A Theory of General Semiotics

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The Science of Signs, Sign-Systems, and Semiotic Reality

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This book is dedicated to the memory of Prof. Anatoly Karmin, whose friendship and support encouraged me to develop and publicize my theory of general semiotics.

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FOREWORD

I had my first glimpse of semiotics in the summer of 1983. At the time, I was preparing for a sabbatical year and, as part of my preparations, I applied to the *International Summer Institute for Structural and Semiotic Studies*, a program of Indiana University-Bloomington. I had read some of the papers that had been published by the institute, and felt that they dealt with something very similar to what I was interested in investigating. As an educationalist, I had taught foreign languages to children (in Russia) and adults (in Israel). What concerned me were some issues related to the methodology of teaching foreign languages. In particular, I had observed that when we taught foreign languages to children, we always began with a visual exposition of the words we were presenting, but when we taught adults, that type of introduction frequently did not work well. I wondered why this was the case. I had hoped to be able to spend some of my sabbatical at the Indiana University institute, researching this and other topics pertaining to the teaching of foreign languages to children and adults. Although the institute was unable to invite me to the center to undertake my project, they did invite me to take part in a seminar on semiotics that they were sponsoring that summer in Portugal, and I happily agreed to attend.

It was the invitation to this seminar that first introduced me to the notion of semiotics in scientific discourse, and the seminar itself was something of a turning point in my professional life. The beautiful environment and the general atmosphere were so appealing, and the intellectual potential of both the participants and the lecturers was so great, that it was

a pleasure to be involved in the activities there. The organizers invited some of the most prominent professionals in a variety of fields to lecture on the role of signs in their fields.

What attracted my attention most at the seminar was the fact that each field defined and made use of its own semiotic concepts, and these concepts were never assembled together into any sort of comprehensive whole that could serve as a common framework for them all. There was a very interesting lecture on ethnography and the signs that were identified in its oldest artifacts; but the topic was presented in ethnographic terms and obviously belonged to that science. I asked the lecturer if she presented the topic at meetings of ethnographers using the same terminology and concepts, and she affirmed that she did. When I asked her what was specifically *semiotic* in the whole process, she could not give me a clear answer; she merely thought that it was inherently obvious. The same thing happened when a prominent lecturer from Germany gave a presentation on educational issues concerning how young children learn to draw. Finally, there was a lecture on bull-fighting, in which the lecturer spoke of the standard procedures involved in that realm and the traditional, established way in which they were performed. He treated these standardized behaviors as signs.

In each of these cases, I was introduced to signs as they existed in particular surroundings, but what they had in common – what could properly be called *semiotic* about them – remained concealed. The semiotic sense of the matter evaded me completely. Each topic clearly belonged to the field in which it came into existence, and remained strongly entrenched in that realm. This problem has remained with me ever since my first introduction to semiotics at that seminar, and it has colored my semiotic approach throughout. Later on, I attempted to create this common ground myself. I named the

framework I developed *general semiotics*, because I wanted to highlight the distinction between it and what I called *branch semiotics* – namely, the independent systems of semiotics that exist within any *branch* of science other than semiotics proper.

My efforts led me to create an entirely new science, one that was constructed outside of all the other established branches of science and had its own distinct paradigm. The process of formulating the foundations of this science of general semiotics took me about twenty years. During that time, I wrote and published more than ten monographic works on the topic (including some that were only published on the internet), as well as innumerable articles, and I spoke at a large number of forums. Needless to say, various aspects of general semiotics are at the heart of all of my works.

After those twenty years of intense activity, I think the time has come to summarize my work on general semiotics, systematically constructing and presenting it so that all those who are interested can learn about it and judge it on its own merits. To this end, I have composed this book.

For general semiotics to successfully achieve the goals I set for myself when I set out to develop it, I believe it must satisfy three requirements:

1. It must be built upon the achievements of branch semiotics
2. It must have a specific and more or less complete structure
3. It must provide all concrete branch semiotics with a solid foundation and a set of practical instructions that can be applied to them.

Whether these requirements are met in this book is something you must judge for yourselves after you have read it.

PART I.

GENERAL INTRODUCTION

CHAPTER ONE

THE ROLE OF SIGNS IN OUR WORLD

As humans, we are all immersed in a profusion of *signs*. This is not something we actually feel – just as we are not aware of the air we breathe, we are not cognizant of the signs that surround us – but without signs we could hardly take a single step, much less perform a purposeful chain of actions. When we wake up, before we even get out of bed, we usually check the time on a clock. A clock is a device that employs signs to show us the time; and time-measurement itself is a system of signs created by people to help them organize their time. After we check the time, the next thing we are likely to do is gather information about the weather. We may collect this information from the radio; or we may look at a thermometer hanging outside our window. Which way we choose to gather the information is not important at the moment. What is important is that we find and comprehend signs that tell us about the weather (the words of the weather report, or the numbers on the thermometer), and we make decisions based on these signs: we dress in appropriate clothing, bring an umbrella along with us, or take other precautions in order to be prepared for the vicissitudes of the climate.

Soon after this, we may leave our home and walk towards our car. As we walk, we perceive various signs that tell us about the car's current state. For example, we see that its lights are off, so we understand that the engine is not running. Subsequently, we perform other actions in order to prepare the car for a trip. These actions also involve signs: the sound of the engine igniting as we turn the key in the ignition tells us

the engine is now on; a light on the dashboard tells us the headlights are on; a label on a button indicates that pressing the button will turn the rear defogger on.

As we continue through the day, we encounter and assimilate more and more signs. In fact, all of our actions are imbued with our analyses of the signs we discern, and these signs pave the way for us to respond appropriately at every juncture.

Not only do our everyday pursuits completely depend on signs, our mental activities nearly always rely on them as well. To be sure, not everything we do is governed by signs. There is also an emotional sphere, which is primarily built upon feelings; and there are instinctive responses, which are either inborn or internalized after intensive training. Yet even these realms are supported by a substrate of mental control that is founded on the use of signs. Whenever our automatic responses are put on hold, we turn to our mental constructs, which are built on logic (a system of signs) and external signs, for guidance. Lastly, there are hugely important domains that are exclusively composed of signs: we speak with words, write with letters, orient ourselves in space with maps and charts, play music and sing by reading notes, and so on. All of these are signs. In fact, the list of human activities that rely almost entirely on signs is virtually endless.

All of this gives us the right to call human beings "symbolic creatures," because we make such extensive use of signs – employing existing objects as signs, and also creating new items to specifically serve as signs. The notion of a "symbolic creature" was coined by the German philosopher Ernst Cassirer (1874-1945) at the beginning of the last century. With this idea, he differentiated humans from all other living creatures. In my view, Cassirer was right on the mark when he made this point. We really do differ from all other living things, as well

as from inanimate objects; and, first and foremost, we differ from them in the ways we use and produce signs.

The evolution of sign usage

Although people today are certainly "symbolic creatures," this was not always the case. At earlier stages in the evolution and development of human beings, people did not use signs as we do today. We can divide the history of evolution on our planet into five stages, based on the relationships between signs and the most evolutionarily advanced entities extant at each stage. By tracing the path of evolution from stage to stage, we can build a sort of *ladder of development* of sign usage.

Stage 1: Inanimate matter

The first evolutionary stage precedes the emergence of living organisms, when only inanimate objects existed. Inanimate objects can interact with other objects (both living and non-living). They can be influenced by them and exert their counterinfluence upon them. As a result of these interactions, they may be changed, mutilated, and even destroyed. But inanimate objects cannot envisage signs, because they cannot envisage anything – they are not alive. Nor can they *respond* to signs in any direct way. In spite of this, sign-less, inert matter managed, under certain specific conditions, to give birth to the first primitive living organisms. How could this have happened?

People have proposed two kinds of answers to this question. The first is very simple, and seemingly "obvious." It says that there is some external source, independent of us, that is omnipotent and that created our world. People call this force *God*. This constitutes the religious approach to the problem.

In humanity's early days, this solution was considered self-evident, and was accepted by all of the people on earth.

The second approach to answering this question is much more complicated, and it appeared later in human history than the first one. Those who adopted this approach looked for forces of nature that, as a result of their own internal development, changed themselves into what we see today. This approach is based on science and on a high valuation of human ingenuity – namely, on the premise that people can acquire knowledge by surveying the things around them, understanding their essence, and changing them to their advantage. I personally accept this second point of view. I am presenting it here in part because this approach is founded on signs.

According to this latter approach, there must be conditions under which living matter can emerge from lifeless objects. I believe that the first and foremost condition is that the inanimate objects must be amassed into a "system." This state of being is opposed to a "heap" – a random collection of things. You cannot accommodate yourself to a heap, because it is not in any predictable order. A system, by contrast, is predictable; in it, one can identify causes and effects, and living organisms can adjust themselves to these factors. Our solar system is an example of a combination of causes and effects of this sort: it is clearly structured, its parts behave in a consistent manner, and it has a constant source of energy from the sun. When single-celled creatures appeared in this system, they could find ways to adapt themselves to the existing conditions. This is how life began.

Stage 2: The vegetable kingdom

To be deemed a living organism, an entity must have certain basic properties – features that distinguish it from inanimate matter. It must have a cellular structure, and that structure must include a reproductive mechanism. It must also

have a device of some sort that captures external signals and responds to them.

In the inanimate world, the basic composite particle is an *atom*; in the organic world, it is a *cell*. Every living organism must consist of at least one cell.

The earliest, simplest living creature most likely belonged to the vegetable kingdom, because members of the animal kingdom require oxygen in order to live, and vegetation is the primary source of oxygen. Furthermore, of all living organisms, vegetables are the simplest in terms of how they deal with signs. Thus, the next stage in our *ladder of development*, after inanimate matter, consists of plants and vegetation in general.

Vegetables respond to signs, but only to a very small number of them, and only in a very primitive way. A plant can only survive in a specific type of environment. Every individual plant chooses its own environment, and adapts itself to that environment. Some of these adaptive mechanisms are then transmitted to the following generations. The scarcity of signs that are detectable by plants is the result of plants' immobility. They are fixed in the same place throughout their lifespans, so they do not actively seek signals from outside of themselves. Only signs that reach them by chance manage to attract their attention. These stimuli are more *signals* than real signs, and plants' responses to them are essentially automatic reactions that are inherited by the plants from their ancestors.

Inasmuch as plants are alive, they must have some mechanism through which they reproduce. Some of them reproduce through their roots – that is, by simple cell division. But others use more advanced methods, regenerating by means of seeds that are disseminated by the wind or by insects. In these latter cases, we can identify male and female gametes that merge together to impregnate a zygote. On the *ladder of de-*

velopment, these plants are slightly above the others, closer to the next class of living organisms.

Stage 3: Animals

This class of animals includes microorganisms, insects, reptiles, fish, birds, mammals, and other non-human creatures – any organism that can move from place to place in order to seek out food, drink, copulation, and living facilities. Naturally, these organisms are much better at adapting to their environments than vegetables are, because they can search for new and potentially useful signs as they move from place to place; and they often find them. When they find such signs, they learn to look for them again in the future, so that they can better accommodate themselves to new and otherwise unpredictable conditions. Their success in gaining new benefits from nature is what drives their progress, both physically and mentally.

Nonetheless, in this respect the abilities of even the most advanced animals cannot compare with those of humans. Animals are already *specialized*, and they cannot escape the boundaries of their innate specializations. You can think of the process of specialization as the building of a stone staircase. In this staircase, the stone that serves as the third step cannot also be used as the fourth step; the only way you could use it as the fourth step is by destroying the previous step or the whole structure, and then rebuilding it. If a stem cell has evolved into a nose, it cannot become eyes or fingers. Improvements can only take place within the boundaries of a specific species and during a specific period of the organism's development.

This is why apes, dolphins, and even parrots cannot learn human language – they are limited not only by the scope of their minds, but also by the whole constitution of their bodies. This last factor places limits on the minds themselves and

prevents them from undergoing far-reaching alterations. Yet, within these limitations, animals, especially highly developed ones, are exceedingly capable of perceiving different signs and responding to them appropriately. Some animals are even better equipped in this respect than men. Dogs have better smelling capabilities than humans; which is why we use dogs to help us find concealed things by smell. Yet animals are very limited in their abilities to invent new signs, and they are unable to conceive the real nature of signs as representatives of something different from themselves. We humans are the only ones in the world to understand the real nature of signs and to create new signs of various degrees of abstraction and complexity. For animals, signs essentially remain more like signals than like the signs humans employ; they learn to react appropriately to some of these signals, but they do not advance in their use of signs beyond this level.

Stage 4: Signs truly belong to humans

Unlike animals, we humans are real inventors of signs, and we are also their devoted adherents. We create signs of varying levels of abstraction, and the more abstract they are, the more force they seem to hold within them. The most abstract of our signs are powerful structures, mighty in their profundity and in the strength that comes from generalization. Our abstract signs are so potent that we can reach important conclusions about the world around us just by manipulating the signs, without referring to the material objects they represent at all during the entire process; all we require to validate the conclusions is to obtain empirical confirmation later on.

We also use signs for the creation of what we call *culture*. Initially, we did this using oral signs. Then we invented writing and used it to transmit our cultural achievements to later generations. Furthermore, not a single scientific research project can be completed without using signs to clarify our inten-

tions, define our plans, and denote our progress. There is no such thing as a new idea that can be expressed without signs. Signs are necessary both to clarify our own thoughts and to transmit them to other people. Not only do we create separate signs, we also unceasingly construct newer and mightier sign-systems, which help us in all of our endeavors. Of the many thousands of systems that humans have constructed based on signs, we need only mention systems of writing, drawing, technical drawing, musical notations, and mathematical symbols, to illustrate the importance of signs for human progress.

Finally, and most importantly, we ourselves progress as we invent and use new signs and sign-systems. Over the generations, our signs and sign-systems have become more and more abstract and all-encompassing, and with them, our minds have become more sophisticated, skilled, and able to cope with more complicated tasks. It is indisputably clear that humanity has become cleverer as we have acquired the ability to develop more abstract and ingenious ideas.

Stage 5: Signs for machines

As humanity created and employed ever more abstract signs, we came to the realization that we can relegate some of our less important tasks to inanimate devices – to machines that we endow with certain human qualities. These machines can accomplish some purely human tasks no less effectively than we can ourselves, thus sparing us both time and effort. For this purpose, we create devices that respond to certain problems exactly as we ourselves would. That is, we *endow these devices with signs*. This is the final step in our *ladder of development*.

Consider, for example, the lengthy history of human digging methods. At first, people dug into the ground with their hands. Then they began to use objects they found near their digging sites, like rocks or branches, to help them. After this,

they invented shovels of various types, and, much more recently, dredges and bulldozers. When we make use of the latter devices, we do not manually exert our physical force on them (as we do with shovels); rather, we send signals to the machines, and these signals serve as signs that cause the machines to respond in the appropriate manner.

At each new stage in the development of digging tools, people implemented ever more effective means for digging, making the process quicker and less physically demanding. The same is true of the history of weaponry. Over time, weapons have become more and more sophisticated. Today, many are capable of pinpointing multiple signs, analyzing their interrelationships, and responding exactly as we would wish them to. These devices behave as if they were thinking entities, in spite of the fact that they are not actually thinking in the human sense.

Nonetheless, certain types of human thinking are beyond the abilities of machines. Deep and authentic human thinking is necessary for dealing with options and alternatives. Our lives are so multifarious and diversified that it is rare for us to encounter situations for which only one decision is unequivocally reasonable. Because of this, we are accustomed to choosing one of many possible options for handling our problems. This is impossible when we implant signs in machines. They cannot make choices in the same manner as humans, considering pros and cons; they can only react to stimuli with a single response. Any potential for hesitation on the part of a machine must be removed by designing it in such a way that it implements one and only one specific response to any specific input.

There is another striking difference between human thinking and the possible reactions of a machine to signs we introduce to it. Our thinking is synergistic – it is able to simultaneously grasp several dimensions and levels of a question. Ma-

chine "thinking" is exclusively linear – one step follows another sequentially. When we express our thoughts, either orally or in writing, we also present them linearly. This is because we are using signs (words or letters) to express them, and signs can only follow one another in strictly linear sequences, even when they are used to formulate multilevel mathematical formulas or rebuses. That is, on the horizontal plane of a sequence of signs, the progression is always linear.

In human thinking there is also a vertical plane. When we think, we are able to grasp not only the linear structure implied by the order the signs, but also the meta-rules underlying this construction – the reasons we picked this particular design and not another one. Imagine a group of people walking in a park. They can automatically follow a well-trodden path to find the way out of the park, but they can also think of another route and use it, if they decide that it is a quicker and easier route. In the first case, they are handling the task of leaving the park linearly, but in the second, they are approaching it vertically. Machines, by contrast, never propose new meta-decisions like this; they always patiently follow the paths implanted in them by their designers.

Whether "clever" machines will ever be created that will be able to understand the quantity and quality of signals understood by humans, and, if so, whether we will be able to bring them up to our level of thinking, is not clear. At present, what is clear is that the abyss between people and machines is huge and will not be bridged in the near and foreseeable future.

Conclusions

From what I have said thus far, one can draw a number of preliminary conclusions. The main conclusion is that signs are very important for human beings, and, therefore, we should undertake additional research about them and endeavor to

know more about them than we know today. I am sorry to say that we currently know very little about them. To prove this thesis, you need only ask yourself if you have ever read anything about semiotics – the science of signs and sign-systems. I am sure that most of my readers have never heard anything about the topic and its ramifications. The situation was not always so gloomy; in ancient Greece, many philosophers were interested in the problem and wrote a great deal about it. Later on, and especially in modern times, people are simply unaware that semiotics exists and that it is worthy of scientific attention. Philosophers are busy delving into issues related to scientific research, but they only pay attention to two elements of the process – to the researchers and to the objects of their investigation – and look exclusively at the relationships between them. Signs as active participants in the process are neglected completely. This situation should be changed.

A second conclusion concerns the *way* the situation should be changed. What is needed is to create a new field of study, *general semiotics*. Unlike the phenomena I call *branch semiotics*, which exist within particular sciences and professions and deal only with the semiotics of the fields to which they belong, general semiotics would be devoted to formulating laws and principles that are common to all semiotic systems. This is a subject I have dealt with a great deal throughout this book.

A third conclusion is that each of the hundreds of existing systems of branch semiotics belongs to one of the four groups discussed above: *semiotics of plants*, *semiotics of animals*, *semiotics of humans*, and *signs for machines*. In my opinion, each of these groups should be studied separately, and scientists with different qualifications should deal with each of them. In this work, I will dwell mostly on the *semiotics of humans*. It may be that some of my ideas will also be relevant to some of the other groups, but, in general, it will not be easy

to apply them to semiotic domains other than the semiotics of human beings.

CHAPTER TWO

WHY WE NEED GENERAL SEMIOTICS

Whence the division between general and branch semiotics?

Historically, branch semiotics came into existence long before any general principles concerning signs and their systems were developed. The reason for this is obvious: concrete scientific disciplines could not take shape without the special signs they required. They could not wait for the birth of a general science that would provide them with theoretical principles for creating and using signs and sign-systems. Because of this, we only encounter formulations of the general principles of signs and sign-systems long after the first branches of science came into existence. Furthermore, because each of the systems of branch semiotics developed its foundations independently, no common principles took shape that could be applied to all of the systems. Since the various forms of branch semiotics seemed to be equal to the tasks for which they were created – chemical semiotics satisfied the needs of the developing field of chemistry, architectural semiotics met the evolving needs of architecture, etc. – no demand for a general system of semiotics ever arose in the scientific community.

We can formulate this thesis better by saying that the development of each science was dependent on the signs that science produced for itself. No science could advance unless its signs developed along with it. Over time, scientists have

invested as much time and energy on introducing properly honed signs as they have on the creation of research methods and tools. Consider, for example, how much time and effort were expended on coining the standard system of chemical symbolism – on the symbols for elements, the formulas of molecules, their combinations in various reactions, etc.

If this is the case, you may well ask what point there is in developing a general theory of semiotics. If the internal development of semiotic symbolism meets the needs of all the sciences, why bother trying to change things? Why not leave everything as it is? It is this question that we shall try to answer in this chapter.

Since we cannot hope to analyze the development of signs in every sphere in which they are currently in use,[1] we will focus on a few telling examples. One of the first sciences in which professionals applied signs was medicine. Although we know that signs were used as part of healing long before the Greco-Roman era, the earliest written sources we have that document the systematic utilization of signs for medical purposes are from ancient Greece and Rome. The collection of medical texts called the *Hippocratic Corpus*, which was composed in ancient Greece, includes a work called *The Book of Prognostics*. With carefully chosen details, this book lays out instructions for physicians about how best to observe and examine patients. In ancient Rome, those methods were further refined by the anatomist Galen. He was even more insistent than the Greeks had been that heedful observation of symptoms and signs was necessary for the accurate diagnosis of afflictions and disorders. This constituted an obvious digression from the usual practice among ancient peoples, who attempted healing mostly by calling upon gods and soliciting

[1] Note that it is not only sciences that require the use of specific signs; every profession and practical occupation – carpentry, shoemaking, etc. – also has its own set of signs.

aid from malevolent forces, in the belief that it was these agents that brought about maladies.

Although archaic healing practices continued among primitive populations for thousands of years after Hippocrates and Galen introduced the scientific approach to diagnosing and treating medical problems, little by little, the scientific perspective prevailed. Today, most doctors hardly seem to raise their heads from their computer screens, culling their conclusions far more from the signs they see there than from personal observation of patients. Over time, the use of signs in medicine has steadily increased, and the methods employed to extract them have become more and more sophisticated, to the point where doctors themselves are unable to understand the curves and diagrams used to represent them and have to apply to specialists in cases requiring special treatment. The time will soon come when machines that work with signs will be able to diagnose conditions and prescribe their treatments more quickly and correctly than humans. In this way, we are gradually transferring our wisdom to electronic mechanisms.

Consider another example, one that is more closely associated with my professional training and experience: linguistics. It is well known that the so-called *natural languages* developed spontaneously within each individual tribe and nation. They grew out of people's need for communication and cooperation, and were created by trial and error. Only much later did the process I call "combing existing languages" occur. It is from this latter process that the science of linguistics came into existence. A special attitude towards words also emerged at this time: words came to be viewed as signs whose properties extended beyond their simple meanings. Linguists began analyzing words and their combinations, and from their conclusions, they created the first grammars. Special manuals were written for those wishing to learn established languages and dialects. In fact, dictionaries from circa 1000 BC have