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## STRESS AND THE ADAPTATION SYNDROME

MARLIN HEILMAN, M.D.

There is a large variety of means whereby man's mind and body carry out their uses. A number of them are under some conscious direction, as is the flow of thought into speech. Others are more fully automatic, such as happens with the co-ordination of sight, hearing and general muscular activity when driving a car. It is noteworthy that the human organism tends to use all the means it has for carrying out its uses as economically as possible; thus consciously learned functions tend to become habitual so as to free more energy for consciously dictated functions. For the sake of being useful, man's mind needs to be as free as possible of those functions which are routine in the protection and maintenance of the whole organism. Central Nervous System centers automatically direct the program of protection and maintenance by activating and inactivating various bodily systems. Except for the process of filling the stomach, for example, digestion automatically takes place through Central Nervous System control. Similarly ordered is blood circulation, and the distribution of the products of digestion to where they are needed.

Some of these complicated functions have been well known for many years, others have been worked out more recently, viz.:

Blood circulation, as discovered by William Harvey (1578-1657). Circulation of our blood distributes oxygen and nutrition to every cell in our body and removes  $\text{CO}_2$  and effete matters.

The role of oxygen and  $\text{CO}_2$  interchange in the lungs was explained to us by Lavoisier (1743-94).

Our understanding of the part played by our digestive system in refining food and furnishing nutrition to our bodies was chiefly the work of R. de Reaumur (1683-1757).

The knowledge of the immune mechanism that we share with all other animals was chiefly given to us by Pasteur (1822-95) and Metchnikoff (1909). All trees, vegetation and even the smallest organisms have built-in automatic immune mechanisms for the production of substances which destroy their enemies, as penicillin in the penicillin mould and quinine in the cinchona tree. Many of these immune substances are transferable to man.

We have learned through the work of Sir A. E. Wright (1861-1947), that our immune mechanism can be artificially stimulated to produce an abundance of specific immunity.

Much information has come to us in the past few years about the recording of sense impressions in the cortex of our brains. Not a single sense impression nor the emotional response that it caused is lost. The recordings of sense impressions may or may not be subject to the playback that we know as memory; but Dr. Wilder Penfield has shown that by stimulation of the afferent fibers to memory cells—i.e., fibers going from the center of consciousness in the brain to recording areas of the cortex—by a stream of electrons in his stimulator (1 to 2 volts), these memory cells can be made to parade their contents before our consciousness, whether or not we can voluntarily recall these memories. Stimulation of the cells themselves causes extinction of function, but stimulation of the afferent fibers to the cells causes nerve impulses to be generated in the fibers that arouse memories of sight, hearing, taste, smell and touch that may have long since been forgotten. But a more precise understanding of how the body protects itself from stresses of common and uncommon origin was not crystallized until recently. Dr. Hans Selye is a modern pioneer in the field of endocrinology. He developed by extensive animal experimentation a theory of the nature in which stresses are met, and this theory he called the Adaptation Syndrome.

When you prepare to carry out any use or work, adaptation is necessary. Adrenalin and glucose, for instance, must be rushed to the scene of action in unconscious response to what is needed.

To combat specific infections, antibodies, antitoxins, precipitans, agglutinins and opsonins are formed and thrown into the blood stream; but these are specific reactions and do not come under the Local Adaptation (L.A.) or General Adaptation Syndrome (G.A.S.), which terms are used to designate non-specific uncon-

scious bodily response, in other words, a response to stress regardless of the cause.

Swedenborg describes the pituitary gland as the Arch Gland; i.e., as the archduke is the ruling duke, so the pituitary gland is the ruling gland.

Signals from our brain via nerve impulses, also nerve-ending secretions and through the blood stream, reach the pituitary gland in response to stress demands. The pituitary gland secretes many different types of hormone stimulating substances, some of which have been isolated:

a) Lactogen goes into the blood stream to produce milk from the mother's breasts, being stimulated by sight, sound and touch of the infant.

b) Thyrogenic substance is secreted into the blood stream when we have a job or work to do that demands glucose metabolism and energy maintenance.

c) The parathyroid glands are stimulated from the pituitary to maintain calcium metabolism.

d) The pancreas is stimulated by substances from the pituitary and thyroid, that make the islands of Langerhans, in the pancreas, secrete insulin for glucose metabolism.

e) S.T.H., or somatotrophic hormone, stimulates body and cell growth and cell metabolism.

f) A.C.T.H., or adrenocorticotrophic hormone, stimulates the cortex of the adrenal gland to produce (a.c.) antiprophylogistic and (p.c.) prophylogistic corticoids, which means anti-inflammation substance and inflammation producing substance.

g) Androgenic substance from the pituitary produces from sex organs internal or blood stream sex hormones.

The signs or symptoms of the disease that you may be suffering from are the physical signs and the conscious effects of the (G.A.S.) general adaptation syndrome at work to bring about a cure of your disease, i.e., to get rid of the threat to your life or to maintain the lease on your body that your soul has. The chill helps to bring temperature rise, which is part of the inborn mechanism that calls out the militia or standing army, i.e., the white blood cells, to seal off areas of combat. Inflammation or the localized arenas of defense can be recognized by pain, swelling,

redness and heat in areas around burns, bruises, lacerations, points of entrance of foreign bodies, bacteria, stings or bites, and in other parts of our bodies by abscess formation, consolidation of the lung in pneumonia, etc.

The aches and pains that you suffer are the systemic effects of the inflammation producing substances from the adrenal cortex, and the early disappearance of these aches and pains is the result of contemporaneous production of a slower acting substance called anti-inflammatory hormone, popularly known as cortisone.

The tired feelings from which you suffer simply show you that a great battle is going on, that your stress quota of resistance is being used up; and they make you conscious of this fact, so that you will conserve your energies.

In the performance of your employment, you use up a certain but definite amount of your stress-maintaining ability, i.e., your available metabolism that makes it possible for you to accomplish any task. Dr. Selye likens this to a spendthrift who has a fixed amount of money in his pocketbook that makes it possible for him to carry on; when he has spent this amount he has to stop and go to his inherited bank account to replenish it. When you become tired you must relax, rest, diversify—go to your reserve for replacement of your used-up stress-combatting supply of energy. A wise man will give opportunity after a day's work for replenishment. The extreme of the profligate spendthrift is bankruptcy; the extreme of the foolish man is fatigue, exhaustion, shock, and even death. To illustrate, when glucose, which is the chief energy support, is used up, protein, ordinarily the basic cell-building material, is converted to glucose. In addition to there being this type of loss, it is noteworthy that part of our protein is globulin, which contains our antibodies; and that the loss of this protein fraction makes us liable to infection.

Stress may be defined as our life's activities. Their maintenance is by the subconscious (G.A.S.) general adaptation syndrome. Under good emotions, good heredity and good environmental adaptation, the pendulum of endocrine production between inflammatory and anti-inflammatory corticoid production is kept in balance or is said to be neutral or normal. Bad emotions distort the production of these corticoids and tend to cause the pendulum to go right or left to greater extremes. If, for example, there is an

over production of the (p.c.) inflammatory producing corticoids, we can expect to have a greater proneness to the development of conditions like arthritis, arterio-sclerosis, high blood pressure, heart disease. If there is an over production of (a.c.) anti-inflammatory corticoids (cortisone), then we can expect to suffer from diseases like stomach and duodenal ulcers, lowered resistance to infection, etc. These are diseases of adaptation.

Adaptation involves more than the physical and chemical means whereby the body repairs and restores tissues and protects itself from physical insults. These means maintain the mechanical tools which are needed by the mind to carry out its intentions.

The entire body is governed by the nervous system, which comprises about 20% of the body weight. Fibers of the nervous system run from its centers in the brain to dominate every living cell in the body. As a result, there is central control of or adaptation to every conceivable set of circumstances that life may present. There is an inherent central driving force, seemingly mediated mainly through the nervous system, that seeks to promote and to maintain physical and mental growth of all kinds.

With regard to mental life, it may be seen that as a rule it tends to dominate all physical bodily functions. It uses them to carry out its purposes, so to speak. Thus the so-called adaptive system becomes utilized by the mind to protect from stresses of a mental nature as well as physical ones.

To illustrate, a fear reaction caused by a threatening situation brings a subjective demand for action. The demand sets in motion a series of events in the body. It seems that these are all brought about in order to protect one from the danger perceived. Nerve impulses are sent from brain centers to mobilize all bodily resources necessary. But if the danger as perceived is not a reality, or is exaggerated in mind, then the adjustment effort has been used to excess. Probably everyone has experienced uncomfortable feelings such as pounding heart, pains or cramps in the abdomen, trembling, and so on, under the above circumstances.

When fears or worries become persistent they seem to build up a hidden influence on the adaptive system. Then there is a tendency to keep one or perhaps a number of bodily systems in unnecessary preparedness to meet danger. This is often felt subjectively as some kind of tension. If there is great persistence of these

worries, physical disease may follow; for it seems that the over use of adaptive mechanisms brings about conditions which are not appropriate to the carrying out of usual bodily activities not associated with danger.

To illustrate, danger conditions demand that the main blood volume be made available for thought and muscular activity. Automatic controls shunt it from the digestive system for the duration of the emergency. Under conditions which cause the mind to feel that there is a prolonged emergency, digestion may then be interfered with. In time the person may develop an ulcer, or perhaps some other disease. Seemingly any part of the body can be affected by disease through the over use of the adaptive system.

Physical diseases that have been produced by emotional stresses often are curable. Doctors find a remarkable tendency of the body and mind to become restored to health when proper steps are taken to work out realistic solutions to problems. When the mind is helped into a more favorable state it seems to have a powerful effect upon the bodily derangement. The adaptive system itself, which may have been in part instrumental in the cause of the disease, becomes a means whereby the body or mind is repaired.

The findings of Dr. Hans Selye are of special interest to New Church people because they furnish scientific support to what Swedenborg wrote in *The Soul or Rational Psychology* (214) about the effect of good and evil affections upon the body.

Indeed, these findings afford a basis for a fuller understanding of the teachings of the Writings that evil is the cause of disease (AC 5712); that the cupidities and passions of the lower mind are the origins of disease (AC 5712); that disease is from sin (AC 8364); that diseases come forth from cupidities which vitiate the blood (SD 4592); and that if man (*homo*) had lived a life of good he would be without disease and would merely decline to extreme old age, even until he became again a little child, but a wise one; and when the body could no longer minister to his internal man or spirit, he would pass without disease out of his earthly body into a body such as the angels have, thus out of the world directly into heaven (AC 5726).

In *Reader's Digest*, September 1959, page 66, Dr. Young states: "Our world is evolving from chaos, savagery and imperfection toward some final realization." May not this realization be that

the Lord was the architect of the human body, and that its conception and growth to maturity were directed by the soul through the spiritual world?

The New Church philosophy is that all of these sensory recordings and the ability to use them go with us when we die: all of these marvelous subconscious mechanisms were given to us to make it possible for our souls to sensate in this world and amass experiences and mental growth for use in the world to come. Who would dare deny that the house you live in was the product of a human architect and a skilled builder? Who would say it was the product of environment or adaptation to conditions? It is not conscious nor ambulatory, nor self-repairing. The understanding of the electron and its harnessing for use has made your home to some extent automatic—as witness your washing machine, electric light, electric cooking, etc. All this makes us wonder why some people deny that our bodies were given to us for a purpose, that they had a Divine architect and builder. Our souls, as distinct creations, live in our bodies for three-score and ten or so years. Through these God-given mechanisms discussed here we accumulate what is necessary to make us citizens of another world.

*Bibliography for the above discussion*

I Dr. John A. Schindler, *How to Live Three Hundred Sixty-Five Days a Year*. In this book he presents *empirically*, i.e., from his experience with the many thousands of patients who came to the Monroe Clinic, the somatic or bodily effects of good and bad emotions; shows how good emotions have a tranquilizing effect and how the bad emotions unbalance the adaptation syndrome to produce diseases of adaptation; and shows how correcting chronic bad emotions brings about a cure.

II Dr. Leon Saul in his book *Emotional Maturity* shows from his extensive experience with psychiatric patients in the armies of the last war how important it is to find and correct deeply implanted bad emotion, especially hate, in order to effect a cure for these mentally sick patients.

III Drs. Weiss and English in their text book, *Psychosomatic Medicine*, show *empirically*, i.e., from experience, that many diseases result from deepseated bad emotions.

IV Dr. Rene A. Spritz in her article printed in one of Dr. Selye's annual reports on stress, shows the terrible destructive effects of stress in the first two years of life. Infants who receive no mother-child contact after the first five months have a mortality rate of over 30% and their mental deterioration cannot be corrected (irreversible) if the cause has been present over five months.

V Dr. Hans Selye wrote :

1) The Adaptation Syndrome. 2) Stress. 3) Annual Reports on Stress with 30,000 published articles about stress. Dr. Selye gave us our present understanding of how our bodies adapt themselves to stress, by his fantastic animal experimentation on the endocrine system.

VI Mary E. Gross wrote a romantic and very readable account of Dr. Selye's work called *Living with Stress*.

VII About 1742, Swedenborg wrote in *The Soul or Rational Psychology*, no. 214: "Love is a pleasing affection delighting the sensories, repairing the bloods and animal spirits with new heat, life and light and restoring the single parts of the body." "Hatred is an unpleasant affection which grieves the sensories and disturbs the bloods and animal spirits, depriving them of their better life and destroying the several parts of the body."