The Stress-Response Mechanism

We have all heard the term "stress." It means to be under pressure, to be faced with situations which place strain on our bodies, particularly the nervous system. The concept of stress is very old. Even to prehistoric man it must have occurred that there was something in common between the loss of vigor and the feeling of exhaustion which comes over us after hard labor, prolonged exposure to disease, extreme temperatures and fears. Every unaccustomed task (be it going without food, lifting rocks, swimming in cold water, etc.) occurs in three stages:

1. At first it is a hardship.
2. Then we become accustomed to it.
3. Finally we cannot continue.

But, it was not until about 30 years ago that it was found that stress causes certain changes in the chemical composition of the body. Some of these changes are signs of damage while others are the body's attempt to restore itself to normal—a defense mechanism against the stress itself. Have you ever noticed that the most unrelated diseases produce so many common signs and symptoms? Whether a person suffers from an infection, cancer or heart disease there is a loss of appetite, strength and ambition. One also usually loses weight and even the facial expression will betray the illness.

This is the syndrome of simply "being sick." We can be sick from physical or mental sources, but the reaction pattern of the body is the same.

General Adaptation Syndrome

Research done by Dr. Hans Selye showed that there are basically three types of changes which take place within the body at the point of illness. These changes occur in the following places:

1. Enlargement of the adrenal glands.
2. Shrinkage of thymus.
3. Ulcerations in the upper gut.

This combination of symptoms is known as the G.A.S.—General Adaptation Syndrome.

General because it is produced only by agents that have a general effect on large portions of the body.

Adaptive because it stimulates defense and helps the body get through the hardship.

Syndrome because its signs are coordinated, always appearing together and partly dependent on each other.

This syndrome—pattern of symptoms—comes about through three states:

1. Alarm reaction.
2. Resistance state.

Under ordinary circumstances, our bodies respond to stress immediately—automatically—by going into the first stage of alarm reaction.

This enables the body to draw on its resources in an effort to combat and (hope-
fully) overcome the source of the stress. When this situation occurs and the stressor is overcome the body returns to its normal balance. However, should the stressor not be overcome one of two things can occur. If the stressor is so damaging that continued exposure is incompatible with life then death is caused within a short period of time. However, if survival is possible and the stressor cannot be overcome then the body alters its usual adaptive balance to suit the need. This continuous exposure to a stressful situation without its resolution requires continuous alarm reaction. There is a drive within the body to maintain a balance at all costs. It will compensate for continued imbalance by adaptation within its own system. It is impossible for an organism to exist continuously in a state of alarm.

The second stage of resistance is entered into—again automatically. During this stage the individual may not be aware of depleting adaptation, for changes which occur chemically are often quite the opposite of those occurring during the stage of alarm reaction. Consequently, one may feel the situation has passed and goes about one's business, accepting or ignoring many subtle changes which have occurred. After a prolonged period of time at this high level of adaptation the body pays a price—it loses its resistance and resilience. It cannot continue the adaptation nor can it "bounce back."

**Exhaustion**

The third stage of the syndrome—exhaustion—occurs. It is at this stage that most people seek help, for they can no longer continue. Often, though, by this time permanent damage has been done. The prolonged process and the effects of it will require continued attention in the future if the individual is to lead a "normal life." Obviously, it is extremely important that the individual be "tuned in" to what is happening in order to resolve stresses as quickly and efficiently as possible.

This may sound as though stressful situations should be avoided at all costs. Not so, for stress is nature's way of causing changes to occur—of jarring us out of a rut—of forcing equal usage of potential from all areas. We all should know that tension causes excitement by a chemical process. This excitement prepares us for peak accomplishment and can prove to be extremely beneficial. On the other hand, the jitteriness of being overly "keyed up" can impair work and prevent needed rest, thus leading to negative bodily reactions and adaptations. Obviously, there must be a balance between these systems. We need to be flexible enough to permit excitation, yet controlling enough to regulate its necessity.

Above all, we must have insight into our own individual selves to be aware of what is happening and why it happens in order to deal with it effectively.

To do this requires much more than simply an "expert" to explain generalities. Each one of us is a unique individual. This certainly has its advantages in our individuality, but it also requires that each one of us accept the responsibility for understanding just how our particular selves react to our environments. We must realize that the same stressor has different effects on each one of us. What one can resolve effectively another cannot. What makes this difference between our reactions, our level of stress tolerance?

In part it is genetically determined (sex, age, organ structure); in part a product of our experiences (learned life patterns, diet, drugs). A degree of stress which one person can handle well may be enough to set off a reaction in another. Which leads to breakdown in a weak area. Under continuous stress some of us develop headaches, some stomach aches, some blood sugar problems, others visual difficulties,
etc. The specific symptoms vary from individual to individual, but the source—stress—is always the same. This is the way in which "normal" organisms respond to their environment.

**Metabolic Dysfunction Underlying Response Patterns**

Let us assume that there is an abnormality within the organism itself. Let us suppose that an individual is conceived within whom one (or many) chemical mechanisms are improperly structured. The result is a person whose mechanisms which are intended for use only under stress may either be capable of triggering themselves into a reaction without environmental stimulation; or be capable of interacting with other body systems in a faulty manner so that the individual's overall reaction system may be based on faulty organic processes. It seems obvious that if such a condition exists, no amount of talking (psychotherapy) will alleviate the problems. For these people, there must be a twofold approach from both the physical and emotional levels.

Traditionally, "emotional" disturbances have been viewed as conflicts within the mind of the individual in which an approach oriented toward teaching the person to understand and handle life stresses more efficiently is appropriate and adequate. However, again, our new knowledge in biochemistry shows us that there are certain people who are:

1. Strongly predisposed toward metabolic disorders and for whom minimal stress can cause breakdown of the involved process.

2. Born with this process impaired or non-functioning, thus disturbing their entire life, from conception to death.

These people—again contrary to traditional belief—are physically ill. They have a disease process to which they are responding and compensating for as best they can. Instead of being thought of as "second rate" people who simply couldn't pull themselves together, they should more properly be pictured as handicapped people struggling daily to maintain their existence. Imagine a diabetic without insulin. The insulin acts as the compensatory chemical mechanism which maintains the body's homeostasis. Without this insulin the diabetic would die. No amount of psychotherapy could compensate. In fact, no one would even dream of sending a diabetic to a therapist, at least not until the disease process was controlled medically.

"Mental illness" may, in reality, be just that. A disease process over which the individual can exert little control without medical assistance. If this is so, it is very disturbing to think of the number of people who have suffered throughout their lives the scourge of this disease. Alone, afraid, destroying themselves and others without the proper treatment available to them.

They have been regarded by most therapists as "weak" or "manipulative" or "self-punishing" or "immature." Their families have been blamed for the difficulties. People who deserve these labels surely exist and some of them will suffer from a metabolic dysfunction process and some will not. But to suggest that this is the primary source of the problem in all cases seems ridiculous.

We have found that alterations in diet
as well as additives to the daily intake of vitamins are bringing about astonishing results. We have hypothesized that these people apparently are victims of an inborn metabolic error(s) which, eventually may be clearly identified and (hopefully) eventually be able to be restored to normal functioning.

The most widely known and most profound example of this type of finding is with the syndrome known as PKU (phenylketonuria). In this process, one inborn metabolic error—an inability to metabolize a constituent of proteins—unless treated from birth with a special diet has an irreversible effect on the child—causing severe mental retardation. The original hereditary potentials are dwarfed and never come to fruition.

Within each human being lies the drive to "actualize"—"to become" the potential intended. When one observes this potential freed from a disease process, then one realizes the intensity of this drive. The life drive within each one of us is always prevalent unless it becomes overwhelmed from sources over which it has no control. A metabolic dysfunction will not kill you directly, but given time and lack of control, it will undermine this life drive until the third stage of the G.A.S. is reached—exhaustion. At this point both body and mind are depleted. The death wish then becomes manifest because the person cannot resist any longer.

Summary

It would seem that "emotional" problems can stem from one of two sources:
1. A conflict between ideas and feelings.
2. A malfunction of the body chemistry.
These emotional problems may then take one of four courses depending upon the individual, environment and other factors: 1. The person with emotional conflict may become "stuck" in the second (resistance) stage of the G.A.S., thus demonstrating few somatic complaints and finding these to be reversible with psychotherapy.

2. The emotional conflicts may cause such strain that the individual passes into the third stage of the G.A.S. (exhaustion), thus chemical or organ dysfunction becomes seriously involved and treatment at both physical and mental level is necessitated.

3. The individual may be born with defective body chemistry which can be identified at an early age and requires medical treatment for its correction or maintenance of body stability.

4. Organic or chemical defects may lie latent within the individual until they breakdown spontaneously, thus again, requiring medical and psychological care to assist the individual in a rehabilitation process.

The diagnostic procedure should determine into which of these four categories an individual falls and appropriate therapies should be recommended. It should never be assumed that psychological treatment is all that is required until other factors have been eliminated.

In families where there is a history of nervous system diseases, diabetes or mental illness of any nature this is particularly important. It is believed that these problems are genetically linked although the specific manner in which this occurs has not yet been determined.

Treatments of these disorders are far from perfected and require much more work to be done. We are only scratching the surface of the possibilities, yet a great deal of it has already shown itself to be effective and can be utilized without hesitation, for the risk of side effects is small.

Once the source of the emotional problem has been described and a program of treatment determined, the follow through
SCHIZOPHRENIA

is, of course, the responsibility of the patient. It is one's responsibility to come to know oneself, to know just what situations are stressful. A biochemical orientation in no way removes this responsibility from the individual. It does give one the means with which to find this responsibility to be within the limits of capabilities.

The manner of following through on the diagnosis will be a product of many factors, primary among which is the individual's desire to actualize oneself and one's motivation to find a more satisfying way of life.

INFORMATION FOR MANUSCRIPT CONTRIBUTORS

Manuscripts submitted for consideration and editorial correspondence should be directed to one of the following Co-Editors:

Abram Hoffer, M.D., Ph.D.
1201 CN Towers, First Avenue South
Saskatoon, Saskatchewan, Canada

J. Ross MacLean, M.D.
Medical Director, Hollywood Hospital
515 Fifth Avenue,
New Westminster, British Columbia, Canada

Humphry Osmond, M.D., Director
Bureau of Research in Neurology and Psychiatry
Princeton, New Jersey

Submit typewritten manuscript in triplicate, double-spaced on 8/2 by 11 in. paper, with good margins. Authors' full names, academic or professional affiliations and degrees should be given. Also include head and shoulder glossy print of author and co-authors. Tables, illustrations and references should be cited in numbered sequence in text. Tables should be numbered and typed on separate sheets. References should follow style of the "Index Medicus" and should be listed in order by number.

Co-Editors reserve the right to refuse any manuscript submitted, whether solicited or unsolicited, and to suggest modifications before publishing.

Illustrations. Submit as black-ink drawings of quality or clear glossy prints. Identify each illustration by number, indicate "top" on upper left-hand corner of back; write lightly, use soft pencil. Legends must accompany each illustration.

Authors' corrections. Galley proofs will be submitted to authors for correction; prompt return will facilitate prompt publication. Cost of corrections (other than typographic errors), deletions or additions will be charged to authors.

Reprints. Authors may order reprints, at regular rates, when galley proofs are returned to the publishers: Lowrie Associates, Inc., 6950 France Avenue, Minneapolis, Minnesota 55435.