

33
360
955
. 9

Occult Anatomy

and the Bible

IX

*The Role of the Ductless
Glands in Spiritual
Attainment*



By CORINNE HELINE

First Edition, 1937
Second and Enlarged, 1947
Third and Revised, 1952
Fourth and Enlarged, 1964

NEW AGE PRESS, INC.

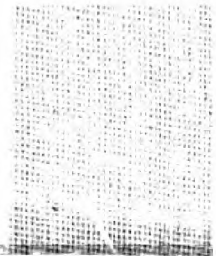
NEW AGE PRESS, INC.
P.O. Box 372
Oceanside, Calif. 92054

P. O. Box 423
SANTA MONICA, CALIF. 90406

*The Role of the Ductless
Glands in Spiritual
Attainment*

By CORINNE HELINE

This is the ninth in a series on
OCCULT ANATOMY AND THE BIBLE
that contains twelve titles in all.



133
H365
1955
V. 9

OCCULT ANATOMY

A KEY TO BIBLE MYSTERY AND A KNOWLEDGE OF SELF

One of the seven keys to the Bible is the physiological. Few realize how literally and profoundly true it is that man is made in the image of God. Yet God is not to be thought of as anthropomorphic. It is man who is to be recognized as divine.

Man contains within himself all the principles of Deity. They are as yet manifest only in small part. It doth not yet appear what man shall be. But there is much that we can learn about that which is still unmanifest, and such knowledge can go far toward helping us to consciously and systematically unfold the hidden latencies.

Man is a god in the making. He is a miniature universe. In ancient days, a manikin was placed on the altar as a symbol of man's divinity, and in which aspect he was an object of the deepest vener-

ation. Consonant with this truth, a modern occult teacher recommends three books as of prime importance to every occult student, namely, the Bible, a dictionary, and a textbook on anatomy.

Paracelsus also recommends the study of three books above all others; Nature, Man and the Bible, the latter interpreting the other two. And these three Books it is that form the subject matter of this series on Occult Anatomy.

PHYSIOLOGY AND THE DUCTLESS GLANDS

There are two species of philosophy, one of heaven and one of earth. The philosopher is acquainted with things of the lower sphere, the astronomer with things above. In their medical aspect, philosophy is concerned with Earth and Water in man, and astronomy with Fire and Air.

—Paracelsus

In the above quotation, the element "Heaven" correlates with the mysterious "fifth essence" of the alchemist, an element whole in itself, containing the lower four elements in a spiritual unity. It is sometimes called AZOTH, a word symbolizing "alpha and omega," the first and the last.

In occult anatomy this spiritual essence is most active in the chain of etheric centers which material scientists deal with under the name of *endocrine*

glands, glands of internal secretion. It is a curious and thought-provoking fact that esoteric teachers of the Orient taught for many centuries the existence of certain centers which they defined as foci of spiritual power. It is now discovered that these centers are situated in almost the exact various ductless glands. The word endocrine is derived from two Greek words, *endon* (within), and *krinein* (to separate).

The seven principal endocrine glands are the pineal and pituitary in the head; the parathyroids, thyroid and thymus in the region of the throat and chest; the spleen and adrenals in the abdomen. We may also include among these glands the pancreas and the gonads which have an endocrine function in addition to the one ordinarily known.

The endocrine system is the anatomical sphynx.

During centuries of research by anatomists and physiologists the function and purpose of the endocrine glands remained undiscovered. Not until the present century were their functions studied and reported upon to any extent.

Theophile de Borden, a physician at the court of Louis XV, was among the first to state clearly

the function of internal secretions. Eustachias, an Italian anatomist, reported the discovery of the adrenals in the year 1563. However, for long after this the study of the ductless glands consisted largely of picturesque speculations. In 1716 the Academy of Science in Bordeaux proposed as a subject for competitive essays "What Is the Use of the Suprarenal Glands;" In 1850 Curling, an Englishman, connected the thyroid with goiter. Continuing on the subject, we quote the following from an unidentified newspaper clipping.

Living in Paris in 1886 a young physician, well prepared scientifically and alert both to aid his patients and to advance the healing science to which he had dedicated his life. His name was Pierre Marie. To him came in quick succession, two women suffering from a curious combination of symptoms. They had frequent severe headaches, the cause of which could not be discovered. In addition, both of the women complained that their features had so altered since the beginning of the headaches that even close relatives sometimes failed to recognize them. Their faces had grown broader and coarser, the bones of their legs seemed to be growing thicker, even the palms of their hands were becoming daily broader and the fingers thicker and more bony.

Perhaps if only one such curious case had reached Dr. Marie he would have thought little of it. Physicians, then as now, saw many patients whose condition proved peculiar and difficult to understand. But two such patients at the same time, both with the same symptoms and with symptoms as curious as these were, was too great a challenge to Dr. Marie's curiosity to be ignored.

He studied his two cases very carefully. Each developed, as the illness progressed, what was clearly a tumor of the brain. Further investigation showed that the brain tumors were located precisely at that little, neglected appendage just underneath the brain which anatomists knew about but did not understand. Both of the unfortunate patients were suffering, Dr. Marie proved, from a disorder of the pituitary gland.

That was the first clue to the purpose of the pituitary and to its duties in the human body. Dr. Marie and other physiologists followed up the clue. We now know that it is that small pituitary gland, no larger than a cherry, which directs the growth of the human body, so that normal children grow normally and not into giants or dwarfs.

Indeed, the rare individuals who do develop into giants or dwarfs do so, it is now known, chiefly if not entirely as the result of some derangement of the pituitary gland. Not even the

whole of the pituitary needs to be involved in the derangement. Small as the whole gland is it contains three separate parts, only the foremost one of which, as it lies in its small saddle in the base of the skull, is the one that makes the human body grow as it should or as it should not.

Among the more important recent studies on the subject is the treatise by the late Dr. Louis Berman of Columbia University, entitled *Glands Regulating Personality*.

"There are in the body," writes Dr. Berman, "certain glands which, though small in size, are important in function. They are now known to be connected with growth, metabolism and nutrition. They also maintain or upset mental balance by certain secretions which they pour into the blood. Their disordered condition can throw man into a permanent condition of fear, anger, despondency, until he becomes a drug addict—drugged or hypnotized, as it were, by the action of these little glands."

Such pronouncements as these are intensely interesting to the occultist. He knows they are based on truth as far as they go. There are no other organs in the human body that require for

their understanding more knowledge of the inner vehicles of man and their action and reaction on the physical body.

The glands with which physiology has made us most familiar may be defined as organs which produce useful chemical secretions. The liver, for example, produces bile, the glands of the mouth secrete saliva, and so on. These glands have ducts through which their products are channeled into the parts of the body they specifically serve. Thus bile goes into the intestines, saliva into the mouth, the secretion of the sweat glands onto the skin.

Now such is not the construction and office of the glands with which we are here concerned. They are seated more deeply into the body and possess no ducts through which to pass their secretions into a specific organ or area of the body. They are *ductless*; they have no canals to the exterior; and their products enter directly into the bloodstream and the lymphatics. They serve the body as a whole. They are, in fact, a mediating set of glands between the more external and larger organs in the body and the set of psychical centers situated in the vital or etheric body.

These glands, as already noted, are also called

the endocrine or hormone-producing glands. The word hormone comes from a Greek verb meaning "to arouse" or "to set in motion," and is used by science to describe a substance which is formed in one organ of the body and then conveyed by the blood to another organ upon which it has a stimulating effect. The word endocrine refers to both substance and gland. Deprived of their own especial endocrine substance, neither the muscles nor the cells of the body could function.

The occult scientist has knowledge connected with the ductless glands which is not accepted by *materia medica*, but which sheds much light on some of the problems that baffle the physical investigator. One important fact is that these small organs do not belong to the physical body, but to its vital or etheric counterpart. The ductless glands and the blood are the highest expressions of this more subtle etheric body. Since all occult development is intimately connected with the etheric double, we can realize how important it is to have an understanding of the nature and function of these glands in relation to the processes of regeneration.

These endocrine glands had their beginning in

the Second Great Creative Day (Sun Period). Their ultimate development belongs to the Christian or Sun Initiation, a stage of development attained only after entering into the Greater Mysteries, which embody the highest teachings of this present Earth Period (Fourth Creative Day). It is significant that knowledge of these glands remained hidden until now, when the Ancient Wisdom and esoteric Christianity is again coming to light. Our understanding of the spiritual and physical significance of their functions is developing parallel with this restored spiritual science and initiatory teachings. The endocrines are especially sensitive to psycho-mental influences, and they will reveal more and more of the curious and remarkable powers which are the concomitant of Initiation. These additional powers are treated at length in Number VI of this anatomy series: *The Two Nervous Systems and Their Relationship to Spiritual Development.*

THE PINEAL GLAND

The pineal gland is a tiny organ resembling a pine cone, as its name indicates, which is concealed in a "cave" a little above and behind the pituitary

gland at the base of the brain and behind the eyes. It contains nerve cells similar to those in the retina of the eye. Spiritually considered, it is the most important and mysterious gland in the entire endocrine system. It makes its appearance during the first month of foetal life. Its size and shape are regulated largely by the mental and spiritual development of the individual. In a remote past the pineal gland was the organ whereby pre-human man contacted the physical world. Physical science corroborates this statement of the occultist when it declares that "All vertebrates possess this relic of the third eye, which was an early organ for the purpose of sensing light and shadows." In the near future this same organ will be our connecting link with inner realms. We may properly refer to it as an organ of inner-world contact. It secretes an etheric light substance in a manner resembling the pine cone's exudation of resin. From this we can understand why Egyptian Temple neophytes wore pine cones bound around their heads to signify their degree of spiritual proficiency.

The pineal gland is the masculine organ of regeneration. In biblical symbology it is Joseph, Father of the Christed man. It is the receptacle for the seed atoms of the desire and mental bodies

before these bodies are formed. The organs of generation and regeneration correspond closely in their physical features. The pineal gland is similar to the male generative organ, and is situated between four protuberances called the *corpora quadrigemina*. Of these four, the two lower are called the buttocks and the two upper the testes. From the protuberance or pointer in the pineal gland invisible electric sparks flow downward, magnetically attracted by the powers resident in the feminine polarized pituitary body. These contacts are of a spiritually regenerative nature. They form the higher counterpart of the physical generative function. It is indeed a wondrously constructed parallelism between the center of generation at the base of the spine and the center of regeneration at its apex in the head. At the one level man experiences physical marriage, at the other, the consummation of the transmutative life which results in the spiritual union of the polar opposites within the individual and which is esoterically termed the Mystic Marriage.

THE PITUITARY GLAND

The pituitary gland is located in the skull just

behind the root of the nose and is enclosed in the *cella turcia* (Turkish saddle), a depression in the sphenoid bone. It is a small double-structured gland, the two parts of which are called the pre-pituitary or anterior lobe and the post-pituitary or posterior lobe.

Subnormal secretion of the pituitary gland results in low blood pressure and general body sluggishness. Children thus afflicted are mentally retarded, apathetic, easily discouraged and lose self-control quickly.

The general effect of supernormal secretion is high blood pressure with excessive nervous and mental activity; also it leads to aggressiveness tending toward domination and imperiousness.

The anterior lobe controls growth of the skeleton. When this lobe dominates, the individual is generally tall, with large hands and feet and a prominent nose. Giants represent over-activity of the anterior lobe; dwarfs, under-activity of this lobe. Its removal causes death. The extract from the posterior lobe is pituitrin, familiar even to laymen by reason of its use in obstetrics. Both the posterior and anterior lobes play an important role in sexual growth and activity, and the se-

cretions of this double gland produce a distinctly feminine or a distinctly masculine type of body, depending on which of its secretions predominate.

The pineal gland, which as previously noted, is masculine in its regenerative nature, is located in the posterior end of the third ventricle; its feminine polarized opposite, the pituitary gland, is situated at its anterior end. The anterior lobe of the latter originates in the embryo as an outgrowth from the mouth cavity which in the fourth week meets the posterior down-growth from the brain. These two parts then develop together into the adult pituitary gland, but the history of their separate origins remains visible in the gland-cleft which persists in adults. The posterior lobe, it may be added, which had its origin in the brain's down-growth, technically called the *infundibulum*, represents an outgrowth from the sympathetic nervous system and is composed of nerve tissue.

Material science has discovered that the pituitary gland influences activity of the ovaries, the female generative organs, and that it is also concerned with the mysterious processes of puberty. It has been discovered that this gland, like the pineal, appears in the first month of embryonic

development and connects through openings with both the mouth and the spinal cavity. At this stage the ego stores up in the pituitary gland spiritual forces that will later be drawn upon in the further building of its body after birth.

In biblical symbology the pituitary gland is represented variously as, for instance, by Noah's Ark, by the Cherubin hovering above the left side of the Holy of Holies, by the new moon worshipped by the twelve tribes, by the laver of purification in the Temple, and by the blessed Virgin Mary.

THE THYROID GLAND

The thyroid gland is located in the throat and consists of two lobes, one on each side of the thachea, or windpipe. Two of its most basic functions are to aid in the maintenance of mental balance and to assist in the formation of habits. Its removal always causes death, since it is the link connecting spirit and personality, a veritable bridge between the objective and subjective planes. Its reactions are dual, being both physical and spiritual. Its secretions, when sufficient, produce nervous energy and clear, quick perception; when insufficient, dullness, laziness and lack of self-

control. Hyper-thyroid individuals are emotional, irritable, easily upset. They are extremely vivacious, continuous conversationalists; invariably nervous, restless, erratic and unstable, craving excitement and activity, and subject to violent emotional outbursts. When the thyroid becomes tumourously enlarged, the effect is goiter.

The thyroid gland is one of the most important in the glandular chain as it is closely interrelated with all the others; it also helps to control growth of the physical body and is the link between the brain and the organs of generation. Situated as it is, the thyroid has an important function in the development of the larynx as man progresses from his present terrestrial to his future celestial state. The spiritual essence of the thyroid aids in this development.

The processes involved in refining the body are materially helped or hindered by breathing, which blends the powers of the air and the blood. "In breath," declares the late eminent occult scientist, Rudolf Steiner, "man shows whether he is united with the lower demoniac or the higher Christ principle." The gill-like appendage of early humanity has become the intricate "voice-box" of the

present, and it will become a spiritualized new organ or "holy cup" in the future. The thyroid will increase in spiritual power tremendously.

Roy Graham Hoskins, author of *The Tides of Life; the Endocrine Glands and Bodily Adjustment*, says "The thyroid is a regulator of energy in adapting one to his environment." Anton J. Carlson, in *The Machinery of the Body*, adds that the thyroid "is a specific necessity for the development of the reproductive mechanism in males and for the lunar cycles in females." Dr. Carlson refers here only to the physical aspect of the moon cycle. The occult scientist knows that the spiritual effect of the thyroid may be equally powerful, particularly from the time of New to Full Moon.

In advanced individuals the thyroid's spiritual secretion aids in developing the larynx as a center of power wherefrom the spoken word becomes a healing and a blessing. It is the flower that blooms in the throat. The word thyroid is formed of two Greek words: *thyra*, meaning a door, and *oidos*, signifying a likeness. ♀

Involution is the process by which the spirit first descends to dwell in physical form. In so doing it impregnates the physical with the spiritual, thus

giving to the personality the likeness of the higher nature. The words of the Christ sound through the ages: "The shepherd (the ego) that enters by the door (the celestial archetype) is the shepherd of the sheep (the body atoms)."

THE PARATHYROIDS

There are four small glands closely associated with the thyroid. These minute bodies are approximately the size of wheat grains and are situated in the epithelium of the anembryonic bronchial cleft. They are paired, two on each side of the thyroid.

The parathyroids have close relationship to the nerves. A deficiency in their secretion causes paralysis and affects the muscular control of the face. Their removal causes death, usually in from twelve to forty-eight hours.

In the processes of regeneration as related to the reconstruction and perfecting of the two nervous systems of the body, these four minute glands will play an important role in establishing complete polarity. It is under conditions of perfect polarity that the Initiate body is built. Such a

body is so charged with the emanations of spirit that it possesses a lightness and buoyancy which make it almost superphysical; at the same time it possesses an inner strength and resilience which lift it beyond the devastating ravages of disease and dissolution. When the full power of these small glands is released the body will become in very truth the temple not made with hands, but eternal in the heavens.

THE THYMUS

The thymus, a pinkish gland, is located in the upper part of the chest. It lies between the two pleural sacs, in front of and above the heart, and back of the sternum. The thymus is not an enduring organ. It attains its greatest size and activity during prenatal development and begins to atrophy about the second year after birth, disappearing entirely at puberty. A substance composed largely of the mother's blood is stored in this gland during the prenatal life of the child and becomes a source of nourishment to the embryo. The vital ethers in the mother's milk sustain this gland, but when the child is weaned the gland begins to dissolve into lymphatic and fatty tissue.

The mother who nurses her child has a closer tie with it and, therefore, a greater influence over it than one who does not, because the vital ethers from her milk are circulated in the bloodstream of the child.

A child cannot form its own red blood corpuscles in the marrow bones until its desire body is born at puberty, so until that time it is dependent upon the substance furnished by its parent and stored in the thymus gland during intrauterine life for the manufacture of its red blood. The thymus is, therefore, the gland of childhood. With rare exceptions, by the age of twenty-one only vestiges of its characteristic tissue remain to indicate the place where it once was.

The thymus not only regulates the child's bodily growth but has some influence on its mental development as well—as shown by an investigation of four hundred idiot children which revealed that seventy-five per cent had no thymus, although the thyroid was present in a normal condition.

The thymus gland secretes a substance necessary for the hardening of eggshell. When it is removed in pigeons their eggs are laid without shells; but when they are fed thymus extract the eggs become

normal again. If a hen's eggs are too soft-shelled, these also become normal if thymus extract is added to the fowl's diet.

A phase of thymus activity was finished when man and mammal began to incubate eggs within their own bodies.

THE SPLEEN

"The spleen is the foetus incubator for the red blood cells and after birth becomes the incinerator for the red blood cells," writes Professor Dorsep, former Associate Professor of Anthropology at the University of Chicago.

The spleen is the largest ductless gland in the body. It lies between the stomach and diaphragm. Its duties are numerous and important, including the manufacture of red and white blood corpuscles, the storing of iron in the blood, and as an aid to digestion. It has a potent effect upon the nervous system, both directly and indirectly because this gland is, perhaps, the principal link between the physical body and the etheric double. The spleen controls certain nerve essences (vital sugar fluid). This gland's etheric counterpart is the gateway for

solar ethers which energize the nervous system, and without which the nerves could not function. The solar forces pass directly through the spleen to the solar plexus and are thence distributed throughout the body, being visible to clairvoyant vision as lines of force which carry impurities out of the body. The spleen is the great Sun station of the body. It differs from certain other important glands in that its removal is not of serious consequence, the etheric organ continuing to function as usual due to its powerful organization.

THE ADRENALS

The adrenals, or suparenals, receive their name from their position just above the kidneys. They are the size and shape of a large bean. The removal of one produces no noticeable result, but the removal of both is always fatal within a few hours. In the human embryo each adrenal begins as two organs which later unite into one with two parts, an outside cortex or bark and a medulla or core. The cortex arises from the middle germ layer and is derived from the Wolffian body. The medulla is part of the outer germ layer and is derived from the same tissue as the autonomic nervous system.

Their importance is second only to the brain and no other organs in the body are so well supplied with blood. The cortex is masculine; the medulla, feminine.

The secretions of the cortex aid in the development of masculine characteristics such as courage and aggressiveness; the medulla favors the feminine traits of gentleness, affection and the power of healing. The latter's influence throws "oil on troubled waters" by allaying anger and soothing frayed nerves. The ancients associated these minute glands with the kidneys, organs which they held in high reverence. When animals were offered in sacrifice, the kidneys were removed with appropriate ceremony and within the sacred precincts of the Temple.

The adrenal cortex correlates with the masculine or voluntary nervous system, and bears a close relationship to the cerebrum or masculine brain.

Adrenalin, the hormone of the medulla, was the first endocrine secretion to be isolated. Its principal constituent is the same as a gland secretion found in the skin of a toad. An early Chinese toad-skin preparation was a well-known remedy for dropsy and heart trouble. This hormone is a

powerful heart stimulant and was so used in Europe until 1775, when it was supplanted by digitalis.

Adrenalin exerts influence upon all smooth muscles energized by fibers of the autonomic nervous system. This places a large responsibility upon it, and great is its influence on human destiny. Physical science has now raised the question as to whether the adrenal glands are a "brain" which takes charge when man is confronted with an emergency that threatens his well-being.

Adrenalin "sets one up"—speeds the heartbeat; draws blood from the spleen, kidneys and intestines, thus reducing their size; sends blood to brain and lungs; orders the liver to give the blood more sugar (energy); makes blood coagulate more rapidly, thus lessening the danger of excessive bleeding from injuries. It wins battles and makes heroes. Its lack, contrariwise, produces fear and a tendency toward cowardliness.

Generally speaking, therefore, we may say that the adrenals are energy glands. When functioning normally they produce both physical and mental strength and alertness. These glands are a curious re-echoing of the masculine-feminine capacities of

the spirit. In certain disturbances of the adrenals a person of one sex will manifest the habits and characteristics of the other. These marked changes can usually be traced to a prenatal state in which the original rhythm of the archetype was changed. If this disturbance occurs after puberty it will reverse sex characteristics. Such are negative or in-harmonious reactions.

As the race evolves it will develop equally within each individual the dual masculine and feminine qualities. The adrenals will then function in a positive and constructive manner only, becoming active agents in establishing perfect equalization or polarity.

THE GONADS

The gonads are the sex glands of men and women. Their influence upon the physical, desire and mental bodies has been studied and tabulated throughout the ages. Yet physiologists know comparatively little concerning their functions. These glands are located in the sacral (sacred) region of the body near the base of the spinal column. They contain an oily secretion from the blood and are the seat of the generative processes

in the body. It has been discovered that they are the center of the disease called prostatitis. In degeneration, the gonad's solution becomes diseased and malodorous; in normal generative life it is a clear fluid, more or less volatile; in regenerative processes, as the blood becomes purified and more gaseous, the "oil" becomes "mercurial"—alchemically fixed, as the Ancient Wisdom describes it—and capable of infinite transformations and multiplications. Under its benign influence the body may become the white manna from heaven.

Gonad is a Greek word for *seed*, a term used for both testes and ovaries. The gonads are not necessary to life, but they are necessary for the continuation of the race or species. They secrete a hormone which supplies the impulse back of sex behaviour.

Adult female gonads contain ova in various stages of development. The ova or germ cells develop in the Graafian follicles. When ripe an ovum bursts through the wall of the ovary and escapes. The ruptured follicle reassembles and enlarges for seven days, filling the rent in the ovarian wall; then it breaks up and is absorbed before the next ovum matures. If the ovum is fertilized, the

follicle continues to develop for three months and persists until the end of pregnancy. The ruptured and changing follicle is called *corpus luteum* (yellow body) on account of its color after the escape of the ovum. The hormone of the ovary has been called an "extract of the contents of the Graafian follicle."

Removal or atrophy of female gonads arrests the expression of secondary sexual characteristics.

Male gonads contain spermatazoa. These develop into germ cells and fertilize the ovum. Absence or atrophy of male gonads produce certain changes in the larynx and skeleton, and checks the development of the reproductive mechanism. It also results in an enlargement of the adrenal cortex and the pituitary gland, diminishes thyroid growth and checks thymus development. Removal of the gonads in either sex produces certain endocrine gland changes.

The practice of transplanting monkey glands to a human body is a travesty on the highest and noblest impulses of nature, and nature sees to it that her laws remain inviolate. Science recognizes that germ cells do not survive transplanting. It is known that the gonad lives only a short time

afterwards. Most of the cells die in a few hours. Those surviving can at best produce only temporary restoration. True rejuvenation must be a spiritual process, lifted high above mere bodily functions. Dr. Carlson, previously quoted, says rejuvenation by gland grafts is a biological fantasy and a catering to sexual degeneracy; he adds that if "the transplant be from goat or monkey, the surgeon is the monkey and the patient is the goat."

The gonads normally function as endocrine glands; consequently, the two sexes differ in structure and behaviour. Specialization in bodies is older than civilization. Sir Arthur Keith, the English scientist, says, "No legislation can blot out structural differences which have taken geological epochs to produce." However, substitution of gonads does effect such changes. An instance is on record of two female birds that displayed all the natural instincts of the female, laid eggs and mothered young. The female organs were destroyed by tuberculosis and were then replaced with male organs, which was followed by male behaviour. Sex characteristics depend on sexual hormones and sex-transformation in adults is possible.

In the light of the foregoing the following

statement is interesting physiologically and psychologically: "Between the two beings so complex and so diverse as man and woman, the whole of life" (he might well have added the entire cycle of earth lives) "is not too long for them to know one another well and to learn to love one another worthily."

The endocrines are so new to science that but little has been verified relative to their mutual interdependency. Dr. Carlson has verified this much: "Gonads cannot function if thyroid, and possibly pituitary and adrenal cortex, are subnormal. Removal of thyroid and probably gonads stimulates the pituitary; thyroid extract appears to stimulate adrenals and pituitary; also heart, liver and kidneys; removal of the thyroid stimulates the parathyroids and removal of the gonads retards the atrophy of the thymus and tends to produce changes in the pituitary and adrenal cortex."

It is said further that the removal of the thyroid is followed by cretinism in children, a congenital condition characterized by stunted physical development and sometimes deformity. In adults the removal of the gland causes myxedema, a roughness or scaliness of the skin. Removal of the parathy-

roids results in death, as does also the removal of the pancreas and the adrenals. Loss of the pituitary gland brings on infantilism in children and impotence in adults. Removal of the thymus is followed by sexual precocity; of gonads, by sex infantilism in children and atrophy of the secondary sexual characteristics in adults. About the removal of the pineal gland nothing yet is known, but esoterically it would tend to render more difficult the acquisition of higher mental faculties and positive clairvoyance. The negative clairvoyant would not be affected to any great degree.

Most of each endocrine may be removed from animals without apparent loss in function of its internal secretion. The scientific inference is that no endocrine normally works to its full capacity in an animal body. This is because their bodies are not yet closely enough attuned to spiritual rhythms of the inner worlds.

The anatomy of the endocrines is almost an untouched field, although they are known to shape the body features, hair, stature; to determine racial characteristics, personality, intellectual and moral leanings. We must look to the endocrines for an answer to puzzling problems in connection with all these.

Arrested development of these glands, or their over-stimulation, brings such abnormal conditions as overweight, underweight, cretinism, idiocy, mental disorders, sexual malformations and general rundown conditions of the body. Consequently, the medical world turns more and more often to these sphinx-like centers of power for solutions to physical problems.

The following glands fall into three categories: The pineal and pituitary glands have to do with the spirit; the thyroid gland serves as the link between the spirit and personality; and the two adrenals, spleen and thymus glands relate most closely to the personality.

Intensive study of the glands and their far-reaching effects in human life tends to develop a more sympathetic and tolerant attitude toward the idiosyncracies of others, since these are often induced by conditions that are not easily remedied—sometimes having their roots in lives antedating the present incarnation and, therefore, requiring changes that may extend considerably beyond the immediate present.

PSYCHOLOGY AND THE DUCTLESS GLANDS

A new concept that higher forms of life are being

governed by a "glandocracy," with the glands of internal secretion as supreme rulers exerting absolute control over an individual's functions from conception to death, and also over the relations of men and women and other vertebrate animals to each other, is presented by Dr. Charles R. Stockard, Professor of Anatomy in the Medical College of Cornell University. We quote:

In this glandocracy, according to the new concept, chemical messengers, or hormones, are sent out by the various glands to distant parts of the body by means of the bloodstream to keep the body going as a functioning, integrated whole, biologically as well as psychologically.

These chemical glandocrats determine not only the purely physiological functions of the organism but also have the first and last word in the makeup of the personality, in the relationship between the sexes and between small and large groups of individuals.

"Recent experiments show," Dr. Stockard said, "that even such emotions as mother love, with its supreme significance to the preservation of species, is dependent on the action of one of these 'glandocrats,' a chemical messenger known as prolactin, sent out by the pituitary gland located at the base of the skull.

"A virgin rat completely oblivious to the

presence of young rats and with no reaction to mother them," Dr. Stockard pointed out, "will become entirely different in her instinctive reactions after a few injections of prolactin. After such injections she eagerly adopts and mothers as many young as may be placed with her."

Dr. Stockard did not indulge in speculation. Some of the scientists present, however, jocularly remarked that this "glandocrat," prolactin, originally discovered by Dr. Oscar Riddle of the Carnegie Institution of Washington, may harbor the secret of international peace and amity between men and nations.

"If a way could only be found," a scientist was overhead to remark, "to persuade some of the apostles of hate now in high positions to submit to a few injections of prolactin we may bring about peace on earth and good-will toward men by Christmas. The millennium may yet be brought about by chemical means."

From his extensive experiments in studying different constitutional types. Professor Stockard presented a new concept of the relations of the glands of internal secretion, or endocrine glands, to the nervous system. "The experiments" he said, "show the glands' great general importance to society as influencing the instinctive behaviour of man.

"From a survey of their activities," he added, "it is realized that the endocrine glands occupy

the position of high command in coordinating the functions and behaviours of all our bodily organs and tissues. They influence in a most profound way our instinctive nervous reactions. They bring about that harmonious balance which we think of as the joy and vigor of perfect health, and they are an important part of the material basis for human temperament and the temperamental foundations of personality.

“Very gradual shifts in influence among the members of this high command are responsible for the constitutional and personality changes during the different periods of our lives, and more pronounced disagreements and violent disruptions among the members of this glandular oligarchy, metabolism and nervous and mental functions.

“The nervous system and the endocrine system,” Dr. Stockard explained, “are the two mechanisms that integrate the parts and functions of the bodies of man and higher animals into an harmonious whole. Moreover, the influences of the nervous and endocrine systems reach out beyond the single individual to integrate behaviours between the sexes and among the different life periods in perpetuating the vast social scale.”

The effects of the ductless glands is new to material science, it is true, but their activities in the

development of the race have long been known to occult science. During the course of vast evolutionary epochs the activity of specific sets of glands changed the entire anatomical and physiological structure of evolving life, together with its environmental habitudes.

Material science agrees now with occultism that children are born with certain glands active which determine their physical growth and their emotional reaction to life; also, that at certain definite ages specific glands are stimulated into renewed activity. It is always the dominant gland that controls the personality.

Louis Berman, the late eminent endocrinologist, in chapters dealing with *Glandular Dominance of Maturity*, lists five general types:

Pituitary: Sufficient: Large bony frame, clear thinkers, creators, ideal masculine type.

Pituitary: Insufficient: Small delicate skeleton, weak muscles, mentally sluggish, lacking in stamina.

Thyroid: Sufficient: Excess energy, rapid perception, magnetic, perpetual workers.

Thyroid: Insufficient: Lack of self-control, tired, dull, lazy and retarded.

Thymus: Sufficient: Angel-child type, graceful,

beautiful, alert, but not fitted for life's conflicts.

Thymus: Insufficient: In infancy leads to precocity, both physical and mental, with early maturity.

Adrenal: Sufficient: vigor, energy, efficient worker, great internal driving power.

Adrenal: Insufficient: Physical and mental bankruptcy, neurasthenia or nervous prostration.

Gonad: Sufficient: High voice, light-hearted, emotional.

Gonad: Insufficient: Special mental and medical problems.

The pineal is not listed as its work is largely with the psychic and spiritual natures of man. The work of this gland will receive lengthy tabulation when man has evolved a purely spiritual system of psychology. Material science, however, has learned that the pineal does retard reproductive gland activity and, conversely, the gonads have a tendency to obstruct the pineal.

Dr. Lazell writes most interestingly in his *Anatomy of Emotion* that the "God-given life of protoplasm is destined for a higher expression than mere animal existence. Spiritualism begins undoubtedly in the emotions," he declares. "The

lifting from instinctive emotionalism into spiritualization produces certain effects through or by the glands, whose secretions, or hormones, are poured directly into the blood. These hormones are chemical messengers which continually change the reaction of the nervous tissue, especially the sympathetic, and also the reactions of the muscles which it supplies. In order to carry out this dual action, these glands are arranged in pairs and their secretions have opposing effects. Without them nervous tissue could only act instinctively and there could be no element of choice between the two sets of impulses."

The modern concept of physiology and psychology are that the secretions of some, if not all, of these glands are controlled by the emotions. Dr. Ivo Geikie Cobb, author of *Glands of Destiny*, and other authorities on the subject state that most men and women who have controlled history were, in turn, controlled by their own endocrine glands, "those little things ranging in size from a grain of wheat to a chestnut." A notable illustration of the power of the endocrines to change the course of a life is found in the case of Napoleon.

Again quoting:

Napoleon would not have lost the battle of

Waterloo if his pituitary gland had not become defective, preventing the great military genius from making those quick decisions for which he was famous.

Napoleon had a superior brain, capable of inventing new military strategy, but what made him master of Europe was a powerful set of endocrine glands. Had these been only average he would have been a valuable adviser to some aggressive personality who would have used and taken credit for Bonaparte's ideas. The glands boss the rest of the body but it seems that the thyroid is a sort of boss of the others, or at least, like a coxswain, it sets the stroke for the others. Also they act and react on each other.

In Napoleon's system there was a weak sister in the gland chain and though it might have done well enough for an ordinary slow-living mortal it finally broke down under the terrific strain of his life. This was the pituitary gland situated at the base of the brain whose job it was to control the growth of the bones. That it was not over-vigorous in youth is indicated by the Corsican's short stature. When his historic career began, it had to work overtime as shown by the instantaneous decisions Napoleon was perpetually making and which is another function made possible by the pituitary.

When the conqueror of Europe made the bad decision to invade Russia, probably that gland

was already beginning to falter. The laggard gland had fallen still further behind during the exile at Elba. By that time the world had learned most of his military tricks, and now he could invent nothing new as proved by the big test at Waterloo. He not only failed to handle this decisive battle with his old brilliance but is said to have actually fallen asleep for a while in the midst of it.

These things would lead the modern endocrinologist to suspect pituitary deficiency, but the autopsy, performed after his death at St. Helena, proved that this was an actual fact, though the surgeons of that time knew nothing of what the endocrines meant.

VITAMINS AND ENDOCRINES

There has been discovered a direct relationship between peculiarities of the personality and deficiency of vitamins. These, in turn, are being correlated with endocrine functions.

THYMUS REQUIRES VITAMIN B

Size and influence of thymus wanes with puberty and adolescence. It is closely related to nutrition and growth. A storage organ, it protects the body against debilitation from loss of food. The thymus has been termed the "barometer of nutrition."

It becomes *smaller and may completely atrophy* due to excessive malnutrition. Vitamin B restores the thymus to normal functioning.

ADRENALS, GLANDS OF COMBAT REQUIRE VITAMIN B AND C

Each gland is double; the outer or cortex produces internal secretion and intercortin; the inner portion or medulla produces adrenalin. Intercortin and adrenalin are inventions for massing all the strength of muscles and blood for meeting an emergency. Internal secretion of the cortex controls brain growth and development of sex glands. The removal of the adrenals, as said before, means certain death in a few days, thus indicating some function pertaining to the continuance of life. Malnutrition produces enlargement of the adrenals. By deficiency of Vitamin C they become twice their natural size and weight. Deficiency of Vitamin A *increases* the amount of adrenalin. Deficiency of Vitamin B *decreases* the amount of adrenalin.

PARATHYROID GLANDS REQUIRE VITAMIN D

These four minute glands lie in such close proximity to the thyroid that they were for a long time

considered to be part of it. They are the regulators of the calcium intake of the body. These glands are not present in fish as there is so much lime in the sea that fish do not need a regulator. Fish manufacture Vitamin D in the liver. Parathyroids are, however, present in all land animals to conserve and regulate the calcium supply. They enlarge in calcium deficiency as the thyroid enlarges in iodine deficiency. When there is a life deficiency in the food the blood extracts it from the bones to fill its lack. Vitamin D foods facilitate assimilation of calcium by bones and relieve the strain on the parathyroids. Parathyroid deficiency causes extreme sensitivity of the nervous system. The parathyroids and calcium metabolism have a definite relation to a neurotic constitution.

Calcium foods are milk, cheese, carrots, turnips, oranges, prunes, beets and apples. Vitamin D foods are egg yolk, cod-liver oil, liver, fish fat and foods treated with ultra-violet light.

REPRODUCTIVE GLANDS: THE TESTES AND OVARIES REQUIRE VITAMINS A, B, C

Vitamins A and B give off radiations similar to X-ray and radium. These rays produce powerful effects upon living matter, being channels for inner-

plane forces. Deficiency of A produces interference with the ovarian hormone that regulates the rhythm of feminine sexual cycles. When these rhythms are upset they become irregular, hence inharmonious, causing a reduction of fertility. Deficiency of Vitamin B produces general degenerative atrophy of the ovaries. Vitamin C is necessary to ovarian nutrition. A, B, C, are the building stones for formation of healthy ova. Vitamin E is especially related to the uterus and reproduction. Deficiency of E in the male results in marked disturbance in sperm production, pronounced deficiency resulting in sterility.

PITUITARY GLAND REQUIRES VITAMINS B AND E

The pituitary is the gland of many hormones and functions. It controls growth in childhood and adolescence, sexual development and sexual metabolism. It is necessary for proper evolution of the reproductive glands. The post-pituitary regulates the water balance of the body, blood pressure, gastro-intestinal tract, and influences the fatty and sugar metabolism. It also determines the pigmentation of the skin. There is more Vitamin E found in the pituitary than in any other

gland. A deficiency of Vitamin B castrates it physiologically and psychologically. It is as important for the pituitary as is Vitamin E for the testes and placenta.

Normal functioning of the pituitary involves the metabolism of manganese. Manganese foods prevent pituitary strain. These include potatoes, lettuce, agar-agar, wheat germ, liver, peanuts, walnuts and almonds.

Copper foods are necessary to the blood. Oats, almonds, kidney beans, peas, asparagus, corn, lentils, and barley are among the highest in copper.

THYROID GLAND

Iodine, the key substance in the thyroid gland, is the controller of vitality and growth; also the protector against injuries and intoxicants. It secretes thyroxin and needs a continuous supply of iodine foods which are found principally in sea products.

ASTROLOGICAL CORRELATIONS WITH THE DUCTLESS GLANDS

As there is a zodiac in heaven, so there is a zodiac in man; as there is a firmament in heaven, so a

firmament in the body. Heaven operates in us.

—Paracelsus.

The ductless glands occupy certain important and sensitive points in the body. Their origin may be traced to the early beginnings of the evolution of man. There have been periods when they functioned actively, and others when they remained dormant. In future races they will possess a high spiritual power in connection with extended consciousness and the awakened faculties of the Initiate.

The ductless glands have been aptly referred to by one knowing their spiritual significance as "interior stars," for the reason that they are correlated with the planets of our solar system. As a constellation of interior stars, the glands may be styled the Pleiades of the microcosm.

The Sun and Neptune rule the pineal gland; Uranus and the Moon rule the pituitary body; Jupiter, the adrenals; Mars, the gonads; Mercury, the thyroid; Venus, the thymus; the Sun, the spleen. The parathyroids respond to both Mercury and Neptune.

It will be noted that the highest spiritual planets, Neptune and Uranus, exert their influence through the spiritual head centers, the pineal and pituitary.

Mercury, the messenger between gods and men, operates through the thyroid, the center which connects the personality with the spirit. Previous reference has been made to the thyroid as the passageway between the higher and lower natures of man.

As Paracelsus has stated, "Heaven operates in us. Each star in our solar system has a special influence over an interior star."

The seven principal ductless gland are the Seven Spirits before the throne of the indwelling God. When illumined and awakened to the spirit's bidding, man is lifted above the sphere of mortality and functions at will among the "redeemed."

The pancreas is a long, flat gland behind the liver and to the right of the spleen. It produces both an internal and external secretion. The internal, which controls the amount of sugar in the liver, is termed insulin; the extract which acts upon the starches in the intestines is the pancreatic juice. Excessive sugar taken in the body produces too much strain upon the insulin supply of the pancreas and oftentimes diabetes is the result.

The pancreas, together with the liver, is under the rulership of Jupiter.

There is a close and harmonious relationship be-

tween the secretions of the pancreas and the adrenals, the latter also coming under the expansive rays of Jupiter. An affliction from Jupiter restricts this interaction, with untoward effects upon both the physical and emotional natures.

The stimulating and molding forces of the great starry Hierarchies are active in every phase of human development on all planes of being.

The powers of Aries-Libra, focusing through the pineal center, accelerate the purification of desire and its transmutation, which then tend to awaken the effulgence of the pineal gland or third eye, the principal spiritualized organ of the head.

The pituitary controls the growth and form of the skeleton. The forces of Taurus-Scorpio lay the foundation of this work, Taurus bearing the celestial pattern and Scorpio (the Lords of Form) reproducing that pattern in material form.

The Lords of Gemini and Sagittarius center the dual powers of polarity through Mercury upon the thyroid and the parathyroid glands.

The thymus is the gland of mother-love and sustenance. It is here that the spiritual forces of Cancer-Capricorn concentrate. The sustaining and protecting powers of Cancer are encircled by the hardening and restricting forces of Capricorn.

Thus the outer shell is formed to protect the interior Cancer force which is developing within.

The Lords of Leo, the Hierarchy of Spiritual Fire, and of Aquarius, the Lords of Spiritual Air, infuse the etheric spleen with their vibrant life. Under Aquarius new Sun rhythms will be contacted which will extend incredibly the present life span.

The gonads respond to Virgo-Pisces in higher life and to Taurus-Scorpio in lower. The masses respond to the lower sense impulses of Scorpio and Taurus; the regenerate, to the purity of Virgo and the chaste Neptunian ray of Pisces. The gonadic force must be lifted to unite with the pineal gland and pituitary body in the intricate processes of the Mystic Marriage.

The adrenals, the glands of body balance, responded in their early inception to Libra-Aries. In the spiritual transmutation of the body, secretions generated by the emotions must become the equilibrating, harmonizing forces of new regenerate life. The old Adam man must become the new or resurrected Christed Man.

THE DUCTLESS GLANDS AND THEIR PART IN THE MYSTIC MARRIAGE

The seven most important centers of the gang-

lionic system are represented in John's Revelation by the seven churches. The physical body is a crystallization of the inner or invisible bodies, and the ductless glands are the special centers or channels through which higher spiritual forces must pass into the dense vehicles. As previously noted, the four glands located in the trunk of the body are the expressions of the personality; the two in the head are expressions of the spirit; the thyroid in the throat is the bridge between the group below and the pair above. In this connection it is to be remembered that the mysterious control exercised by the ductless glands on the body, character and behavior of man comes in turn under the control of the soul and its yet higher counterpart, the indwelling spirit of God.

The regenerative processes through which the personality of man must pass are described in Revelation in the messages to the seven churches. The same work is given in the Seven-Ray Formula of the Mystic Marriage ascribed to the founder of the Brotherhood of the Rosy Cross, who bore the symbolical name of Frater CRC. As man progresses spiritually the ductless glands will become a most important study for illumined anatomists. They are veritable shining mileposts marking the

path to human regeneration. "What I say unto the churches, I say unto all, Watch!"

The endocrine glands are the "open sesame" to hitherto locked gates leading into unexplored fields of God's great domain of Life and its wonder working in man's bodies, visible and invisible. Only as one's mind broadens and his five limited senses begin to comprehend something of the wonders of Spirit and its composite projection—the multiple interpenetrating bodies of man—can one understand the full significance of Paul's words when he said: "Eye hath not seen and ear hath not heard the wonders which God hath prepared for them that love Him."

The pineal gland contains a fluid or life essence which, in the process of regeneration, becomes a living light, illuminating the body from within so there is no necessity for the outer light of Moon and stars, as St. John states in Revelation. In the death processes this pineal fluid crystallizes into a sand-like substance familiar to material science. Its investigations being confined to the domain of the tangible world, it does not accept occult findings in regard to the higher phase of pineal activity.

The biblical parable of the house built upon sands, which the waves may destroy, applies physi-

ologically to the pineal gland of average man who lives an ordinary sensual, materialistically limited life. When, through spiritual culture, the pineal essence is transformed into a living light substance, it is like unto the house founded upon rock, which neither wind nor wave has power to shake from its foundation.

As the seven glandular centers of power in the body of man are awakened by pure and holy living, they become luminous by reason of a spiritual current which passes through the body and augments the spiritual life force as it is lifted to the head.

It is in this process of overcoming, so frequently alluded to in Revelation, that the sleeping serpentine fire within the spinal canal is awakened and begins its ascent to the head as a stream of golden light. The serpentine fire is as subtle as the serpent from which it takes its name, changing in color and increasing in luminosity as spirituality unfolds. It is tinged with an ethereal ray of blue, pink or green, in accordance with the characteristic note of the aspirant's temperament. Where the development is primarily through the mentality, the ray is blue; through the heart, pink; through service, green. Only a small portion of this spirit

essence passes into the fourth ventricle in the head where it becomes yet more ethereal, a heavenly manna, the mystic bread served at the marriage feast. There the bride and groom are the pineal and pituitary organs, and the third ventricle is the bridal chamber or Hall of Initiation where the new Christed consciousness is later born.

The golden glory which floods the third ventricle gradually overflows and encircles the head, and eventually the entire body, with the luminous halo or aura of the Saint or Initiate who "walks in the light." When this light has been attained by humanity, we shall all know fellowship, one with another.

From certain glands concerned with generation is secreted a small amount of oil. As emotions become purer, this oil tends to increase, both in potency and volume. Then the atomic vibratory rate of the entire human organism is lifted and mental poise is achieved. Gradually, poverty and lack on all planes disappear, along with their familiar attendants, fear and selfishness.

This secretion is the "fixed oil" of the alchemists. It has been known by many names in various Schools down through the ages. It is the great

transformer on all planes of being, yet its effect is always the same. The body is the land and in regeneration this oily substance becomes its means of illumination.

The Foolish Virgins of the Bible represent those who live in so unwise a manner that this oil is wasted and is, therefore, unavailable for regenerative purposes. Hence they are unfortunately "asleep" when the Bridegroom comes, unaware that the doors to the marriage feast have been unbarred.

The Wise Virgins are those who live so that this oil is conserved and becomes luminous. They keep their lamps trimmed and burning. Thus they are prepared to meet the Bridegroom and with Him to enter joyfully the sacred precincts of spirit, there to partake of the royal marriage feast.

OCCULT ANATOMY SERIES

- 1 The Immaculate Conception
- 2 The Archetype, or The Heavenly Pattern of Man
- 3 Prenatal Adventures of the Human Spirit
- 4 Physiological Processes Spiritually Interpreted
- 5 Ye Are the Temple of the Living God
- 6 Two Nervous Systems and Their Relationship in Spiritual Development
- 7 The Etheric Body and Its Role in the Spiritual Development
- 8 The Blood — An Arcane Mystery
- 9 The Role of the Ductless Glands in Spiritual Development
- 10 The Desire Body — The Astral Plane, Karma, Conscience
- 11 Body, Mind and Spirit
- 12 Rebirth Through Regeneration



OTHER WORKS BY THE SAME AUTHOR

OLD TESTAMENT VOL. I

The Five Books of Moses and Joshua

OLD TESTAMENT VOL. II

Part I—Solomon and the Temple Builders

Part II—Books of Initiation

OLD TESTAMENT VOL. III

Part I—The Promise. Part II—The Preparation

NEW TESTAMENT VOL. IV, V and VI

THE MYSTERY OF THE CHRISTOS

HEALING MIRACLES OF CHRIST JESUS

THE HOLY CHRISTMAS MYSTERIES

THE HOLY EASTER MYSTERIES

BIBLE AND THE STARS

NUMBERS AND THE BIBLE

MYTHOLOGY AND THE BIBLE

THE MYSTERIES OF THE HOLY GRAIL

ESOTERIC MUSIC—Based on the Musical Seership of Richard Wagner

BEETHOVEN'S NINE SYMPHONIES IN

RELATION TO THE NINE SPIRITUAL MYSTERIES

HEALING AND DISEASE—In the Light of Rebirth and the Stars

HEALING AND REGENERATION THROUGH MUSIC

HEALING AND REGENERATION THROUGH COLOR

THROUGH THE YEAR WITH MARY

THE SUPREME INITIATIONS OF THE BLESSED VIRGIN

MYSTIC MASONRY AND THE BIBLE

OCCULT ANATOMY AND THE BIBLE

THE ARCHETYPE, OR THE HEAVENLY PATTERN OF MAN

THE IMMACULATE CONCEPTION

PRENATAL ADVENTURES OF THE HUMAN SPIRIT

PHYSIOLOGICAL PROCESSES SPIRITUALLY INTERPRETED

YE ARE THE TEMPLE OF THE LIVING GOD

THE ETHERIC BODY—and its Role in the Sensitization of the Physical

TWO NERVOUS SYSTEMS—and Their Relation in Spiritual Development

THE BLOOD—An Arcane Mystery

THE ROLE OF THE DUCTLESS GLANDS IN SPIRITUAL DEVELOPMENT

THE DESIRE BODY—The Astral Plane, Karma, Conscience

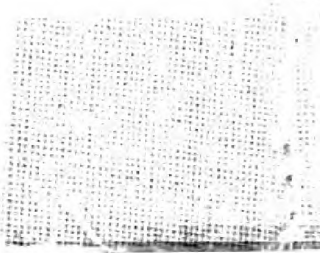
BODY, MIND AND SPIRIT

NEW BIRTH THROUGH REGENERATION

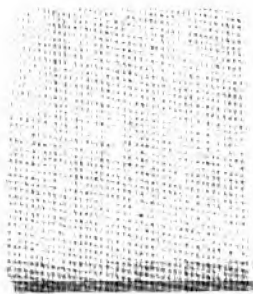
NEW AGE PRESS, INC.

**1544 Cerro Gordo St.
Los Angeles, Calif. 90026**

**P. O. Box 423
Santa Monica, Calif. 90406**



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100





UNIVERSITY OF ILLINOIS-URBANA



3 0112 070684458