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CHAPTER 6
The Beginning of
a Scientific Art of Mind-Using

To you, your mind is the most momentous fact in the universe, the greatest thing which infinite space contains and must ever remain to you the most wonderful.

Your mind is to you the Gateway, and Original Thinking the Golden Key to the universe, for what never enters your consciousness can never be for you.

—ELMER GATES , early writings

Elmer Gates took a new excursion into studies of how his mind became most originaive and accurate. This led to important new steps. He collated from all accessible sources alleged data relating to the mind, and believed that by passing these data understandingly through his mind certain portions of his brain would grow functionally stronger and enable him to detect incongruities and generalizations that had escaped notice. This practice he followed with great conviction and intensity, eagerly seeking data and feeling uneasy because they were not accurate. He became impressed with the need for greater accuracy in what determines the actual data of a science. "I have read about and witnessed the irrepressible passions and ambition of intense

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personalities," he said, "but I doubt if anyone else felt greater eagerness and earnestness and exaltation than I did during this period."

He was much baffled by first attempts at a classification of scientific data from simple to complex, from concrete to abstract. No criterion existed. Another and greater difficulty was that the literature of philosophy, psychology, and other sciences was so vast he could never hope to read it. His Uncle Jesse had spoken truly indeed. And of what he read there was no way to distinguish the false from the true. He did the best he could, collected and classified data that seemed most reliable and typical, but subsequent experience proved that he did not then have any guide for best mentative results. But he passed *understandingly* through his mind such data as he had, practicing the Mind Art principles. The result was a *greatly increased mental capacity*, and the achievement of more original work than previously attained.

In this early and somewhat empirical stage Gates tried many things that proved failures, but slowly he felt more confidence in

the method. Empirical ways gave place to scientifically determined processes, and he felt he was discovering an art that would enable him to accomplish vastly more than without it. Through the application of this art to himself he discovered how his mind made its successful efforts at discovery. This art, he saw, contained the elements of *its own constant improvement*, and by its aid he did all further investigating, and did better work and much more work.

Re-functioning, as he called his method of processing mentative data, was fundamentally different from learning by heart, or reading or studying. As defined later, it is the special re-conscousing and recognizing of states in a process, a voluntary recollection of a memory-enregistration to notice all the conscious elements at their fullest vividness and to repeat fully the physiologic activities belonging to them. This re-functioning of an enregistered memory-structure revives and brings again into consciousness the same, or nearly the same, state of activity that originally produced the structure; and this re-functioning is

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remembrance, reminiscence, and recollection. Every consciously discriminated state causes certain nervous structures to functionate and thereby to undergo a structural (metabolic) change that remains as a more or less permanent anatomical addition. Such an enregistration is a memory-structure, and its re-functioning is remembering.

While re-functioning data, he made an effort to introspect and record very minutely and accurately all he could notice relating to the states and processes of states while engaged at a mental task that, during and after quiescence, he did over and over daily for weeks, so that no aspect would be missed. He noticed that he was getting excited about something that was nearly ready to happen, he knew not what. He had noticed this phenomenon before, a foreglow of a new idea that was on the way. "It is truly wonderful that the mind can know that it will soon know something new," he exclaimed. "If I had not experienced it a number of times I would not believe it. There is one kind of epilepsy wherein the patient feels the 'fit' coming on, sometimes sees it as a sort of entoptic light called the 'aura epileptics.' In somewhat the same manner the discovery of a new idea is sometimes preceded by an 'aura idealis': the morning twilight before the sun of the new insight has risen." For several days he was aware that he was taking a step, and at last, greatly to his joy, he found that he had so frequently re-functioned the states and processes of the mental task that some of them went on of their own accord as a habit, or automatically, and were then *not modified by the introspective process!* It was by a

kind of introspective attention in which the Awareness was a more dominant factor than previously, but not yet dominant. He called it the Newer Introspection.

Gates pointed out that he was aware of James' "field of consciousness" and of the "marginal states" (which he learned about later); and he agreed with the modern criticism of the "faculty psychology" and of the existence of "states" in the sense of the old psychology. But in any field with its margins in definite and purposive intellectual processes he found a series of successive and

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discriminable states constituting a process of states; the margins disappear from notice after sufficient re-functioning until the process goes on automatically.

To study and test his great psychological discovery more fully, he repeated his experiments, taking this time a definite group of intellectual states and processes, namely, acoustics. He acquired by observation and experiment its scientific data, then passed groups of this data through his mind until the process became habitual and almost automatic. The states were not, like the alphabet, arbitrarily related; they were "processives" of states, as he called them—that is, states tied together by rational relations or a purpose. He studied this subject a long time and became very familiar with the science of acoustics. By an extensive process he made a re-study with his own mind, and with other minds that had previously known nothing of acoustics, to determine the way and order in which the mind naturally arrives at knowledge of a science. He introspected every one of his steps and thus became again interested in mental content and groupings of states, or their classification.

What constitutes the total memory-content of an average human mind? What is a mind? What kinds of mental content has it? What percentage of its memories is useful or true? How does the content of one mind differ from that of another? What bearing have variations in content? These were questions about which he did not want guesses—he wanted knowledge.

"If you say of an object, 'That is a microscope', it will be true only if it contains all the essential parts, not for instance if the lenses were missing. Now, what is it that must be present? What details must not be missing? so that it may be true when you say, 'That is a mind'? How are we to find out except by making a complete inventory of a mind? But a mind begins its development at infancy or rather at a pre-infantile stage and grows through various stages to maturity and old age, thus passing through a series of developments, all of which steps, with their concomitant

states, processes, functionings and products, must be referred to if you say, 'That is a mind'. Not only one,

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but many such inventories of the whole life of minds need to be made, tabulated, and studied if you wish to know what is a mind." So he further queried.

He felt the foreglow of a new step, and under this impulse and leading made a comprehensive inventory of every experience he could remember or introspectively notice, systematically recorded under its proper heading of sensory, intellective, introspective, esthetic, or conative. The good or bad of his life, every reprehensible or laudable act, was impartially studied. No other experience of his early life contributed more than the one simple trait, learned perhaps mostly from his tutor Virginia, of looking at his mind and work with the impartiality of a third person and thus eliminating much personal bias.

In several thousand pages, conveniently classified, he recorded all he could remember of his experiences with or about stars, plants, animals, minerals, chemicals, mechanics, literature, language, mathematics, logic, history, fine arts, religion, and everything else. His total vocabulary was included, as well as all experiences with emotions, such as those relating to parents, friends, schooldays, social events, angers, griefs, joys, laughter, amusements, and all things he had made and done. He was amazed not only at the magnitude of his inventory but equally at the vastness of what he did not know about each subject.

It was a long and tedious task. Many times when certain portions were considered complete he would recall additional incidents. Maybe it was a book read long ago, or a slight illness or visit or conversation or a walk or a dream-and it was a task to record all that could be slowly and indistinctly remembered. Maybe it was an early acquaintance who was hunted up and interrogated for assistance in recalling a that had taken place between them; or perhaps the only clue was some scrap of paper or part of an old letter. Sometimes by repeating a walk or trip, things and places could be recalled . . . or rereading books or repeating experiments. He found it peculiarly difficult to recall with sufficient definiteness to state them, the emotive pleasures, pains, and sorrows of earlier life.

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Although Gates had almost entirely escaped the "swarms of pestiferous superstitions and the usual brood of ghost and fairy stories, Arabian Nights' tales, Munchausen fictions, Gulliverian legends and mythologies," and although his training had been

unusually inductive, nevertheless he was startled to find most of his mental content obviously useless, irrelevant, theoretical, false—"utter trash" as he called it: "the unproved, the plainly untrue, the unimportant, dream-memories, and the thousand-and-one things that fill the mind like rubbish in an attic or a pile of driftwood after a flood. For example, when calling on Aunt Martha yesterday I noticed one corner of her rug was rolled over, her pet lamb walked in, two sparrows were fighting in the lilac bush, my chemistry book has an ink spot on its back, I saw two men walking up the street last winter when there was snow on the ground, and so on ad infinitum." Of this mental content, at the very least he estimated 90 percent as waste! For every one of the many unimportant details there were hundreds of duplicate memories beyond the need of any lesson that might be derived from them. He was certain he did not overestimate (and later raised the figure to 95 percent).

To the extent that he was able to persuade others of his age to make such an inventory he found at least an equally large percentage of trash. He was reminded of the long course of human progress "during which thousands of successive mythologies and philosophical vagaries and superstitions formed the chief portion of the memory content of human minds, and it was by the functioning of that mostly false content that our brain organs evolved and our mental habits developed!"

If this 90 percent worthless memory content, he observed, could be exchanged for actual and useful knowledge of the sciences and arts, a young person would have room in his mind and time sufficient to learn twenty times as many facts, formulas, and laws. He could get an ordinary education in one-fourth the time, and that would mean much to the world's inhabitants. If every day a child were to acquire one-fifth as many worthwhile memories as he habitually gets useless ones, if he were to

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acquire them in *classific* groups of naturally related data by being shown the corresponding objects and their interactions and interrelations, so as to know not on mere authority but upon the direct evidence of his firsthand experience, how much time do you think would be saved in getting an education, and how much better it would be!

But even more important would be the elimination from the mind of the misleading influence of the untrue, and the encumbering and clogging presence of the useless mental content. The valuable content is now too much diluted, the intellectual brew is too weak and insipid to be stimulating.

This new knowledge about the mind, this vital importance of mental content, was a very useful discovery, a new method of psychologic research. It is not likely that many students will have time or energy to repeat this investigation (it took five years), but no practice would do more to give a knowledge of their own minds and a respect for true and classified facts for successful mentation. Even a small inventory, systematically sampled, should be illuminating.

After its completion Gates at once selected from his inventory those specific facts, intellections, esthesias (his term for the emotions, sentiments, and feelings generally), and acts (conations) that he knew to be true, then introspected and re-functioned them weekly (it took that long) By thus re-functioning them and neglecting the other kind, the valid part of his mind *rose into dominancy*, while the untrue and unclassified and catabolic parts subsided functionally so as not to contribute as much to mentative conclusions, insights, impulses, and readings.

He became convinced that no matter how certain he was of any statement, how much he wanted to believe, it was not safe even to consider it unless he knew it to be true. Only the alethic (the true, or veridical) inductive experiences can lead to accurate knowledge by any mental process. Only out of accurate images can accurate concepts arise; only from true concepts can true ideas be related. The use at any time of theory, hypothesis, speculation, or myth leads to a vitiation of the mental processes

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and a subversion of every conclusion. The whole outlook and inlook of the self will be distorted by a *single* belief not formulated on verified data.

With all the zeal of which he was capable (and that was very great indeed) he dedicated his future endeavors to ascertaining and collecting the veridical data of the sciences. He saw that if into human minds could be put this verified content from each science, conduct would then be guided more by truth and less by speculation and theories and beliefs. Only truth acted out in conduct could lead to good consequences; hence a prime factor in the mentative art became the re-functionation and introspection of the true, or alethic, part of the mind until it was dominant.

“Is there any more practical advice to the individual or the world? Any other way to solve the pressing problems?” he earnestly asked.

He was so impressed with the practical character of his discovery and the definite proof of its truth that he more carefully repeated his investigations. It became increasingly evident at each step in his researches that while mentative *method* was of first and

prime importance, the possession of mental states that were *validated* data was as important. False data led to wrong conclusions even with right methods, just as wrong methods gave wrong conclusions with right data. It became clear that the right mentative method in acquiring knowledge of a science could not lead to untrue data, and therefore a truly scientific method of education is of itself a method of *validation*.

This understanding of the nature of mental operations by the discovery of the true nature and scope of the intellectual processes enabled Gates to understand the numerous failures of thinkers and investigators, and to comprehend clearly that genius is not, as Nordeau and others supposed, connected with insanity, but is the normal functioning of the mind when there is a sufficient amount of true mental content to produce veridical results, and when normal and efficient methods of mental processes are used. On looking through the biographies of great

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men and carefully noting their successive steps in making discoveries, it became apparent that they were, as mentioned before, working in ignorance of almost every environmental, bodily, and psychologic condition of success. For every success, they experienced hundreds of failures; for every hour of efficient mentative functioning, they had spent many hundred hours of obstructed and diverted functioning through wrong mental habits. Seeing with clearness the nature of true, or alethic, data—and seeing that the only way to acquire them was by inductive experience with objects and phenomena and a psychologic classification of the resulting data—Gates embarked on a second pilgrimage, resolving to acquire a more definite acquaintance with his mental functions while engaged in making discoveries and inventions.

Once again he repeated his experimental introspection, bringing one class of conscious states into antecedent and simultaneous and subsequent activity with reference to each other class. He did this over and over until it was automatic. It was hard work and required long practice, he warned, because it was new to the human race. The savage does not identify a subjective mind but only objective things, without suspecting the intermediation of a mental process. Certain mental faculties like the musical or mathematical have long been known, yet not all people are musicians and fewer yet are mathematicians. Very few can really introspect. The average person who thinks himself interested will try introspection a few hours daily for a few months and abandon the effort and discredit it. To succeed one must have introspective ability and devote several years to it.

By the term “faculty” Gates meant no implication with the old “faculty psychology,” but a discriminably distinct kind of mental functioning, such as sensating, imaging, or introspecting. Appetite and respiration are physiologic faculties. A faculty is any distinct biotic activity, cognitive or physiologic, inclusive of all its states, processes, and acts.

He very carefully and systematically repeated the main phases of these experiments while under greater quiescence and re-functioned

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to automatism, and he was able to intensify the mental states that previously were comparatively faint. Having acquired greater maturity of mind and power of attention, he was able to formulate the psychologic nomenclature by which his results were recorded. New capacities were developed, particularly in the two kinds of introspection, that led to his discrimination of the difference between Consciousness and Awareness.

With these advantages he completed and corrected his inventory of rememberable mental content, and discovered many new facts and relations. The result was a description of the mind in terms of all its conscious states and processes and operations with these processes. While there are physiologic habits and other kinds of subconscious aptitudes from oft-repeated activities, constituting an important kind of organic experience, it is self-evident and immediately known, he stressed, that all experience that is *known to the mind* consists in conscious states (and their differentiations, integrations, sequences, and relations). All knowledge thus consists in conscious states; and to discover more about the nature of knowledge, he recorded every conscious step in the process by which his mind, through its inductive experience with the phenomena of a science while learning it, actually acquired the conscious states that are the data of that science. Thus he also discovered how these data could be psychologically classified, constituting what he termed a psychologic taxis, or psychotaxis, of the data of a science. For this purpose he again selected acoustics and taught it to several persons experimentally and to himself by supposing he knew nothing about it.

The psychotaxis of the sciences and of the intellections is one of the cornerstones of a scientific education; so his description will be followed in some detail. He proceeded by much experiment, observation, and introspection to make an inventory of the mind’s experiences with the phenomena of a science. He found that if he could not experience any sensations—if he could not touch objects or press upon them or feel whether they were warm or cold, or

exert muscular strength on them, or be tickled by them, or smell or taste or hear or see them—if he could not

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have any of the kinds of sensations (at least ten or more) produced by the objects acting as stimuli upon his sense organs, then he could not possibly know anything about their characteristics or even about their existence. Therefore, he concluded, the first chapter of any science, its simplest and most fundamental data, consists in *sensations*; that is, sensory experiences with the phenomena of that domain of nature.

An inventory of these sensory data involves no hypotheses or theories whatever. Even if according to Berkeley and certain Idealists we philosophically conceive of these phenomena as nonexistent, we do actually have these sensations and clusters of them. Out of all the sensory experiences derived from any object comes an integration of them called an “image.” In Gates’ sense it means not only a pictorial or visual image but combined with it an auditory image, a tangial (“touch”) image, and the images of all the other senses—the image being complete only when each sensory capacity has contributed all that it can derive from the object. This composite image is not a composite photograph, because only the visual factors can be photographed, but a unique kind of mental integrant comprising all sensory data as remembered states and their corresponding brain-enregistrations, in which each element has mutually modified all the others. To omit from this synthetic image any datum of any phase of one of these sensory capacities is to leave it incomplete and incorrect, with certain physical characteristics of that object unknown and unrepresented. Accordingly, when these images are classified, the mind creates wrong and incomplete groups, because it classifies not objects but only the sensorily derived images. The whole intellectual superstructure arising therefrom will be distorted and untrue and abnormal; the memory-enregistrations in the brain will be abnormal. Therefore the second chapter of data of any science consists in *images*.

In classifying images the human race has been guided largely by philosophical speculation and linguistic peculiarities; but according to the psychotaxic method, the mind, guided by its fundamental capacity to detect likenesses and differences between its

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conscious states, creates new and more truthful groupings of images into “concepts.” These are somewhat different from those named in the languages of the world, and more nearly true to the

nature of things. The third chapter of any science therefore consists in *concepts*.

The next step was discovering the interactive and other relations between conceptual groups of objects to form “ideas.” Thus, for in-stance, Gates’ concept of magnetism represented an actual group of magnetic bodies, and his concept of heat an actual group of hot bodies of which sensorily derived images were in his mind. When by experimentally conducted sensory or perceptual observation, he discovered that magnetic bodies have an effect on the temperature of hot bodies, he thereby attained an *idea* of that kind of relation between the concepts of magnetism and heat. The reciprocal relation was observed, to discover that hot bodies diminish the attraction of magnetic bodies to give the idea of that relation between the concepts of heat and magnetism. In a similar way he could try to discover relations between magnetism and each other concept of that science or other science, but it must be a *discovered* relation and not a fiction or it would not, in the mind-using sense, be an idea at all; and it must not be a successful guess, because it would not be scientifically known until inductively demonstrated. The fourth chapter of data of a science therefore consists in *ideas*.

If there are a thousand concepts in a science, then the whole business and opportunity of the investigator is to try to “relate” experimentally and observationally each concept of that science to each other one—the first on the list with each other one, the second with each remaining one, and so on, including the reciprocal relations, such as the second with the first. When accomplished, he has to the extent of his mental capacity systematically “ideated” every concept of that science. (In the instance above there would be 999,000 possible relations, or ideative efforts.) Hitherto this has been tried without such comprehensive system or rational method; and thus it happens that the human

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race has attempted only a comparatively small part of the ideative possibilities offered by the concepts of any science. It could not be done at all with the present arbitrary, theoretical, and nonpsychotaxic list of concepts. But with the psychotaxic concepts, systematic ideation becomes practical and startlingly fruitful, reducing experimental investigation to a scientifically comprehensive system and its mentative process to a scientific *art*.

Gates found by question and examination that even specialists in a science did not possess images of all its objects—generally not more than 20-30 percent, and most of them not only incomplete but largely incorrect! To get true images, concepts, and ideas of the kind used as a basis of original ideation and thinking requires

first the enregistration, by firsthand experience, of the subunits, otherwise the *normal* machinery of mentation will be absent. One fault of the present educational system is that it attempts to teach thoughts before ideas, or ideas before concepts—the intellections being in any chance order, or rather, disorder. The words image, concept, idea, and thought as used here have more definite and somewhat different meanings than those usually given in dictionaries and textbooks, in which they are defined largely in terms of each other, meaning everything and therefore nothing in particular.

Out of ideas the mind constructs a new and higher kind of mental unit termed a thought (or law of the first degree of generalization). It is a truth common to two or more ideas. There are also thoughts of the second and third degree of generalization. The fifth, sixth, and sometimes seventh chapters of data of a science consist in *thoughts*.

The next step in systematic intellection applies each other unit higher than concept to each other coordinate unit (as idea or thought). Other similar steps follow. An equally extensive series of data consists in introspects of all the foregoing kinds of conscious states—an “introtaxis.”

When the mentator has enregistered a memory-content of the data of a science, he has only completed the task by one third.

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He should proceed to enregister the corresponding introspects, and lastly combine the two into one taxis. Introspects are usable as a new kind of data by intellection.

This training is essential because the mind distinguishes between that part of its content which has properly originated from the study of objective phenomena and that part which is merely the mind’s introspects of that content. This is a distinction not made before. Introspects are coordinate in value with intellective data; and without making these two kinds of enregistrations it would have been impossible for Gates to unravel the skein of the mind’s illusions and to arrive at that kind of skill to discover the science of Consciousness.

In other words, he inductively determined that the first experiences with things are sensory: that the mind groups into one cluster the sensations derived from one object, then puts like objects together, and then studies the relations of these classes. In cognitive mentation we begin with sensations and are not concerned with their origin. A real and true classification of the data of a science will consist in sensations, images, concepts, ideas, thoughts, and introspects. Incorrect and incomplete images, false concepts, and untrue ideas and unproved thoughts win not fit in

such a psychotaxis. There are no experiences except mental ones, and when remembered, all become cognitions and are as such intellections. A pain is not an intellection, but the memory of it is. Thus one may have intellections of all the feelings and conations. The simplest process of the intellect is sensating, and its simplest states are sensations. If we name a sensation or image, we add certain elements and make a concept of it. If we perceive a sensation as such, it is by an act of perception that involves the fourth kind of intellectual data and the corresponding fourth process of ideation. The unit of perception is the ideated concept.

Intellection Gates defined as the consciousness of relations and a process by which we become conscious of relations—the product and process of that kind of mentation called the

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intellect. “Relation” is a comparison or connection between things that would cease to exist if one were annihilated. Thus the moon bears the relation of being smaller than the earth; if the earth were annihilated, the relation would cease to exist.

He found that when intellections were psychotaxically diagrammed, the classification was self-indicating of classic truth and self-eliminating of classic error. The data of a science were reduced to an incredibly small compass. It would take many volumes, for instance, to contain an encyclopedic epitome of electrical science, but a psychotaxis of all the images, concepts, ideas, and thoughts ever discovered relating to electricity could be put in one small volume. The psychotaxic system of observing the data of a science was a more complete and efficient method of avoiding theory and illusion. The only kind of mental content worth introspecting and re-functioning was the data of a science. He found too that this system produced more discoveries, as in his work with acoustics.

Gates established an important law: that a psychotaxis of the intellectual states relating to a science is at the same time a psychotaxis of the data of that science, and the two are mutually corrective. The taxonomy of the objective and subjective worlds must agree in one psychologic classification or psychotaxis. The psychotaxis of conscious mental states (derived from actual experiences of consciousness with the phenomena of a science) is a *psychologic classification of the only possible data* of that science, being a more truthful and advantageous classification of facts and laws, divested of the usual content of theory and hypothesis. This classification, based on the *actual likenesses and differences* of the conscious states as they are *directly and immediately introspected*, puts classic order, simplicity, and light into a subject hitherto almost hopelessly chaotic and dark.

A psychotaxis of all the experiences that the mind of man is able to get from a study of some one class of phenomena, for example chemicals, constitutes the science of that domain of nature and knowledge. There are, or ought to be, as many

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sciences as there are groups of objective and subjective things and classes of relations; that is, as many as there are actual experiences of consciousness.

What classes can the mind have? That is, from how many distinct domains can the mind get intellections (sensations, images, concepts, thoughts)?

Gates had already taken the first step in answering this question when he made and classified the inventory of his total rememberable and active mental content. It was the most exhausting work he had ever done. Each memory was listed with some like group. Every thing and meaning that was named in English, German, French, Latin, Greek, and several other dictionaries was likewise, word by word, assigned its place.

He found after many corrections, additions, and approximations that all data related to certain great groups of subjects or domains of nature (objective and subjective); and no data could be found that did not come within one of these groups. The classification grew out of the data inductively, and not by a priori or armchair speculation, he emphasized. He had classified about everything the language of man had named and everything he could fish out of the memory of himself and several others, and could find no other states or data (there were more of course, he pointed out, for much was omitted, but the general conclusion was not affected). Afterward he found many new meanings, for which he coined names or assigned symbols, but these states fell into their classific places.

He arrived at the following *classification of the sciences*—

1. Experiences of the mind with *itself* (comprising the data of introspective psychology).
2. Experiences of the mind with *other selves* or living things (such as comparative psychology, sociology, biology, bacteriology).
3. Experiences of the mind with *matter* (such as chemistry, mineralogy, crystallography, radiology).
4. Experiences of the mind with *motion* (such as acoustics,

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mechanics, thermodynamics, optics, electricity-or physics broadly).

5. Experiences of the mind with *quantity* (mathematics broadly).

6. Experiences of the mind with *time sequences* (history, evolution).

7. Experiences of the mind with *Consciousness*.

This method of classification, he noted, differs from other methods such as those of Comte, Bain, Spencer, and Ward, in that it is a psychological classification (psychotaxis) of the sciences, and therefore conforms more nearly to the way in which the mind knows and creates the sciences. These groups are subdivisions of mental experiences and consequently of *psychology*. Hence from the mind-using standpoint, psychology is not only the one science but the science of sciences, just as the Mind Art is the art of arts.

So Gates' early view of the sciences and arts as mental products, and his study of them to find out more of the nature of mind and knowledge, were justified in these results. He was often asked: "Why do you devote so much time and prominence to the experimental study of the sciences when your laboratories are devoted to psychology? Why study music, metallurgy, microscopy, photography, electricity, and the am generally?" Not only are the sciences discovered and known by the mind's activities and in no other way, he answered, but each science is a particular *mode* of mental functioning and *kind* of mental content that grows, when rightly learned, more mind and brain relating to that domain and makes it more operative in the mind. Only to the extent that the mind has knowledge of these first six domains can it be considered fully normal—that is, in full functional relation and responsiveness to all domains of cosmos. Only as it possesses some knowledge of each can it have the fullest and safest conduct guidance. If it has acquired no enregistered brain-structures corresponding to any particular domain, it will be abnormal; and to the degree that the mind

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has acquired untrue knowledge and thus enregistered false brain structures, it will be pathologic. This conclusion followed from the data; it is a revolutionary and startling truth.

In like manner the arts represent what the mind has done in applying knowledge. The mental process is not completed until the truth known, the beauty felt, is rendered into deed. "These splendid results," Gates exclaimed, "elated me almost beyond endurance; the joy was unique, the discoveries were so precisely

what I wanted to know.” He could not quit thinking about them, even at night. To cure his over absorption he put in more time in his laboratory at experiments that required physical effort, and after a few weeks he began to rewrite the already often revised account of his researches to include the new discoveries. It required the recasting of almost every paragraph, and much new nomenclature was introduced. He was delighted that the Newer Introspection, even while being born, revealed its practical nature by producing these steps.

Even at this time he realized that his new methods could not be learned outside the laboratory. The data for an art of discovering must be derived from an inductive study of the objective world by observation, experimentally directed—and of the subjective world by introspection, experimentally directed. A theory, he found, is not a true mentative datum. Only a fact is, and not only if heard about. Then it is an “accept,” to use Major Powell’s term. Valid mentative data consist in actually experienced sensations, in images derived from actual objects by inductive observations, in concepts actually acquired by grouping images of objects, in ideas inductively acquired by experimentally relating objects, and thoughts resulting from the generalization of ideas. Data not thus acquired, for which the sub-units are missing, are not mentative data. Statements are not data merely because they are plausible or sincerely believed; they are not valid unless known to be true, and the only mode of knowing so far is induction-and induction consists in sensating, imaging, conceptuating, ideating, thinking, and introspecting.

This new taxonomy of mind and new taxonomy of a science

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are not two taxes but one psychotaxis: a discovery resulting from his deliberate application of the mentative art. When once comprehended, this method of classification takes full possession of the mind; and he cheerfully predicted that psychotaxis is an ideal that will work out its own fulfillment. “Psychotaxis when accomplished will be the world’s most valuable possession. The modern age has no task more important,” he declared, “than the ascertainment and strict validation of the data of the sciences; and no step is more important than learning how to use the mind.”

With the advantage of these new methods, he systematically and laboriously went over the data of several sciences. It was a formidable task to re-functionate the images, concepts, ideas, and thoughts of some domain of nature and to practice the operation of analysis and synthesis with the results, and still more with several sciences. But out of it arose a great practical skill with

introspection; his whole mind was augmented in capacity, and many improvements resulted in the art of mentation.

It was during these laboratory studies of the way the mind learned, that Gates assumed a more critical attitude toward the subconscious that enabled him to break away from its “thralldom.” He wrote: “Out of the myriad functionings that are going on below my consciousness, even when it stands tip-toe on the misty, mental mountain top to see the dawn, there come myriad pictures and feelings and impulses and insights out of the phylogenetic past, tintured with all that is animalistically basic in that past and also with much that is lower than my present levels of conscious civilized life; and I have seen the absolute necessity of using the subconscious functioning as a slave and not allowing it to become master over the conscious knowledge guidance. The subconscious is like the pent-up waters of a great dam which you may turn on and cause to run your mill wheel, or you may let them break through the walls and destroy you.

“When in the semi-light you look into indistinctly illuminated regions and see ghosts or gods, according as your fancy directs,

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or when you look upon daubs of coloring on the wall in half-dreaming wakefulness and see sometime a beautiful maiden or an ugly monster, or when you look at the clouds and like old Polonius see a whale or a camel as the momentary whim chooses —so I find the subconscious deals with the ontogenetic memories and phylogenetic instincts and desires, and creates out of them ceaselessly and with astounding rapidity all kinds of false, half-true, and often new and beautiful in-sights, which the conscious intellectual life may validate and use according to its methods and do safely. But to mistake these promptings and symbolic visions and insights as coming from something *higher* than the conscious self is one of the horrible mistakes of mysticism and of the past, and is the central danger of inspiration. The word sent you out of the subconscious is not the voice of God—it is the cry of slaves for a chance to serve. This power of the subconscious is one of the infra-logical processes which the conscious intellection must learn to use as a tool.”

The subconscious has been the subject of much speculation and misunderstanding. But from that time on Gates knew the true place of its functionings and how to utilize them as physiologic and psychologic workers by which conscious processes are carried on. He saw that there could be no intellectual authority in the subconscious; it was demoted as a wise guide in any matter for which there was knowledge guidance. The physiologic processes

and instincts are inherited just as is our esthetic nature; and all are part of the subconscious, non-volitional “urge of life.” The instincts have been inherited from a past out of which we have evolved, if in progressive evolution, and the verdicts of the subconscious are on a lower plane and of a lower order than those of the present conscious mind. If we found ourselves in retrogressive evolution, some instincts might be on a higher level.

By the subconscious states and processes Gates meant all those conatus-activities of an organism that are necessary to produce conscious states and processes, functionings out of which conscious states may arise and upon which, in turn, conscious states may act and thereby influence the activity of the organism.

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The subconscious is therefore the general name for an organic functionings that take place below the consciousness of the individual. All rememberable experiences are in the keeping of the subconscious-ness; that is, of the subconscious memory-processes. The subconscious contains all that portion of Me, mind, and self of a creature that does not become conscious to it, including a memory while being recollected. Within subconsciousness lie the mystery of heredity, the wonders of ontogeny repeating phylogeny, and the marvels of life and consciousness. It is the name of the conatus of an organism and especially of the activities and states of the cerebrospinal and sympathetic nervous system. Subconsciousness lies underneath consciousness like the unseen foundations of a lighthouse.

Subconsciousness is simply, Gates summarized, that part of the mind that has become so automatic by generations of repetition that it no longer rises into consciousness, and that part whose stimuli and states are too weak to rise into (above the limen of) consciousness.

We inherit no intellections—*not one*. They have to be acquired by conscious experience with the present, local, individualistic, temporal, and particular environment and self. They would not be of adaptive value otherwise. For a given individual and environment the guidance of an instinct may be wholly wrong and fatal; if there is not reliable and trusted knowledge relating to any impulse out of the subconscious, then he will be at the mercy of instincts adapted to a kind of self and environment that no longer exists. The safe guide to action (conduct) is conscious knowledge, and upon its extent and validity depend safety and success. Upon intellection we depend for directive effort. In this subconscious realm lie the infralogical or sublogical processes. Gates now saw it to be the province of intellectual processes and validation to utilize only those subconscious functionings that are involved in the

physiologic and psychophysical carrying on of intellectual processes and normal esthetic states; and in this, scientific knowledge is the only guide.

“A leading, or instinctive impulse-to-do, is a blind tendency

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which may defeat itself or succeed, as may happen without knowledge guidance. An insight, upon which mysticism has looked as communion with God, interprets itself by the aid of the knowledge and beliefs and suggestions found in the brain of the mystic. The subconscious knows not whether these beliefs are true or not and has no way of knowing; it does not judge between true and false, good or bad, useful or useless, helpful or harmful, but accepts what the brain tells it and goes ahead as blindly as an avalanche. A blind trust of the mystic in the authority and wisdom of mysticism has been the ‘False Guide’ in that line of effort.” Although he was not a mystic, Gates emphasized, he demoted insights and impulses-to-do to their proper lower level and used them as willing workers, ever active when a task is set, suggesting combinations of “material” furnished the subconscious of which he could never have thought.

The subconscious is the basis of suggestive therapeutics; it will perform physiologic feats according to the suggestion made, provided the person *believes* what he tells it. In the same way an

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intellectual process is physiologically carried on by the subconscious it sets spontaneously to work, and in regard to any problem many ideas occur in quick succession, which may be true or false until the intellect validates them.

“In this domain of the subconscious,” he continued, “are heard the echoes of all the old faiths and fears, idols and incantations, worryings and worships of thousands of generations of ancestors; and these echoes are not the ‘still small voice’ of the Most High, but dreamlike vestiges of our phylogeny. Gaze upon a mottled wallpaper in a dim light and the subconscious will create picture after picture, re-combining and often adding what is not there. So the subconscious uses all your memory-content and instincts and dream-memories, and the echoes of old struggles and joys, and creates combinations of all kinds; and if you are trying to solve a problem it will suggest countless combinations until often the conscious mind finds one that proves to be true. This is Poincaré’s theory of the way his mind discovered the solution of mathematical problems; and the same experience all naive discoverers and inventors have had. It is the old way to mentate, but not the scientific way. The new way was born out of the old; and out of

readings (impulse-insights) were suggested to my conscious mind steps that, under the *guidance of scientific method*, led to the Mind-art.”

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