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**THE RELATIONS AND DEVELOPMENT
OF THE
MIND AND BRAIN**

by

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PUBLISHER'S PREFACE.

Since the articles which comprise this little book were published in THE METAPHYSICAL MAGAZINE, there has been a constant demand for a handy form of them for convenient reference and use. The subject as presented by Professor Gates, appeals to thousands who do not have time or opportunity to enter into extensive studies in psychology, and the results of his discoveries prove intensely interesting to all active minds regardless of previous experience. They represent original work of great importance at the present time. The continuous demand being made, is our reason for reproducing the writings in this form which, we trust, will meet the requirements.

We believe that further investigations in similar lines to those described by Professor Gates will help to solve some, at least, of the mysteries of the mind.

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The Art of Mind Building

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A personal interview reported for the *Metaphysical Magazine* by George J. Manson.

The Art of Mind Building

The first experiment in my investigations regarding the mind consisted in giving certain animals an extraordinary and excessive training in one mental faculty—e.g., seeing or hearing—and in depriving other animals, identical in age and breed, of the opportunity of using that faculty. I then killed both classes of animals and examined their brains to see if any structural difference had been caused by excessive mental activity, as compared with the deprivation or absence thereof. During five or six months, for five or six hours each day, I trained dogs in discriminating colors. The result was that upon examining the occipital areas of their brains I found a far greater number of brain-cells than any animal of like breed ever possessed.

These experiments serve to localize mental functions, and, above all, to demonstrate the fact that more brains can be given to an animal, or a human being, in consequence of a better use of the

mental faculties. The trained dogs were able to discriminate between seven shades of red and six

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or eight of green, besides manifesting in other ways more mental ability than any untrained dog.

The application of these principals to human education is obvious. A child that had been trained for six weeks after birth in the excessive use of the temperature senses (detection of heat and cold) was found, after dying of scarlet fever, to possess in the temperature areas of the brain more than twenty-four times the average number of cells. As a matter of fact, the child was able to detect differences in temperature unrecognizable by other children of its age.

Under usual circumstances and education, children develop less than ten per cent of the cells in their brain areas. By processes of brain-building, however, more cells can be put in these otherwise fallow areas, the child thus acquiring a better brain and more power of mind. Brain-building should properly begin a few weeks after birth, because, as soon as the brain is fully developed in all its areas, the child is prepared to acquire, by technical and professional education, special knowledge and particular kinds of skill. If the child has manifested artistic ability, this course of brain-building will not only increase that talent but provide supplementary development to prevent one-sidedness and disease.

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In 1879 I published a report of experiments showing that, when the breath of a patient was passed through a tube cooled with ice so as to condense the volatile qualities of the respiration, the iodide of rhodopsin, mingled with these condensed products, produced no observable precipitate. But, within five minutes after the patient became angry, there appeared a brownish precipitate, which indicates the presence of a chemical compound produced by the emotion. This compound, extracted and administered to men and animals, caused stimulation and excitement. Extreme sorrow, such as mourning for the loss of a child recently deceased, produced a gray precipitate; remorse, a pink precipitate, etc. My experiments show that irascible, malevolent, and depressing emotions generate in the system injurious compounds, some of which are extremely poisonous; also, that agreeable, happy emotions generate chemical compounds of nutritious value, which stimulate the cells to manufacture energy.

I have succeeded in entirely eliminating vicious propensities from children with dispositions toward cruelty, stealing or anger. In curing a bad habit I would for every evil tendency, image, or

craving existing in the same parts of the brain, create a greater number of the opposite kind of

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memories and keep them active a greater number of times each day, until the old structures had disappeared and new ones had been formed. This process does not require the assent of the patient any further than to take the course of studies. He may even not desire to abandon a certain practice or habit, but may wish to continue his evil course; yet, by the force of brain-building, that motive can be eliminated.

This system of developments can be applied to regulate the assimilative processes, the diseases of which are dyspepsia, alcoholism, etc. A woman unable to eat fatty or greasy substances, even in the smallest portions, was by this system trained to take them in normal quantities. The alcohol habit, when not engendered by the habitual and excessive use of liquors, can originate through a certain derangement of the stomach and the brain-cells that govern it. Indigestion, accompanied by fermentation of sweets, creates a small amount of alcohol in the stomach. This alcohol produces a stimulating effect which the patient misses when the fermentation is arrested by the alcohol itself, or by a change in the food. The first step toward curing this habit consists in forming another series of brain-structures of the different stages relating to previous experiences, not merely with intoxicants

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but with foods in general. The creation of at least a hundred times as many morally-functioning cells as there had been immorally-functioning cells will cause the craving for stimulants to disappear. It is possible in three months' time to develop brain-structures which will cause a patient to feel disgust for what he had previously relished and desired.

The late Prentice Mulford says, in one of his pamphlets, that "to think success brings success." Unfortunately, however, such effort has but a limited effect in the usual business life. Aside from lack of training or of knowledge, present defects in business life result from an improper classification of the memories and an erroneous use of mental faculties. The mind is usually filled with disordered, disquieting memories which, as a rule, are accompanied by an equal number of pleasant or unpleasant experiences. Wearisome, unpleasant memories weaken health and do not generate thought energy. Cure is accomplished in expelling these by another crop of wholly pleasant memories, which put the necessary structures of the mind in systematic order and teach the patient; how to use the mental faculties.

I have been asked how far this new science is related to phrenology. Phrenology had the misfortune

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of falsely locating every mental function. For instance, sight was placed near the middle of the eyebrow, whereas its true position is in the back of the head. The absence of all memory-cells predominant in any mental faculty could not be discernible through the skull or scalp, because such absence would not change the cerebral cortex of that part of the brain as much as the tenth of an inch. There is, however, alike in man and animals, a general conformation, not merely of the head but of the entire body, which gives us some knowledge of the mental capacity. This will be obvious to any one who observes the facial angles and other characteristics among monkeys and the lower races of human beings.

These discoveries, by giving to individuals a better use of the mind, open a new epoch in the methods of progress and civilization. It is the mind which creates sciences, arts and institutions—which knows, suffers and enjoys; and it is the mind that must continue to do all that is done. Give to people more mind, and all undertakings will be ameliorated, and better results accomplished. Give them more moral mind, and the evils of society will gradually disappear. If it is possible to give more mentality to people, then at last, through scientific experimentation,

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we have reached a fundamental law of morals.

If you will remember that it is the mind that thinks, feels, knows, and performs physical labor; that it is the mind that rages, plots, and exercises all propensities, whether moral or immoral—then you will understand my meaning when I say that every act is right which, in its immediate or remote consequences, give us more mind, or a better control and use of the mental faculties; and every act is wrong which, immediately or remotely, produces the opposite result. There can be no other right or wrong. An evil memory promptly antagonizes the functioning of the good memories, slowly poisoning not only the body of which the memory is a part, but memory itself.

A statement made some months ago, by being falsely reported, has done me much harm. I was alleged to declare that sin is pink in color. It is, however, as inaccurate to speak of the color of sin as of the moral qualities of a vacuum. If an evil emotion is dominant, then during that period the respiration contains volatile poisons, which are expelled through the breath and are characteristic of these emotions. By applying chemical reagents I can detect the presence

of these poisons, because a precipitate is produced; and this precipitate generally has some color. In the case of

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grief, for instance, if I use rhodopsin for my reagent, the color will be pinkish. Other reagents will produce other colors.

My researches in brain-building have led to a demonstration of the evil effects of hypnotism. This practice produces a species of congestion of the brain. The pupil in the science of mind-structure who desires to achieve good mental and moral character must avoid hypnotic experiences, under no circumstances permitting himself to be hypnotized—save perhaps, for some absolutely necessary surgical purpose. Hypnotism tends to vitiate the moral character.

The various methods of mind cure, faith cure, laying on of hands, and similar processes that have come down to us from remote ages, have each, some sort of a fundamental verity. One aspect of the truth has been seen, but it is generally, combined with many mischievous practices and belief, and is seldom scientifically applied. My experiments prove that the mind activities create the structures which the mind embodies, or manifests. In addition to massage, diet, regulations of surroundings, etc., modern medicine will eventually evolve methods of brain-building to effect cures. Simple belief that you will get well; will, in a measure, produce nutritious

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products and stimulate the health of the entire body. The indulgence of certain emotional states will do the same. To achieve any certain result, however, the process must begin with the first stages of brain-building and be pursued systematically to the highest stages, in order to create in the brain those structures which govern different portions of the body. This can best be done by the methods I have described.

The value of this new science will be better understood when we remember that mind underlies all sciences, art, and institutions. The mind has produced all our paintings, poems, literatures, languages, architectures, governments, and religions. Your mind is, to you, the most momentous and important fact in the universe; for without your mind, what would be the universe and its possibilities to you? Take away your mind, and what would there be left? To your own mind you must always look for guidance. If you can get more mind, or a better regulated mind, you will fundamentally and directly promote all your undertakings. You will be better able to apply whatever knowledge you possess.

Real progress among peoples is the degree of their mental development. To test this statement, imagine progress in

civilization which at each step

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produces less and less mind! To give people more mind is at once to promote all reform and all progress. If evolution did not lead to more mind, it would be retrogression.

As my investigations and experiments in the art of mind-building are directly related to psychology, the reader may ask my definition of that term. Psychology is the science of mind. The word comes from the Greek "psycho," meaning soul. The earlier psychologists, being metaphysicians and none of them experimentalists, believed that in their speculations they were dealing with the faculties of the soul. Whether they were or not is not the question now under consideration. The art of mind-building and the art of mind-using, which I have evolved from the data of psychology, I have named "psychurgy."

The experimentalist knows mind only as he finds it manifested in himself and in other living creatures. He believes that this entity cannot exist apart from structure. Mind, however, is not a function of the brain in the same sense as bile is a secretion of the liver. The functioning of the individual organism is but one factor of mind. A more important factor is the fundamental connection of the individual organism with the cosmic environment. Mind may be more than this, but

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at least it is this. I make no distinction between mind and soul. I do not attempt any definition of mind further than that it is the totality of the sub-conscious and conscious adaptive functions of the organism in interaction with the Cosmos.

Modern psychology began within the last fifty years with Fechner, Helmholtz, Wundt, and their followers. They commenced to measure sensations and times of reaction, to study the effect of diseases upon the brain, and to make investigations of the cerebral cortex through electrical stimulations of those areas and through ablations and excisions thereof. As a result, we have physiological psychology, or psycho-physics.

I shrank from vivisection and regarded the results of Horsley's and Monk's experiments upon brains as somewhat untrustworthy, because, when you remove a portion of the cortex (the outer line of gray matter which covers the cerebrum), you destroy the fibrous and the blood-vessel connections with other brain areas, producing a pathological but not a normal result. In the first part of this interview I described my experiments upon animals by a method which does not require vivisection and which does not produce diseased results.

This brain-building process embodies a number

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of successive stages. The first stage consists in enregistering the sense impressions of all the senses, so as to produce sensation-structures. In the new nomenclature, cognizance of a sense impression is called "sensation." The conscious state which we call "perceiving a sense impression" produces a chemical deposition of matter in the brain-cells, and each repetition of that sense-consciousness increases the amount of matter deposited, the result being a sense-memory structure. The refunctioning of that structure constitutes memory.

As soon as all the sensation-structures have been formed in the brain, we can begin the second stage, which consists in causing the child to discriminate between the different sensations previously acquired and to associate them in consciousness, so as to produce what is called an integrant of the second order, or images, the units of which are the sensations of the first stage of brain-building. And so on through thirty or forty successive stages.

This process can be applied up to the period of decrepitude, but it is probable that it can be fully realized only when commenced with infants; and, inasmuch as the germ-cell of the female is directly affected by the nutriment which it gets from the parents' blood, it follows that a proper course of

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living before conception will directly affect the development of the child. My experiments have demonstrated that every emotion of a false and disagreeable nature produces a poison in the blood and cell tissues. These poisons affect the health of the germ-cells. During pregnancy, life-depressing and unpleasant emotions—grief, anger, sorrow, etc.—will, through the poison generated, affect the development of the fetus. For this and other reasons brain-building should properly begin a few months before conception.

Out of these researches arose not only a method of mind-building, or mind-embodiment, but also the art of using the mind systematically in original thinking, which art may be subdivided as follows: (1) the art of systematic, originative, conscious mentation; (2) the art of systematic sub-conscious mentation; and (3) the art of systematic originative, co-operative mentation. These arts lead to original thinking, invention and discovery by a systematic training in the use of the intellectual, emotive, and conative lines of mentation, and in each of the mental faculties. The pupil desiring to discover new things in any science has his brain rebuilt with reference to that science. This is the first step. He is then taught whatever knowledge the human race has acquired concerning that

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subject, and to each of these data he is trained several hours a day, for a few years, to apply each one of his mental faculties.

The rules of this art have been derived from many thousand experiments and observations, and by practical application to myself and pupils. Two men of equal knowledge may study the same phenomena and the same data, and one of them will evolve original ideas and, make discoveries, while the other will add nothing to our knowledge of the subject. Now, the mind art will enable the former to do better thinking, and will so train the latter to use his mind that he, also, will make discoveries and originate ideas. At present almost every organic and cosmic law of originative mentation is persistently violated by the investigator.

With the sum of human knowledge in any science classified in the mind; with a rebuilt brain from which evil affections and emotions have been eliminated; and with proper regulation of the body and its surroundings, the pupil commences to practice the art of original thinking somewhat as follows: According to rules which must be learned to be understood, he exercises every one of his thirty or forty mental functions upon each proposition or datum of the science, in order that

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each faculty may be active a certain number of hours each day. This produces brain-growth in those very parts of the brain which are needed to deal with that subject. As the new growth is acquired, day after day, the sub-conscious functions become stimulated, the cosmical interactions of the brain become more vivid, and new ideas dawn as suddenly as lightning illuminates a landscape. New congruities and generalizations are achieved, and, as a result, a reclassification of that knowledge must soon be made. Then the pupil again applies each mental function to each one of those data until he gets a new growth in those parts of the brain needed for the study of that particular subject. Six months' practice generally quadruples the mental capacity and more than quadruples the number of ideas gained each day. Such ideas must always be tested for truthfulness by observation and experiment in that domain of nature to which they relate.

Then there is the art of regulating the sub-conscious mental functions. At least ninety-eight per cent. of our mental life is sub-conscious. If you try to remember what happened on your tenth birthday, it may be ten minutes before you can recall any incident. What occurs while you are trying to remember? Certainly not conscious

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processes. The processes of memory are in the subconscious domain.

If you will closely analyze your mental operations you will find that consciousness—conscious thinking—is never a continuous line of consciousness, but a series of conscious data with treat intervals of sub-consciousness. We sit, trying to solve some problem, but fail. We rise, walk around, try again, and still fail. Suddenly an idea dawns which leads to the solution of the problem. The sub-conscious processes were at work. We do not volitionally create our thinking. It takes place in us. We are more or less passive recipients. We cannot change the nature of a thought or of a truth, but, we can, as it were guide the ship by moving the helm. Our mentation is most largely the result of the operation of the cosmic Whole upon us. Annihilate the Cosmos, and our thinking would instantly cease.

Sub-conscious mentation is regulated by maintaining proper conditions of the body and environment, i.e., the forces which affect the body. Cooperative mentation consists in a number of specialists applying the art of conscious mentation to the same subject at the same time. If all the great minds of the human race were trained in this mode of systematic mentation, and if they were

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to take for their subject the sum of human knowledge, they would achieve an interpretation of the universe which we may call philosophy, using the word as the synthesis of the generalizations of science. The result of each day would be a stepping-stone for the next. And if such minds, trained in these arts of originative mentation, were thus to deal with the whole scope of human knowledge systematically, they would continually eliminate former errors and constantly add new insights and new discoveries to their interpretation of the universe.

Such a perpetual, reorganized philosophy I have called “omnism.” This philosophy is the highest generalization that can at any time be achieved by a number of the ablest minds practicing cooperative mentation upon the sum of human knowledge. It is not realism, nor idealism, nor monism. It is, of course, a synthesis of all philosophies and branches of knowledge by specially constructed brains, acting according to systematic methods of mentation which begin by eliminating the immoralities in the mind. Such a philosophy could never become a fixed creed or belief.

Mentation is mind in activity. Using the word “psychology” as including all of the sciences of

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mind, I may further define it by saying that there are six experimental sciences of mentation; and the generalizations which arise from a synthesis of the data from each of these six domains of research constitute psychology proper.

The first of these six domains is comprised by Biologic Psychology. In this realm the investigator experimentally varies the structures of the organisms and the conditions of their environment in order to discover what mentations result from each variation. This includes most of what is called physiological psychology and psycho-physics. After many hundreds of experiments in this line I established a new method of research in biologic psychology. It consists in giving organisms new anatomical structures or in taking anatomical structures away from them in order to see what mental activities appear and disappear with the coming and going of these structures. No; I do not vivisect, mutilate or graft! I do it by a rapid process of evolution and retrogression. I evolve the structures of organisms in the process of rapid evolution to higher or more complex structures, or to lower and simpler ones. I raise several million infusoria (animalcules that occur in infusions of decaying substances) in a tank, and then, by gradually increasing heat or cold, or concussions,

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I destroy all except two or three proved to be the most capable of surviving. These survivors propagate several million more, and, generation after generation, the process is repeated. After about twenty-one months, new structures arise, and I made a note of the concomitant mentations, or adaptive activities which also arise. As a method of psychological research, this is new.

I am organizing a laboratory of subjective biological investigation which will contain a great many new instruments.

I am also organizing a laboratory of subjective biopsychology, with special apparatus never before seen by psychologists. This science varies, one at a time, the environmental conditions of the pupil, and he observes the effect produced upon his own conscious mentations. The moods and intellections are found to vary with the electrostatic potentials—humidity, altitude, etc. I have found that, for successful mentation, it is as necessary to maintain high electrostatic conditions in the student's room as to maintain a healthful temperature. The potentials referred to are the electrical changes in the atmosphere. These electrostatic potentials of the atmosphere change constantly, varying often many million of volts every hour. Every change makes an

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alteration in your emotions, your secretions, your excretions, and your whole mentation.

I am also starting a third laboratory—sociological psychology. A prominent scientist recently said that this is the first step toward experimental sociology. I will have special apparatus, much of which is now being made. Sociological psychology consists in varying the environment of social groups of living things, such as a bevy of birds, a school of fish, a hive of bees, etc. As we vary the social structure of the environment of a social group, changes take place in the group-activities. This also is a new method of psychological research. I shall have three other laboratories—six in all. There are six methods of research, which include all possible methods of experimenting upon the mind, and these include much more than what is usually called psychological experimentation.

The mind has created all sciences; consequently, they must all be studied as products of mentation. Included in these six studies are all sciences, which will be studied as subdivisions of the science of mind. A synthesis of the generalization of these six sciences, therefore, will be a synthesis not merely of the six psychological departments, but of all the sciences included therein. The synthesis

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of these sciences constitutes not only Psychology, but Philosophy also.

Just as correlated with the science of chemistry there is an art of chemistry, so with the science of mind there is an art of mind, or mind-art, more properly called Psychurgy. The latter includes the three arts of getting more mind and the three which pertain to its proper use. The arts of getting more mind are those of Brain-building, Character-building and Immorality-curing and Education. The arts of mind-using are those of conscious originative mentation, sub-conscious originative mentation, and co-operative mentation. The syntheses of these six arts constitutes a synthetic mind art, or Psychurgy.

The experiments I have made contradict the conclusions of Weismann and others regarding heredity. They claim we have no proof of a skill, an idiosyncrasy, or a habit acquired during the lifetime of an individual, being transmitted to that person's offspring. They mention circumcision as practiced by the Jews generation after generation, asserting that it is not transmitted. The mutilation of a Chinese woman's foot they say is not transmitted. I say it could not be transmitted because the change does not originate in the mind. If I train an animal in the excessive use of some

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one mental faculty, its germ (or reproductive) cell will be influenced in its nutrition through the parent's changed metabolism, which is produced by the changed character of the mentation. I have trained four generations of guinea-pigs in the use of the visual faculty, and the children of the fourth generation were born with a greater number of brain-cells in the seeing-areas than other guinea-pigs that had not been thus trained. The experiment has been successfully repeated several times, and it demonstrates the transmission of acquired characteristics. I have found in the unicellular organisms, i.e., small protoplasmic cells, when they are caused to respond generation after generation to some one stimulus in excess of all other stimuli, that there gradually arise specific anatomical structures produced by the mental activity which responds to that stimulus. In this experiment, the cells which do not respond as readily as others are not destroyed, but are allowed to propagate as freely as the rest; hence the Darwinian factor of "survival of the fittest" is eliminated, i.e., favorable and unfavorable variations do not signify. The conclusion is that mental activity creates in mental organism certain structures transmissible to their offspring.

In regard to heredity and freedom of the will,

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I have this to say: We are all conscious of being capable of doing as we please; if we please to do wrong we find ourselves capable thereof, and *vice versa*. If our motive for wrong-doing predominate—if the majority of our effective and emotive states, our appetites and desires, lead us in a certain way and we have enregistered no mental experiences of an opposing character, or at least not enough of them—then it will be our will to do as our motive leads us, i.e., as we choose.

This question of choice and of motive is based upon the character and degree of mind that the person has embodied or inherited. A person can inherit tendencies of growth in certain parts of the brain. His memories of sensations, images, concepts, emotions, and activities must come from experience. If a majority of these memories, relating to a certain object or event, are pleasurable, the person will naturally like it. If a majority of the experiences are un-pleasurable, or evil, he will in the one case not like the object, and in the other he may either like it or dislike it, according as the evil experiences are pleasurable or the reverse. The person's will is the result of the interaction of the totality of his memory-structures relating to any given object or event. It is possible completely to change the dominance of his desires and motives,

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likes, and dislikes, etc, by enregistering in any part of his brain another series of memories, and, by so doing, you control the will. This is called "auturgy"; it is the art of systematically controlling the will by a process of brain-building and character-building based upon a taxic registration of experiences with the Ego.

The power which is active in the mind to control the will is a centrimmanent force of a cosmical character, omnipersonal, unitary, and the basis of Auturgy.

The Laboratory of Psychology and Psychurgy is now the scene of experiments in these various lines. The Laboratory is growing in completeness, and its purpose is to study the mind scientifically, to diffuse the knowledge thus obtained, to cure immoral dispositions, to train investigators, and to organize research along these lines.