library, but it was a then (1969) state-of-the-art practical, thoroughly researched and documented, plan for a system that would give every library patron in the country access to every circulating book, bibliographic citation for all reference works, and all major magazine and journal articles for the last five years, to start. Today, we have instant remote access to the holdings of libraries across the country[104]. There are also a number of online book services for both new and used books and a number of digital libraries such as Internet Archive.

Meise brought to the subject both an evident expertise in librarianship and in computer engineering. He approached the system from the perspective of an average library patron. He also offered to the library profession a solution to mass storage of printed material, to acquisition, to checkouts and overdues, to statistics, to improved public service and satisfaction, and to a more dynamic role in the building of the nation's time-binding resources. This would be costly, for sure. Funding would have to be found to set up the system, not only the information system but the management and distribution systems. The reduction in books and storage shelving would have paid a great deal of the cost. There would also have been a reduction of jobs, especially for paid librarians in small libraries. Like Shera and Licklider and Bush, Meise was obviously a humanitarian with the welfare of the public and the advancement of society foremost in his considerations. Jobs can be shifted and phased out in a humanitarian society. The public would be better served. Public services would be more efficient and cost effective. A profession would be advanced by a quantum leap. He was prophetic.

[103] A desktop computer or a single server card could handle the system today.
[104] Increasingly, however, e-books are also available through libraries and on-line sources, many at no cost.

MUSINGS ABOUT LIBRARIES AND AUTOMATION

Advances in library automation, especially the on-line "card catalog," have been of incredible value. The internet has also been a boon, with qualifications. It provides access to information but is a trial in terms of finding the information you want and finding information that is verifiable, that is, accurate and reliable. A query for "general semantics" (in quotation marks) resulted in 904,000 hits (nearly tripled in fifteen years since I first recorded it). Without the quote marks it was 81,200,000 hits (a six-fold increase). While it is true that an increasing number of books have been digitized, by services such as Internet Archive and Project Gutenberg, we are a long way from digital libraries after a half-century. They are isolated documents just as paper books are. Digital books have taken a major part of the market (but the print book industry continues to flourish). Digital readers and portable devices, tablets, and phones, have become a common medium. Public libraries are providing a growing share of digital content.

There is still much work that needs to be done to achieve the now 'ancient' criterion for a fully digitally integrated library. In my own work on this problem, a Universal Digital Library (UDI) project named Polymath, there are three standards that must be met. First is the digital media itself, the storage of the entire corpus of human knowledge in a public repository. The goal is now achievable. Second is access, a random, fully Boolean access to content. Popular search engines have only limited Boolean capability using the standard terms such as "and, or, not." Third is the accuracy, reliability, "truth" if you will, of the content of the document. Much of the internet content is, in crude terms, 'crap.' Much of it is commercial – sales pitches. Much of the content was written by journalists, fans, amateurs and special interests. Much of it is self-seeking, e.g., motivated by infantile behavior. It does not enjoy the standard of peer review. Misinformation has become a byword of digital media.

There was once an inexpensive search engine called Gopher. Gopher was fully Boolean. It allowed search for words or phrases, including a specification of the closeness of their appearance of two or more words/terms, that is, same paragraph, within a certain number of pages of each other, etc. It retrieved text and not merely document specific results. It would scan a PC drive almost instantaneously. It is what Bush envisioned a lifetime ago.

A collateral problem is how to put all the information you find together. This involves some questions of structure and indexing that go back to Bush and others – how to organize what you find. Applications have been developed but this topic can use more work. Along with Polymath we considered a tablet device that would incorporate not only the hyper texting features of Bush's Memex, but many of the ideas from Licklider, Meise, Shera, van Vogt, and for that matter Bucky Fuller and Ralph Borsodi, and others, about the structure of knowledge and the human cognitive process. Korzybski had much to say in this. We called the approach Psynergetics (Psycho-synergetics).

A related product that was a tremendous success in its own unexpected way was a Macintosh program called Think Tank. Think Tank was a wonderful, flexible, dynamic way to organize one's thinking. It was in outline format with drag and drop. Such features are now embedded in word processors. The outline is, of course, an ancient literary device.

Every child learns to make outlines in school. Outlines are the fundamental form of organizing everything from receipts to Dewey Decimal and Library of Congress classifications. Organizing masses of notes, is another art. I will touch on this again briefly below.

Products like PowerPoint, Keynote and Google Slides provide for graphic illustration and presentation. These products have become a standard for business, academic presentations, and for learning in general. They are powerful tools for organizing information. But a common complaint is "Death by PowerPoint." I once attended a workshop given by 3M back in the days when slides were presented on overhead projectors. 3M makes film products, including the foils used for slides. This was for sure a marketing ploy to encourage the use (sales) of their product, but the heart of the workshop was the cognitive psychology of presenting information, that is the dos and don'ts of making effective slides and slide presentations. Today, the rule for presentations, at least outside of academia, is 10-20-30: Ten slides, twenty minutes, 30-point type.

The eye, as Korzybski made clear, is a powerful perceptual tool. Proper visualization is effective. PowerPoint is a medium between the outer world and the inner. General Semantics provides a powerful tool for making such presentations cognitively coherent.

I have used Korzybski's principles and practices over my career to increase the effectiveness, and reduce the training time of employees, and to develop corporate culture around digitalization. Sometimes it was no more than reducing an office application to a short list of key functions, one side of one sheet of paper. Too much of this environment is technical and abstract, the gap between technologists and the people they serve is huge. It requires a translator. The end-product must readily and transparently serve the needs of the user. Steve Jobs was a genius along this line. Bridging that gap, a virtual mind-body split, requires a dramatic enhancement of communications and organization.

Towards the end of my active career in information technology, about the time I completed my *Alfred Korzybski: Time-Binder* manuscript, I worked with state-of-the-art human computer interfaces. I organized a conference of leading thinkers in the field. After listening to presentations, I often met with the presenters and asked them if they had ever heard of Alfred Korzybski. None had. I was able to give each a reason to read Korzybski. I was able to find some point in Korzybski's work that bore on theirs. Many, unaware of the crucial genealogy of their own work, of their debt to those who had preceded them, were spending time, money and the better part of their careers trying to learn something Korzybski and other mentioned in this chapter could have given them important insights.

We return, as we must, to the problem Korzybski undertook, the function of the human nervous system. Several of the authors and studies cited above have pointed to the need for a better understanding of the function of the human nervous system in the process of learning. Korzybski laid that foundation. The scientists, engineers, and librarians I have written about showed tremendous creativity. Some pushed the limits of technology to the edge of the human nervous system. All sought to some degree to augment human intellectual function. Many were contemporaries of Alfred Korzybski. We have had decades to develop a general systems/general semantic synthesis, but with limited success. As they

say, when things are not going well, it's time to go back to basics. We do not, as I hope this chapter demonstrates, have to reinvent the "wheel." Much time has been bound.

A. E. van Vogt and NEXIALISM

I return to a general semanticist, A. E. van Vogt, for my final thoughts on the integration of human knowledge, that is, applied time-binding. Van Vogt was a science fiction novelist of considerable fame during his life, one of the leading writers of the Golden Age of science fiction. He was a dedicated general semanticist. He was also a committed practitioner and organizer of a psychotherapeutic modality through which he hoped to develop higher human functionality. His non-fiction books include one, co-authored with a medical doctor, on hypnosis, and one on human violence. His fiction books provided a first introduction to general semantics for an untold number of people. A biographical sketch of his life and work is available the Link[105], and JSTOR[106].

Within the general semantics community, van Vogt is known particularly for his three "Null-A" (non-Aristotelian) novels in which his heroes are practitioners of a field explicitly named 'general semantics.' He wrote another book I have included in his corpus of novels, *The Voyage of the Space Beagle* (1950). In that book he proposed a science he called "nexialism" which he defined as: "The art of joining, in an orderly fashion, the knowledge of one field of learning with that of other fields. It provides the techniques for speeding up the process of absorbing and using effectively what has been learned."

In short, the story is about a large interstellar space exploration vehicle, the *Space Beagle*" filled with some of the best scientists alive who encounter a peril to not only their own lives but the fate of the Earth. The learned specialists are neither able to control the peril on their own or coordinate their efforts to do so. Elliott Grosvenor is a product of the new school of Nexialism and is able to save the day.

The genealogy of nexialism is not entirely clear. Van Vogt made no explicit connection between Nexialism and general semantics. He had a habit of doing extensive background reading, up to 200 books, for each of his novels. Even with his extensive knowledge of general semantics and the additional reading he did for the Null-A novels, which he said were his most extensively researched, the general semantics he described in is very different from Korzybski. One must, however, consider that van Vogt projected his general semantics 500 years into the future which allowed for a considerable evolution of science as well as general semantics. In those novels he has the science fiction devices of intergalactic spaceships, death rays, controlled atomic energy, and a man with an apparently genetically altered double brain who is able to make fuller usage of general semantics. The function of that double brain starts with Korzybski's own device for integrating two human brain functions, the thalamus and the cortex, and semantic relaxation. Van Vogt also described a vast, sentient, computer, a "world brain," and a repository of human knowledge which was used to shape and refine the mental abilities of the citizens of a general semantics society. Like Reiser, there is a 'taint' of the mystical or

[105] https://www.thefreelibrary.com/A.+E.+van+Vogt+and+the+World+of+Null-A.-a0141051359
[106] https://www.jstor.org/stable/42578600

metaphysical in van Vogt's considerable works, including his general semantics novels[107]. *Space Beagle*, I would argue, is the least metaphysical of this group.

Space Beagle was written before Reiser's book. It could be argued that nexialism was based as much on Whitehead, who van Vogt deeply admired, as on general semantics. From my own reading of Whitehead, I tend to doubt that he is the primary source of van Vogt's inspiration but, having said that, must admit there are some sound suggestions in Whitehead's work in this regard. It could also have its origins in operational research, but I am not sure.

Operational research I see as a great interest for general semanticists as it does have an interdisciplinary approach based on solid scientific and mathematical reasoning. It has a solidly established professional presence and is widely used in business, government and higher education for the management of complex projects in general. Another name for operational research is "management science." Management science works primarily in the domain of business.

Operational research was first formulated in the 1930s and found its first widespread application during World War II. The foundational principle of operational research is the scientific method. It is closely allied to industrial engineering. It relies heavily on statistics, game theory, queuing theory, optimization, simulation, decision theory, etc. It was used to accelerate war research and for the development of weapons, tactics and logistics. Cornell professor Mark Eisner called it "the most important field nobody's ever heard of." But he added that you can't take the kids to Disneyland without operational research getting you there and back and arranging everything in between. Computers provided the muscle to make operational research a widely practice methodology.

I think that Alfred Korzybski was a workable archetype for van Vogt's Nexialist Elliot Grosvenor. Korzybski pioneered the art of combining many fields of knowledge for the purpose of developing general semantics. He labored through a large number of content areas to find a common vocabulary of expression for the formulation of a general semantics. From the 55 names to whom he expressed his indebtedness, to the massive bibliography of *Science and Sanity*, he displayed an incredible breadth of learning. He could range from differential equations and matrix calculus to colloids, to psychoanalysis, history, education, philosophy, medical science, engineering, etc., etc. We find the vast breadth and depth of his learning in *Manhood of Humanity*, his lectures, the collected writings and most particularly *Science and Sanity*.

From Korzybski's earlier writings I find a number of intriguing suggestions about the genealogy of 'Nexialism.' He wrote, in *Manhood of Humanity,* about the human engineers and their qualifications. Like van Vogt's Elliot Grosvenor, they are "hard-headed" men and women, a cadre of teachers, fearless in inquiry and expression, who are willing to bear the condemnation of their fellows, as did the founders of modern science. Human Engineering, Korzybski realized, would go against the grain. He said of them that they use a language with a structure similar to their work, to the world of natural reality. Politicians, on the other hand, use a language with little relevance to human reality. It is in part

[107] Bob Pula, who was a lively and humorous thoroughgoing secular humanist, indicted van Vogt's novels "notorious." Van Vogt would have refuted that. He too considered himself a committed secular humanist.

because the language is static while the world of reality is dynamic. It is also in part because of the two value, Aristotelian, system of politics. Such a language cannot possibly support a dynamic social system.

While the degree to which van Vogt was indebted to Korzybski is uncertain, it is perhaps of greater importance to me because I have had a copy of van Vogt's definition of Nexialism near at hand my entire professional life. It is the cornerstone of my philosophy of science. It thus has a meaning to me and that meaning has its roots in Korzybski's general semantics.

Korzybski's Synthesis

We have been able to achieve extraordinary results in science and engineering because these fields have developed special languages that reflect what is actually going on in the world. Progress in those fields has advanced exponentially. But a lot more work is required to create a holistic science of 'man.' Korzybski had already begun to build his universal, Non-Aristotelian, library. He mentioned that an "'International Library of Human Engineering' (Principia Scientae Hominis)" was being established in New York City, under the 'editorship of a mathematician and engineer with an advisory board of scientists from all countries in all branches of science'." It contained five sections: Scientific Method; Mathematics; Mathematical Philosophy; The Theories of Relativity; and The Newer Physics; and Psychiatry. He listed 74 authors, a number of them with multiple publications. He emphasized once again that an organized group must undertake this effort. It is more than one man [himself] can do alone. He further stated, in precise language, that the study of "psychology" must involve "man as-a-whole, and *all* the forms of his behavior."

I will review a selection of passages from Korzybski's work that points in the direction of a field like nexialism. This list is far from exhaustive. I use it not to justify van Vogt's formulation of nexialism but to lay the foundation of the integration of human knowledge from Korzybski's perspective. The origin of this thesis is, of course, non-elementalism. Man is an "organism-as-a-whole in an environment." His conscious awareness is the result of a common neurophysiology and its function defined by the structural differential. It is experiential and extensional. It derives from a definition of 'man' as a time-binding class of life. It requires a "general" rather than "Restrictive Anthropology." That is, "It would include all disciplines of human interest from a special anthropological and semantic point of view" (*SS*, 39). He congratulated Spengler for approaching such a general anthropology. It requires a four-dimensional language, a common language understood by all. He observed: "This is a very serious difficulty, particularly when many branches of knowledge are drawn upon, as each uses its own special language; so that such a unitary translation in terms of structure imposes a serious burden on the memory of the translator" (*SS*, 43). Korzybski related how he began his synthesis without realizing the difficulty involved in the inherent differences, exploring "many branches of science which were never connected before" (*SS*, 44). Thus, he learned many languages, the special jargon of each discipline into which he enquired.

Regarding the scientific method, and I would like to reiterate that Reiser made the excellent point that there is only one scientific method, Korzybski wrote that "a number of isolated facts does not produce a science any more than a heap of bricks produces a house.

The isolated facts must be put in order and brought into mutual structural relations in the form of some theory" (*SS*, 55). That requires the use of special languages and terminology. In this regard he explained why the popularization of science is difficult, "even semantically dangerous." There is an underlying structure that is similar to the structure of the world that cannot be perceived through the medium of ordinary language. He set out to develop the language of that underlying structure. This requires a linguistic revision. It requires the creation of a universal language, a systematic reevaluation of all fields of knowledge and a foundation science of sciences.

General semantics represents a non-elementalistic language. It eliminates the Aristotelian division of "'mind' and 'body,'" "'emotions' and 'intellect'" (*SS*, 93). In part the differences are doctrinal, metaphysical, and involved system-functions, indeed "el creeds," by which the uniqueness of each discipline is defended. Korzybski undertook "an independent investigation as to the ways they *mutually intertranslate*." He stressed: "Let me again repeat, that the mixing of different languages of different structures is fatal for clear 'thinking.' Only when a system is traced to its system-function, and the many implications worked out in their *un-mixed* form, can we make a further *independent* investigation of the ways in which the different systems intertranslate" (*SS*, 147). General semantics itself represents a new "systems-function." He would later explain that his work, undertaking a fundamental reevaluation of the many fields he studied, resulted in a "rediscovery" of many basic principles of science and mathematics. Continuing: "History shows that the discovery of isolated, though interesting, facts has had less influence on the progress of science than the discovery of new system-functions which produce new linguistic structures and new methods" (*SS*, 148). Here he cited Einstein's fundamental, non-Aristotelian, non-elementalistic, breakthrough, the science of 1933 upon which he draws as a methodology for integrated his understanding of 'science,' … "a deeper structural, epistemological and semantic simple aspect" of knowledge of the world. He rounded this point up with: "The non-el point of view makes us postulate a permanent connection and interdependence between all psycho-logical aspects" (*SS*, 148-9).

The foundation of the non-Aristotelian system is "mathematics as a language similar in structure to the world in which we live … the maze of often unconnected knowledge we have gathered in the fields with which this part is dealing is so tremendous that it would require several volumes to cover the field even partially … "It is a common experience of our race that with a happy generalization many unconnected parts of our knowledge become connected; many 'mysteries' of science become simply a linguistic issue, and then the mysteries vanish … Structure alone is the only content of knowledge" (*SS*, 247).

"All languages are composed of two kinds of words: (1) Of names for the something on the un-speakable level, be they external objects., or internal feelings, which admittedly are not words, and (2) of relational terms, which express the actual, or desired, or any other relations between the un-speakable entities of the objective level" (*SS*, 250).

"The prevalent complete disregard of the fact that these issues are linguistic and structural makes the advances in these fields very slow and halting, and only so-called 'geniuses' are capable of breaking through these semantic barriers. Once the linguistic character of the issues is fully realized, the psycho-logical, semantic blockage is removed, freedom of analysis is inwardly established, and even 'non-geniuses' will produce

important creative work" (*SS*, 327). In linking science and sanity, that is sanity and the integration of human knowledge, Korzybski added: "The suggested extension of the reaction vocabulary would allow us, at least, to apply a uniform physiological language to life, man included. We should have a general language for life and all activates, 'mind' included, of a structure similar to the known protoplasmic and nervous structure, not excepting the highest activities." (*SS*, 339).

Coming to Korzybski's "Concluding Remarks," the last chapter of Book II, we find, in a breathless elaboration, a form of a manifesto:

> *A Ā civilization will require a unification of all existing human disciplines on the bases of exact sciences. This unification will require all scientists, mathematicians, physicists, and psychiatrists included, to become acquainted and fully to practice Ā standards of evaluation, A Ā revision would have an international and interracial application, requiring a very thorough revision of all doctrines, a better acquaintance of specialists in one field with the accomplishments in other fields, and an up-to-date epistemology. If we try to disregard epistemology consciously, we delude ourselves, as we cannot eliminate some epistemology as a foundation for our methods of evaluation, and, therefore, unconsciously retain some primitive epistemology which through inappropriate standards of evaluation, introduces semantic blockages" (SS, 554)*[108].

We must have an epistemology and it must be free of the pollution of bygone ages. To these ends, Korzybski declared, the International Non-Aristotelian library and the International Non-Aristotelian Society have been formed "for a revision and, therefore, a co-ordination of all existing sciences and concerns of man."

Korzybski was not done. He appended Book III to acquaint the student of general semantics with some of the fundamental principles upon which he based general semantics. It should be pointed out that Korzybski undertook the difficult task of synthesizing mathematics because he did not believe that assigning a large number of books would enlighten his reader. He also pointed out in this third book that it is intended as something of a 'test' and a conditioning of his reader's nervous system. The going should be expected to be hard but the nervous system would thereby be prepared for the arduous task that just begins with *Science and Sanity*. He had an end in sight. He wrote: "The main problem is to trace this semantic disturbance of improper evaluation in all fields of science and life, and this requires a new co-ordinating scientific body of many specialists, with branches in all universities." Their meetings "would stimulate enormously scientific productivity. The first task, then, is to find a co-ordinating principle and present it to the scientific world (*SS*, 567-8)." He invited his scientific and mathematical readers to take the lead in preparing papers to guide other members of their local International Non-Aristotelian Societies. From this effort, undoubtedly, a universal science of man would emerge.

The value of any learning is the effect it has on subsequent behavior. Korzybski cited any number of authorities who address this question. Carrel and Spengler are two prominent ones. P. W. Bridgeman's operational philosophy had an influence on both Korzybski and general semanticist Anatol Rapaport. Rapaport, as noted, developed his own "operational philosophy" which he defined as "what to do and what to observe in order to bring the thing defined or its effects within range of one's experience." Rapaport was

[108] I believe this is at the root of van Vogt's formulation of nexialism.

concerned with the problem of relating how people think about the world to how it influences what they do about it. Operational activity, Johnson noted, is when one regards one's behavior as a technique and not as a trait. Korzybski also quoted Santayana: "People cannot love one another unless they love the same ideas." There is implied in all this a common body of knowledge. The extent of the spread of that common body of knowledge defines a community of interest.

In his 1937 lecture Korzybski said that statistics predicted that in 200 years there will be no sane man left. His new science of man, built on the extensional (physico-mathematical) methods of general semantics will prevent this nervous degeneration. The solution, he said, was in language, in disciplined training and in application. "The human tragedy today is that we have endless knowledge, but we never apply that knowledge because the new knowledge cannot be applied by the old two-valued internal orientations. … In General Semantics we apply what we know … There is not much use in teaching physics, mathematics, etc., if there is no application, no human application." It is infantile to learn anything 'for itself.' Further, the nervous system must be taken as the organism-as-a-whole. There is an outer environment and there is a "neuro-linguistic and neuro-semantic environment." These must be integrated. He related how Carrel believed it would take 25 years to train the type of mind necessary, in the many fields, to counter the degeneration of human society. Korzybski responded that he had already developed the science and the training and that it would take little time to train general semanticists.

At the time of the Second Congress, at the University of Denver, Korzybski lamented that University members in faculty meetings, all specialists, even members of a common field, have nothing in common, no general method to approach a problem. This has lowered the effectiveness, as human beings, even of scientists. Philosophers have also failed in their responsibility to humankind to establish a sound foundation for knowledge. But not all have failed. In a comment (*Selected Writings,* pp. 507-512) about Gustaf Stromberg, Korzybski cited a quote, Einstein's own response to Stromberg's book *The Soul of the Universe*: "'What especially impressed me was the successful attempt to isolate the essential facts from the bewildering array of discovered data and the presentation of them in such a way that the problem of the unity of our knowledge acquires a meaning. The attempt to unify our knowledge is in any case commendable at a time when almost everyone forgets the whole in the investigation of the parts.'" Stromberg, Korzybski noted, used data from astronomy, physics, and biology, including electro-colloidal data, genetics, neurophysiology, etc.,

A FORTUITOUS NEXUS

In the process of making a small reconnaissance into the decade following Korzybski's death I was able to find a delightful link between my thesis of the integration of human knowledge and not one but two of my subjects in this chapter. When I became aware of Warren McCulloch as a psychiatrist instrumental in the design of computer architecture, a friend and collaborator of von Neumann and Wiener and cited no less than six times by Reiser, and a professor at the University of Illinois, I was of course curious to know if he knew of Korzybski's work. I was delighted to learn that McCulloch was the Alfred Korzybski memorial lecturer in 1959, an event reported in the *General Semantics*

Bulletin, Numbers 26 and 27, 1960. His topic was "What is a Number, that a Man May Know It, and a Man that He May Know a Number?"

McCulloch was introduced as a faculty member of MIT. He majored in philosophy and minored in psychology as an undergraduate at Yale, took an MA in psychology at Columbia and then an MD "for the purpose of understanding the nervous system." He taught psychiatry at the University of Illinois. He went to MIT in 1952 "to work on the circuit theory of brains." In his lecture he related an outline of the history of philosophy from Aristotelian and Platonism to Russell. He spoke of his study of neuro-networks and logic function. He presented a rather detailed presentation of probabilistic logic. His work was interdisciplinary (Nexialists if you will), involving physiological psychology, mathematical physics, psychiatry, neurophysiology.

William Exton, in his introduction, pointed out that "we are doomed to ultimate futility unless man can apply his accumulated knowledge to life," a theme McCulloch developed exquisitely. Russell Meyer in a concluding remark spoke about "how closely what Dr. McCulloch has written relates to the work of Alfred Korzybski."

Following the AK Memorial lecture came the Colloquium. In a photograph of the participants at the head table we find Dr. McCulloch head-to-head with Marjorie Kendig and at the other end of that table Jesse H. Shera, Dean, School of Library Science, Western Reserve University" in deep conversation with Russell Meyer. I found Shera listed as an honorary trustee of the Institute.

During the Colloquium Shera had spoken on "Social Epistemology, General Semantics and Librarianship." He spoke about the nature of knowledge, its sources, methods and limits of validity, and of the topic he developed and sponsored called social epistemology, essentially a variation on time-binding. Shera spoke of the use of computers in libraries. He suggested that the mind-machine interface was a new route for human evolution. <u>But he cautioned that the human nervous system must remain the ultimate pattern of all content and that society must avoid becoming subservient to the machine.</u> He concluded with the statement that librarianship and general semantics should be natural allies, that both were interdisciplinary to the highest degree, both vitally concerned with the utilization of knowledge by the human nervous system, both deeply involved in language, symbol, abstraction, conceptualization and evaluation, both fundamentally epistemological. He added that librarianship could contribute valuable new insights to general semantics particularly regarding the structuring, organization, and availability of human knowledge. To librarianship, general semantics could contribute the fruits of social epistemology which should be the very foundation of librarianship, lacking which librarianship, he said, was little more than a respectable trade. He concluded, perhaps ominously, that if librarians failed to raise to the challenge of providing coherent knowledge to the modern world, then general semanticists might assume that role by default.

A PERSONAL CONCLUSION

Korzybski returned time and again to the question of "what men actually do as time-binders." My aim in this last, long chapter, has been to point in a direction I see as an extremely fruitful field for developing applied time–binding, or if you like a Nexialism. I want to conclude by making three points:

1. General semantics provides a solid epistemological foundation for the pursuit of human welfare.
2. There is a critical need for tools to integrate human knowledge and augment human intelligence.
3. The execution of any effective creative activity to further the interest of the human race requires a dynamic active agent.

It has been my hope in this book to provide a summary, a high-level map, of the principles of general semantics as presented by Alfred Korzybski from 1921 until the end of his life. My intention was to provide a chronological sequence of his presentation with special reference to certain points he repeatedly emphasized, especially near the end of his life. The fact that he returned to *Manhood of Humanity* itself represents, in my view, a significant reemphasis of the core idea of his work, time-binding. While I acknowledge that Korzybski's personal interest was the research and development of his field, I also believe that his principal objective was to create a new field of human endeavor, call it human engineer if you like. He labored arduously to train nearly 2,000 people in his methods in hopes that they would apply them to their own field. He clearly argued for a unified, generalistic, comprehensivists if you will, approach to the human enterprise.

The idea of a comprehensive knowledge base to support rational planning and management is certainly not new. The Greeks may be credited with the idea of creating 'philosophies,' or organized systems to aid in understanding life and pursuing the good society. Up to the time of the Enlightenment it was possible for a single individual to have a generally comprehensive understanding of the whole of human recorded knowledge. Thomas Jefferson acquired a comprehensive library of some 4,000 books and pamphlets, that became the beginning of the Library of Congress. He said he read most of his books at least twice. The French worked on a comprehensive encyclopedia, a single set of volumes that outlined the entire range of human knowledge and enterprise. As knowledge has continued to accumulate, like everything else, at a geometric rate, it has become increasingly important to find a way of organizing and accessing it. With the advent of computers, we have a tool that can provide nearly instant access to vast stores of recorded knowledge. Much of this chapter has examined the movement to automate knowledge. To date, however, no single fully automated library, by which I mean its entire content is digital and randomly searchable by Boolean logic, has been constructed. The means exist but the need has not been either practically or economically established. I find this lack of progress unfathomable. For many years, I have explored both the design of a "Universal Digital Library" and a human-computer interface to make it work transparently. There are thousands of scientists and engineers schooled in the necessary knowledge and methods but only an undercurrent of actual development. These ideas still seem "ahead of their time."

Finally, from 1921 to the end of his life, Korzybski constantly stressed the need for a trained class of professionals to carry on his work. He saw in that profession men and women trained not only in methods and knowledge but in the improvement of the function of their nervous systems. The individuals I have discussed in this chapter represent, to a greater or lesser extent, what I consider models of the active agent needed to salvage and guide the progress of our faltering civilization. I call such men and women "Korzybskian."

They may know little of general semantics, but they are the class of geniuses that Korzybski so often wrote and spoke of. Robert Green provides an excellent portrait of such creative individuals in his book *Mastery*. It will take a large, tough, capable, and determined bunch to do this job. The authors I explored in this chapter were extraordinary and historically significant personalities. Each were high achievers. Each left marks on history, or at least important footnotes. They may have been forgotten. Mindless generations, hurling down the roller coaster of a deteriorating humanity, rushing pell-mell towards Korzybski's fear of a rapidly diminishing sanity, have come to define this arguably terminal stage of history, much as Spengler believed. They are forgotten because society at large lacks a time-binding orientation. They have little conception of the reality around them and lack a common language. Indeed, the human race largely lacks a vision of either its true nature or destiny.

Each of my subjects was a generalist. Each had the capacity, the will, the desire, and the rebellious nature to go against the grain of specialization and embark on careers of discovery and creativity. To me they are an inspiration. I would add to their ranks the likes of Maslow and Bucky Fuller[109], both Honorary Trustees of the Institute of General Semantics. Maslow's self-actualized personality is an individual fully engaged in a broader world, unconcerned by conventional constraints. The self-actualized personality is an integrated personality capable of masterful creative expression across multiple disciplines. Fuller constantly railed against the specialist. His ideal was the comprehensivists. His two volumes of *Synergetics* represent a masterful work on integral, systems, thinking.

Most of my career has had to do with the development of professional levels of work and competence in interdisciplinary fields. Much of it has been in IT project management which by definition is the management of extremely complex human environments. I have come to think that the recognition a fourth sector of the economy is desperately needed. There are three sectors of the economy now, each related to a major mode of production: Agriculture, Industry and Service. The fourth sector would consist of those able to coordinate large and complex social, scientific and technical enterprises. Such individuals do exist and have lived throughout history. They are Nexialists, generalists, comprehensivists, 'geniuses,' entrepreneurs, occasional politicians, generals, social heroes, etc. Nonetheless, they are not recognized as such. Too, they are not trained as Korzybski and others saw they needed to be. These men and women are the geniuses of Korzybski's human engineers, but not recognized or encouraged as such. They are not seen as the next higher level, or sector, or mode of production if you will, necessary to form the 'nexuses to shape the human enterprise. They need to be brought under a common umbrella and joined in a common enterprise, trained in a common school, a common language and base of knowledge, and acknowledge by society as true leaders in the human enterprise as Korzybski stated in simple terms the better part of a century ago.

Most of my life I have been involved in working with or forming teams and small organizations. Some of those projects were extraordinary experiences. At no time, however, have I seen one of these teams operate at anywhere near optimum 'human' performance, at least in terms of my understanding of that standard from my study of general semantics and the human potential. I have met individuals who had achieved such extraordinary levels of performance, men and women like those Maslow met and wrote

[109] Fuller I suspect one far more profound than he ever admitted.

about. But even he lamented that they represented only a fraction of a percent of the human race. Such people always served to inspire and to assure me.

When I first begin to synthesize a chapter on general semantics many years ago, and before that when I used it to formulate a holistic philosophy of the social sciences, it was clear that I was pursuing the goal of augmenting human performance. My work with this book is to do no more than to lay the foundation of a more comprehensive philosophy of human potentiality we may be a little closer to achieving than in 1921, 1933, 1950, 1964, or any other milestone date you chose. There is much yet to accomplish

Some Cautionary Thoughts

My caution is about dependence upon digital resources. Korzybski was plain about the value of extra-neural storage of knowledge. There is no question that there is a tremendous amount of material and the volume grows rapidly. We clearly need applications that reduce the time needed to access what we need in order to solve our problems in real time. But what are the consequences?

I've been engaged in information technology from the time of punch cards and batch processing to distributive computing, the personal computer, from DOS to windows, local and wide area networks, the internet, and now portable devices, that give us access to the world in our pocket. Along with the hardware came application and, frankly, social networking and games seem to be the dominant demand. Virtual reality and artificial intelligence are on the stage. What will the effect be of this technology on human cognitive competence?

The work I have described in this chapter is about the idea of "augmenting" human intelligence, not replacing it. And by replacement I don't mean AI but rather the subtle conditioning of the human mind, the dependencies, and addictions it forms, one application after another. The effect it has on our very capacity to evaluate is one we must consider seriously. A lot of research has gone into this problem of the past decades, but it falls into the background. It goes against the grain of economic interests.

These technologies, like a long list of their predecessors starting with the telegraph, have had tremendous social impact. They have also had psychological impact. Korzybski was keenly interested in the fact that technology had, already in his time, outstripped the capacity of the human mind to cope with.

Korzybski chose to work not on the external dynamics of a dynamic culture but rather on our inner qualities – how the human nervous system processes perception and conducts evaluation. My work has been less in developing the technology than in applying it. That involves not only individuals who need the knowledge and skills necessary to do the work but also the culture of organizations that have shifted from typewriter to computer and cyberspace. My work has thus been more psychological and sociological than technological. My development of this book speaks to my belief that we need, as Korzybski asserted, the tools of general semantics.

Language, as Korzybski brilliantly described, is a product of the human mind. After birth we learn a language naturally. Then we go to school and learn more, for better or

worse. We can learn several languages. Korzybski was fluent in six languages, growing up with four of them. Tolkien not only knew a lot of languages, but he also invented new ones.

Language is a fascinating subject. It can be elevated to a high level of art in literature and poetry. Many disciplines are devoted to it. There are about 5,000 languages around the world and untold dialects. There are different scripts, some alphabets others not, grammars, phonetics, dictionaries, encyclopedias, philology, etc. Languages are written from right to left, left to right and top to bottom. Mathematics and music are languages. DNA we have come to describe as a language of four letters. There is a special language to theater. There are grammars of the arts and architecture. Christopher Alexander developed an architectural "pattern language." Professions and specialists have their own jargons. There are also sign languages and a growing list of international symbols. At base, they are all expressions of a common neuro-physiology.

The problem is that we have a Tower of Babel. We are divided by our language. Winston Churchill quipped that the British and Americans are two great people divided by a common language. Many nations have multiple languages. Attempts have been made to devise shared languages such as Basic and Esperanto. English is currently the language of international aviation. Korzybski set out, with *Manhood of Humanity*, to develop a language for the peace table. General semantics was his framework, one that goes to the depths of the nervous system that makes us human.

We, of course also have the problem of self-delusion, the Red Queen Syndrome – believing a half-dozen impossible things before breakfast. Insanity is a delusional state. But so too are many ideologies. That is what Korzybski sought to address. So did Ralph Borsodi in his problem-centered approach to education, a system based on a comprehensive taxonomy of ideas, ideals, and ideologies; three categories he took great pains to define. His systems are based on these problem statements, more fully described in his *Seventeen Problems of Man and Society*, explicitly not on subject organization. The first four of his seventeen problems are:

> **Part I, Noetics**: Four Basic Intellectual Problems.
>
> Problem I: Anthropic: The riddle of human nature, the problem of the nature of man's own nature.
>
> Problem II: Ontoic: The riddle of the universe, the problem of the nature of the world in which man finds himself.
>
> Problem III: Etiologic: The riddle of historiography, the causes of the events which constitute the history of the world and the individual experiences constituting every biography.
>
> Problem IV: Epistemic: The riddle of communication, the problem of distinguishing between truth and error and of verifying and validating and communicating what is true. Formerly an axiological problem.

A summary of his work can be found in my book *The Essential Ralph Borsodi*.

Korzybski pioneered neurolinguistics. A great deal has been learned about human brain function since Korzybski's death. Some have roots in his own work. One such is NLP, Neuro-Linguistic Programming. It is founded on the simple principles that there are, first, three primary perceptual functions, which Korzybski defined: Sight, hearing, and touch.

Each of us has a dominant function. Second, the body and language usage reflect how those functions are being used. There are fundamental structural differences in the way each type uses language. NLP, at its best, is a tool for establishing the rapport needed to communicate[110].

Building on the use of language, I think it is beneficial to reflect on its history since writing was invented. Long before written language, people employed symbolic representations. Those symbols have meaning that speak to us today. In many of these is an expression of beauty not exceeded in the best art of our day. With writing, it appears that we rewired our mental function, if not genetically then by conditioning, a very natural form of conditioning.

With the alphabet, Leonard Shlain explained during his Korzybski Memorial Lecture, emphasis is on the left cerebral hemisphere, arguable at the loss of functions that reside in the right hemisphere, the side that senses patterns and works with emotions. A lot of books have been written about using both sides of our brain.

Regardless of the script, these little squiggles of letters and words and symbols "speak" to us. Words flow off the tip of a pin or the tapping of keys with no conscious effort. Writing reveals something about us. There is something special about the great books and the insight they give us into the great minds who penned them. It is said that books are autobiographies. Many of these writers struggled to develop not only their thought but also their literary style, many were polished essayists. Liberal education is not only about reading classics but penetrating the minds of the authors, reading, thinking, probing, and thereby developing vital critical intelligence. Books are a highly effective media for this type of reflective thinking. Such collections of books also give those who study them a common language. Youth of today, thumbing keypads, frequently are unable to write well, many no longer know cursive. It is all too easy to just cut and paste without giving meaning much thought.

The book itself is an extremely important development. It is a method of collecting information in an incredibly ergonomic format. Many people simply love the feel of books, of turning the pages, of scanning the print and illustrations. There is something magical about this. Can the e-book replace this quality? It took a long time for the e-book to gain traction and currently the print industry is not only holding its own, but again gaining ground. Libraries themselves often have the ambiance of cathedrals.

The idea of libraries brings me to a collateral thought. Digital technology gives us access to truly vast stores of information. But how much can we read in a lifetime? For that matter, what is the minimum a community needs to have access to in order to conduct its affairs. Much of what was known about the world at the beginning of the industrial revolution could be contained in a thousand books. Power printing and paper mills accelerated the production of books. This required a means of classification. There are ten major categories in the Dewey Decimal system, plus fiction and biography. This system is numbered from 001 to 999, a thousand categories. To which is added three letters of authors names. There are now three or more decimal points added. That is an exacting classification. It is a classification of topics; each book likely includes a lot of diverse ideas.

[110] At its worse, NLP is used to manipulate.

The Library of Congress system uses the alphabet, three letters, 26x26x26, plus decimals and author designation and dates. The library of the major university where I live has two million bound volumes. The U. S. Library of Congress has 51 million cataloged books plus hundreds of millions of other items. You can find Emerson, you can find Emerson and his journals, you can find biographers who tried to understand Emerson's "Man Thinking." His lectures, essays, sermons and notebooks are all available. There are hundreds of books in the Emerson section in the local university library. You can make a lot of notes, but do you get the essence of a great mind struggling to resolve the problem of a then emerging industrial order. I believe Bush attempted to come to terms with both accessing and organizing information, a reflection of another great mind struggling with the realities of life.

Korzybski proposed a new, non-Aristotelian, library. How many books would it contain? He essentially proposed a new series of books – starting from scratch? Borsodi did the same with his University of Melbourne (Florida) experiment. The initial library had 4,500 books organized according to seventeen major problems of living. Some were listed in multiple problem classifications. Perhaps a more important question is how many books can we read during the course of our educational development? And I scope that to a lifetime of learning. One of the best-read groups in the country are, curiously, corporate CEOs. They tend to read about 50 books per year – all meeting needs for their continued competence. The average college student reads a fraction of that, about half for pleasure. Granted, there are a number of topics for which a local library should have reference material, but Korzybski wanted to develop a generalist. In short, the key question is how many books it would take to produce the generalist Korzybski advocated, an individual well rounded in science (his bibliography for *Science and Sanity* listed 800 odd books, and the humanities (St. John's College has about 100 great books). A library of merely 10,000 books could cover a lot of ground. Specialized libraries, as Meise suggested, could provide access to more specialized material, today digitally. So do online book sellers. Internet Archive is working in that direction. Wiki provides a framework,

Is digital enough? We must consider the fact that there is an integral linkage between the eye, hand, and brain. The hand expresses something coming from the brain and coordinated by the eye. The hand is also a vital input sense. Korzybski noted this with his advice to handle the labels of the structural differential. We learn by manipulating objects and especially by using tools to shape the world to our imagination. Bucky Fuller said "make it visible." For him that was physical models.

There is a small field devoted to analog learning, pen and paper. A lesson can be taken from Nobel laureate, physicist Richard Feynman, the Feynman Method. He developed an exacting procedure for getting his thoughts organized on paper. In response to a comment about his notes, Feynman made it clear that they were not notes about his thinking but were rather his actual thinking. The human brain does in fact function best in this manner.

Feynman solved the problem of the space shuttle disaster but putting a bit of material used in the booster rocket, an o ring, into a glass of ice water. The disaster happened on a cold day. The material used in the booster rockets, he demonstrated, became brittle when chilled. It didn't take many words.

Knowledge is derived from fragments. Thinking is like working a jigsaw puzzle, connecting the dots, creating an outline. Cut and paste is not only a convenient trick, but also a powerful tool. Note cards are also a powerful system. The zettelkasten, a manual note card filing system, was developed by German legal sociologist and general system proponent Nicholas Luhmann. It enabled him to write an average of two books and over a dozen scholarly articles per year over the course of his career. This approach accelerates comprehension of complex systems. It fuels the underlying intuitive capacities of the human mind. There are digital equivalents but there are also many, by no means computer illiterate, who find the manual system superior. It engages them across a broad cognitive spectrum.

Our need today for a generalist is even greater than in Korzybski's time. Systems thinking has unfortunately gained little ground. There is growing academic acceptance of a multiple disciplinary approach, but by no means widely popular. You may find a course of general systems but not a major (systems ecology a possible exception). We need people who can embrace a strategic, holistic, and complex environment. We know that in action, what we can do at the movement comes from what we understand. Shlain, a surgeon, said it well: You would rather hear your doctor say "Ops" than "Hmm? Professionals, doctors, lawyers, pilots and master crafts people are the product of long training where understanding is gained and muscle memory established. They must think on their feet. How long and how much study does that take to develop Korzybski's generalist. He stated, as noted, and explicitly, that the time required could be dramatically shortened with general semantics.

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