

The Newsletter of THE AMERICAN INSTITUTE OF STRESS

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VITAMINS, AGING AND STRESS

In 1897, a Dutch physician named Christiann Eijkman proved that there was an unusual ingredient in unpolished rice that was vital for the proper function of the nervous system, for which he later received the Nobel Prize. It was not present in polished rice, the main source of food in some parts of Asia, where its deficiency resulted in a disease characterized by severe weakness, and even paralysis. In India, it was called "beri-beri", a Singhalese term meaning "I cannot", signifying that the person was just too weak to do anything. In 1911, the Polish-American biochemist, Casimir Funk, isolated a substance from rice polishings that appeared to contain this important factor. He named it *vitamine*, from the Latin *vita* for life, and *amine*, since it appeared to fall under this chemical classification. This later became vitamin, a general term for unrelated substances subsequently found in other foods that were similarly essential to prevent different diseases. Funk had discovered Vitamin B₁, which became known as thiamine after its isolation in

1926, and by the time it was synthesized 10 years later, at least eight other vitamins had been isolated and their deficiency states described. Since then, five more have been added to the list, the most recent being folic acid, and the search for others continues.

However, it had long been recognized that specific foods appeared to have unusual healing powers in certain illnesses, which we now recognize as deficiency diseases. The Egyptians used liver to treat night blindness, and pine needles and citrus fruits were later found to prevent and cure scurvy. When researchers learned how to produce deficiency diseases such as beri-beri and scurvy in laboratory animals by feeding them deficient diets, they were amazed by the ability of minute amounts of the missing ingredient to restore health. Subsequent research was devoted to determining the minimum daily amounts of different vitamins that were required by humans to prevent deficiency diseases. The Recommended Dietary Allowances (RDA) for six of them were published in 1945 by the National Research Council, but

ALSO INCLUDED IN THIS ISSUE

Physiologic vs. Pharmacologic Effects of Vitamins	2
Linus Pauling and Vitamin C	2
Stress, Aging, and Antioxidants	3
Trace Elements and the Irony of Iron	3
Reducing Wear and Tear of Stress	4
The Effect of Stress on Hepatitis B Vaccination Results	4
Stress Responses and Type A Behavior in Pre-School Children ..	4
Nurse Collects for Emotional Distress	5
Type A Behavior, Hostility and Blood Clotting	5
Stress and IBS in Females	5
Stress, Serotonin, and Violence	6
Stress and Relapse of Breast Cancer	6
Can Surgery Spread Cancer?	6
More on the Cardioprotective Effects of Pets	7
Can Stressful Dreams Kill?	7

(Continued on page 2)

For further information on the original source of abstracts and other reprints available on similar subjects, please send a self-addressed stamped envelope to: Reprint Division, American Institute of Stress, 124 Park Avenue, Yonkers, NY 10703.

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The Newsletter of
**THE AMERICAN INSTITUTE OF
 STRESS**

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caused so much controversy, that in 1989 this was changed to "Recommended Allowances", as opposed to "Standards", to avoid any implication that a final conclusion had been reached. That proved to be a wise move, since the debate over RDA's has accelerated due to the dramatic change in our appreciation of the need to distinguish between physiologic and pharmacologic effects of vitamins.

PHYSIOLOGIC VS. PHARMACOLOGIC EFFECTS OF VITAMINS

Vitamins have been traditionally viewed as substances required in minute amounts to prevent or treat specific diseases caused by their deficiency, and taking more than this provided no additional health benefits. Thus, although Vitamin A cured night blindness, it would not help a normal person to see any better at night. Similarly, Vitamin B₁₂ dramatically corrected the low hemoglobin and weakness of pernicious anemia, but would be of little value for patients with anemia or weakness of other origin. Many vitamins appeared to function as catalysts, since although their presence was required for certain enzymatic activities, they did not enter into the reaction. It's much like a matchmaker who introduces two people, but is not involved with what happens after their union takes place. It was generally believed that a well balanced diet would provide all the vitamins anyone needed, and that taking any more than the RDA was a waste of money, since the excess amount would be automatically excreted.

However, after they became readily available in all sorts of combinations, there were numerous anecdotal reports about the benefits that could be derived from taking various supplements. Since they seemed to be harmless and were relatively inexpensive, many felt they had nothing to lose by taking much larger amounts for symptoms of tiredness and weakness, or to insure optimum stamina and vitality. By 1980, one out of three Americans was taking vitamins on a daily or regular basis. For those who went overboard on fat soluble Vitamins A and D, which are not excreted as rapidly as water soluble B's or C, toxic effects often resulted. Some physicians were also enthusiastic about the use of massive doses of Vitamin C to treat colds and cancer, or Vitamin E for heart disease. Such claims were generally greeted with skepticism and derision by the medical establishment, because of the lack of any scientific explanation of possible mechanisms of action, and the ingrained assumption that vitamins were useful solely to prevent or treat deficiency states.

However, that started to change in 1955, when it was demonstrated that large doses of niacin, or Vitamin B₃, could lower blood cholesterol levels, a health effect that had nothing to do with its coenzyme role in preventing pellagra. Other research also revealed that the minimum amount of vitamin E needed to prevent the classical deficiency signs of muscle weakness and testicular degeneration in laboratory animals was less than a third of that required to maintain maximal immune responses, a finding subsequently confirmed in humans. Smokers needed almost twice the amount of Vitamin C than non smokers, and it soon became obvious that a variety of environmental factors, drugs, infections and other stresses also influenced vitamin requirements. This made it difficult to arbitrarily recommend a meaningful daily allowance for everybody, if we were to use health endpoints, rather than preventing deficiency disorders, as a more logical goal.

LINUS PAULING AND VITAMIN C

Linus Pauling, who won an unprecedented two Nobel prizes, made Vitamin C a household word in the late seventies, suggesting that optimal intake could prevent strokes, heart disease, mental illness, colds and cancer, and might increase longevity by 12 to 18 years. In contrast to the government's RDA of 60 mg, which still persists, he suggested taking between 3 to 12 thousand mg daily, a dosage equivalent to that found in 45 to 170 oranges. Although ridiculed by the medical profession at the time, he appears to be living proof of his theories, and credits his ability to continue to vigorously pursue his interests at the age of 91 to taking an average of 18,000 mg daily for years. Recent research increasingly supports Pauling's contentions,

and also provides some insight into why Vitamin C is particularly abundant in spermatozoa and eye tissue, and 200 times higher in immune system cells than in the blood. They also confirm the strong links between stress and aging.

STRESS, AGING, AND ANTIOXIDANTS

Hans Selye, who coined the term stress, defined it as "the rate of wear and tear on the body" - which is also a pretty good description of the aging process. Stress causes premature aging and degenerative diseases in experimental animals, and accelerates the development of characteristic microscopic changes associated with old age, such as arteriosclerosis and distorted and pre-malignant changes in various cells. Most of the manifestations of aging appear to result from the actions of "free radicals", molecules which are released during the course of normal metabolic activities that consume oxygen. Free radicals are highly reactive, and latch on to whatever they come in contact with, injuring cell membranes, inducing mutations in DNA and genes, and causing widespread and bizarre disturbances in normal cellular function. They are normally held in check by natural antioxidants which we are able to manufacture to a limited degree. Antioxidants scavenge the body to seek out free radicals and render them harmless. As antioxidant levels and immune defenses decline with age, unopposed free radicals run rampant, accelerating the development of atherosclerosis and wreaking general havoc in other ways.

Cholesterol is a vital constituent of all cell membranes, and since it is really quite inert, it has always been difficult for scientists to understand how it could contribute to atherosclerosis. Most now believe that the real culprit is oxidized cholesterol caused by free radicals. Once cholesterol is oxidized, it acts as a magnet to attract other cells that cumulatively form an atherosclerotic plaque that eventually clogs up arteries. Low density lipoproteins (LDL) seem to be the worst offenders, and when oxidized by free radical activity, attract white cells which release hormones that cause proliferation of smooth muscle cells in the arterial wall, causing further vessel constriction that can lead to a coronary or stroke.

Vitamin C is a powerful antioxidant. It prevents the ability of free radicals to form atherosclerotic lesions even when cholesterol levels are extremely high, and reduces DNA damage associated with malignancy. Recent research appears to increasingly confirm the value of Vitamin C in preventing coronary heart disease, atherosclerosis, cancer, and possibly some psychological and neurological disturbances. Beta-carotene, a precursor of Vitamin A, as well as Vitamin E, are also potent antioxidants, and have been demonstrated

to provide similar significant benefits some of the above, as well as Parkinson's disease, cataracts, and other age related disorders. However, the dosage of Vitamin E needed to prevent the oxidation of cholesterol is more than ten times the amount that can be obtained from dietary sources.

TRACE ELEMENTS AND THE IRONY OF IRON

In addition to vitamins, trace elements like selenium and chromium are antioxidants but may not be available. It is estimated that over 90 per cent of U.S. adults have a chromium deficiency because it is very hard to absorb. A new, readily assimilated bioactive source called chromium picolinate has been developed which was recently reported to extend the lifespan of rats by more than one-third, and may have similar effects in humans. Zinc and magnesium deficiency is also common in the elderly, and supplements can improve loss of taste, smell and other sensory faculties, and improve general strength and cardiac function. Chronic fatigue syndrome has now been linked to stress and appears to result from a disturbance in corticotropin releasing hormone. Although conventional magnesium measurements are usually normal, red and white blood cell levels are low, and symptoms of fatigue can be significantly improved by taking various magnesium preparations. This again emphasizes that simply measuring blood levels may not be an adequate assessment of the need for certain vital nutrients.

On the other hand, metals like copper and iron are oxidants that can facilitate the harmful effects of free radicals. A highly acclaimed Finnish study recently reported that the amount of stored iron in the body was second only to cigarette smoking as the strongest risk factor for heart attacks. We were all told as kids to eat spinach so we could be strong like Popeye, and older folks similarly take Geritol because of its high iron content, to improve their vim and vigor. However, these practices, as well as taking iron supplements and eating lima beans, liver, and fortified cereals, may soon be replaced by yogurt and monounsaturated fats like olive and peanut oil, which have cardioprotective effects because of their antioxidant properties.

It seems obvious that we need to reevaluate our current thinking about the nature and amount of vitamins, minerals and other nutrients that are optimal, as well as the advantages and disadvantages of various foods. Similarly, elevated blood cholesterol per se may have little significance for the development of atherosclerosis compared to oxidized LDL. While drugs may be equally effective in lowering blood cholesterol levels, only those with antioxidant properties for LDL prevent the development of atherosclerotic plaque.

REDUCING WEAR AND TEAR STRESS

These research findings also confirm the strong links between stress and aging. Vitamin C requirements can be sharply increased during stress, and prior to the availability of hormonal assays, stress responses in laboratory animals were routinely measured under by the degree of Vitamin C or ascorbic acid depletion that was seen in the adrenal cortex under the microscope. The current free radical hypothesis of aging is merely an updated version of the old "wear and tear" theory. It proposes that like machines, our life spans are determined by the amount of daily stresses that result in metabolic activities which release unopposed free radicals. It seems quite likely that reducing stressful wear and tear on the body, and taking advantage of the protective effects of certain Vitamins and minerals, while avoiding others, may reduce both heart disease and cancer. The future also looks intriguingly optimistic, with respect to improving the length and quality of life, by developing powerful biopharmaceutical antioxidants, such as superoxide dismutase. It is equally fascinating to consider that all of this started less than 100 years ago with a grain of rice, that is now causing us to take current dietary dogma with a grain of salt.

Paul J. Rosch, M.D., F.A.C.P.

President

The American Institute of Stress

The Effect of Stress on Hepatitis B Vaccination Results

In a recent study, Hepatitis B inoculations were given to fifty medical students on the third day of a three day final examination, to study the effect of academic stress on their ability to develop an immune response. Hepatitis B vaccine is usually given in three doses, with the second dose given one month after the first, and the third dose given six months after the first. About twenty percent of patients in this age group normally develop immunity after the first injection, sixty to seventy percent after the second, and ninety seven percent after the third. In this study, those students who became immune after the first injection (twenty five percent) showed significantly less evidence of stress and anxiety than those who did not convert at that time. An additional finding was that those students who reported greater social support in their lives, a potent stress buffer, also exhibited much greater immune responses to the vaccine at the time of the third injection as measured by antibody titers. This report confirms abundant research demonstrating that stress can depress immune system reactivity and function and can also influence immunization procedures.

Psychosomatic Medicine 54:22, 1992

Stress Responses and Type A Behavior in Pre-School Children

Concern has increasingly been expressed about the emergence of Type A behavior in children, even in preschoolers, where it may be fostered by competitive, time urgent and occasionally aggressive activities and programs. Type A assessment scales for children have been devised by Matthews and others, and the Bortner Short Rating Scale has also been used for this purpose. It has been suggested that increased sympathetic activity response to challenges may be responsible for the increased incidence of coronary heart disease in Type A's who characteristically demonstrate much greater cardiovascular hyperreactivity to competitive challenge situations than Type B's. This correlation was found in 11 and 12 year olds in U.S. and German reports. In a pilot study of a small group of 3 to 6 year old boys, high Type A scores were also found to be associated with higher elevations of blood pressure during challenge situations.

In a recent study designed to further explore this, thirty boys and thirty girls at day care centers in Sweden were studied between the ages of 3 and 4, and at 12 month intervals. At each examination a Swedish version of the Matthews MYTH Scale was obtained, blood pressures were recorded, and urine was analyzed for catecholamine and cortisol excretion. A variety of stressful emotional challenges or games appropriate for the particular age were engaged in, and blood pressure and endocrine measurements were obtained before and after each challenge.

The researchers found that Type A scores tended to remain fairly consistent, although this was not demonstrated for physiological reactivity. There appeared to be no significant correlation between Type A scores and cardiovascular reactivity, except in boys engaged in computer game challenges. This study failed to demonstrate a consistent relationship between Type A behavior and physiological reactivity in preschoolers, such as has been demonstrated in 11 and 12 year olds. Although Type A behavior is apparent in some preschoolers, its concomitant increased cardiovascular reactivity apparently has not yet been permanently established at this age.

Journal of Behavioral Medicine, No. 4, 1992

"Children have never been very good at listening to their elders, but they have never failed to imitate them."

James Baldwin

Nurse Collects for Emotional Distress

A recent Texas Appellate Court decision found that a nurse had a legitimate cause of action against a hospital for intentional infliction of emotional distress. The dispute arose when the nurse was asked to assist a certain physician, who was about to perform a continuous epidural anesthesia procedure for which she knew he had not been authorized. Both the physician and the nurse reported the incident to the hospital and she was subsequently fired for her disobedience. In her suit she claimed that she was terminated wrongfully as a retaliation for her refusal to follow the physician's orders. She also alleged that the hospital and its nursing director had held her up to ridicule among her peers and the professional community, causing her shame, professional humiliation and economic loss. The trial court entered a summary judgement for the hospital, but on appeal, the Appellate Court pointed out that the nurse's claim was for "intentional infliction of emotional distress." In finding for the plaintiff, the court ruled that she did not have to show evidence of physical injury in order to recover for mental anguish.

*Havens v. Tomball Community Hospital, 793
American Medical News 10/12/92*

"An error in the premise will appear in the conclusion."

Baxter's Law

Type A Behavior, Hostility and Blood Clotting

Type A behavior, and particularly its hostility component, are associated with an increased incidence of heart attacks. It has long been known that increased adrenaline secretion associated with stress hastens blood clotting. From an evolutionary point of view, this would have provided adaptive advantages in the "fight or flight" response to a combat situation. However, since the nature of contemporary stress is more apt to be due to an emotional rather than physical threat, rapid blood clotting is not only inappropriate, but could contribute to heart attacks and strokes. Blood clotting results from increased platelet clumping and the production of substances such as prostacyclin and thromboxane, which are normally produced when blood vessels are injured.

To study these relationships further, 66 male college students were classified as Type A or B using Rosenman's Structured Interview, hostility levels were obtained based on the basis of the Cook-Medley Scale, and thromboxane values and bleeding times were

measured. Thromboxane levels were highest in hostile Type A subjects, who also exhibited much quicker blood clotting than hostile Type B's and non hostile individuals. Hostile subjects also had higher thromboxane levels than non hostile ones following an exercise treadmill test. However, no significant differences were observed following a stressful, color naming task. This study confirms that the combination of Type A behavior and high hostility is associated with clot promoting activities that might partially explain the increased incidence of heart attacks in such patients. *Journal of Psychosomatic Research, 35:645-650, 1991*

"Zeal is fit only for wise men, but it is found mostly in fools."

Thomas Fuller

Stress and IBS in Females

A recent study appears to confirm higher levels of stress in women with Irritable Bowel Syndrome (IBS), than those who are healthy or have functional bowel complaints. 383 women, ages 20-40, were recruited from Planned Parenthood clinics, regardless of any history of bowel complaints. The subjects were classified as having IBS if they reported having abdominal pain relief after a bowel movement, and at least two of the following symptoms: loose stool at the beginning of pain; increased frequency of bowel movements when pain began; abdominal distension; rectal passage of mucus; frequent feeling of incomplete evacuation. Subjects who complained of abdominal pain with either constipation or diarrhea, but who failed to meet the above criteria, were classified as functional bowel disorder, and the remaining group reported no symptoms on a detailed gastrointestinal symptom questionnaire. They also completed this questionnaire at three month intervals over the next year, as well as another which listed stressful life events that had occurred during the intervening period, and also rated how distressing each event was.

The women with IBS reported experiencing significantly higher levels of stress and more stressful events than those in the normal group, and those with functional bowel complaints fell in between. The bowel symptoms that correlated best with the highest stress scores, were loose stools with the onset of pain, and a feeling of incomplete evacuation. While there has been ongoing controversy over the role of stressful life events and IBS, the authors concluded that this study appears to confirm that "Irritable Bowel Syndrome is a stress disorder."

*Gut, 33:825-30, 1992
Internal Medicine News, 10/1/92*

Stress, Serotonin, and Violence

Serotonin is a brain neurotransmitter that is intimately linked with mood and behavior. Most drugs used to treat depression act by influencing serotonin uptake in the brain, and low levels of serotonin have been linked with suicidal behavior as well as impulsiveness and violence, particularly in mental patients and criminals. The increase in violent behavior and suicide reported in patients taking cholesterol lowering drugs, is thought to be due to interference with serotonin production. Other authorities believe that the aggressive behavior sometimes seen in premenstrual syndrome may also be related to low serotonin levels.

To examine this further, monkeys were injected with serotonin lowering drug to determine if it altered their normal behavior. Animals with low serotonin levels were observed to be more likely to bite, growl, slap, and chase others, were more violent when exposed to threatening images, spend more time alone, and had much less body contact when they did mingle with others. Brain levels of serotonin appear to be genetically predetermined, which may explain the higher incidence of depression reported in patients with a family history of depression or violent behavior. This study implies that people with low serotonin levels may have difficulty forming close personal relationships, another characteristic finding in depression. There is also growing evidence that Type A individuals who score high on scales to rate aggression and hostility have tend to exhibit low serotonin levels.

U.S.A. Today, 10/29/92

"Anger without power is folly."

German Proverb

Stress and Relapse of Breast Cancer

Almost fifty women under the age of 70 with newly diagnosed breast cancer that had not spread beyond the axillary nodes were followed for an average of three and a half years. All had received either surgical treatment and/or radiotherapy, and were interviewed and evaluated 4, 24, and 42 months after surgery with respect to the degree of adverse life change events experienced, including bereavement, social difficulties (unemployment), as well as general health status during the previous 18 months. Spread of cancer was confirmed either by biopsy or X ray. During the study period, 23 percent of the study group experienced a relapse of breast cancer, and approximately half of these died. Recurrence of breast cancer was not associated with evidence of major depression before or

after surgery. However, distressful life change events or health related difficulties did appear to be related to likelihood of relapse if this occurred after surgery. Evidence of axillary node involvement and increased tumor size at time of surgery was also associated with a higher incidence of relapse, which may have affected the results. In addition, this sample size was relatively small and the duration of follow up comparatively brief.

It has been convincingly shown that cancer mortality is higher when there is poverty, unemployment, family disruption, and other psychosocial stresses. These effects are probably mediated by stress related hormonal influences that affect the rate of tumor growth and spread. In other studies, individuals who tended to suppress their emotions and/or evidenced a stoic acceptance of illness, and feelings of helplessness and hopelessness, also had poorer outcomes than others with a fighting, feisty attitude. Developing a feeling of control seems to be the common denominator here, and a variety of investigations are currently under way to explore the possible mechanisms of actions involved.

A.C.P. Journal, 11/12, 1992

Can Surgery Spread Cancer?

It is believed by many that cancer surgery can often cause the disease to spread. It is true that in certain instances, as with some tumors of the ovary, spillage of the contents during surgery can cause abdominal seeding of the malignancy. There are numerous anecdotal reports of patients who seemed to be doing well until they were operated on for removal of a malignancy, following which the disease seemed to spread like wild fire. Surgical stress does increase adrenal cortical hormone production which suppresses inflammatory responses, and this could favor the spread of tumor cells. To examine this further, hormonal measurements were made in cervical cancer patients during radical surgery, and it was noted that there was a significant increase in these hormones during the period of early convalescence. In animal studies, mice were injected with tumor cells and divided into a normal control group and one treated with adrenal cortical hormones. The hormone treated group developed considerably more lung tumor metastases. However, this could be prevented by the pretreatment with cytoxan, a drug frequently used in cancer chemotherapy. These findings have important implications for the possible prevention of post-operative micrometastases in cancer surgery and could lead to other effective strategies to reduce tumor spread.

Anti-cancer research, Vol. 12, pg. 1603, 1992

More on the Cardioprotective Effects of Pets

A variety of prior reports have demonstrated that pet owners are less likely to have heart attacks, and that having a pet reduces the likelihood of subsequent events. A new three year research study of almost six thousand individuals in Australia also confirms that pet owners have lower blood pressures, triglycerides, and cholesterol levels than non owner controls. These findings could not be explained by other factors such as cigarette smoking, diet, weight, or socioeconomic status. The researchers at Baker Institute, which is Australia's major cardiovascular research center, were initially cynical about the likelihood of obtaining any positive findings when they embarked on this study. It was undertaken because the Institute's President was aware of research showing that petting a dog lowered blood pressure, and was curious as to whether or not there were any long term benefits. The study group consisted of men and women between the ages of 20 to 60 who had come to attend a heart disease risk assessment clinic at the Institute, and had no prior knowledge about the purpose of the study, so that this was not a self selected group. All participants completed questionnaires dealing with lifestyles, diet, exercise, smoking, alcohol consumption, personal and family history of heart disease, and information that was also obtained about socioeconomic status and other demographic details. Blood pressure measurements were recorded on several occasions and blood samples for cholesterol and triglycerides were obtained. After this information had been obtained, pet owners were asked to identify themselves and to complete another brief questionnaire.

Of the almost 4,000 men and 2,350 women in the study, 784 reported that they owned one or more pets. Four hundred seventy six owned dogs, four hundred twenty one had cats, one hundred thirty six kept birds, one hundred six had fish in aquaria or pools, twenty

eight owned horses, and forty eight cared for other kinds of animals. The study revealed that the pet owners as a group showed significantly lower triglyceride and cholesterol levels as well as lower blood pressure readings in men. These findings were not as significant for women, although in female pet owners over forty, the age at which heart disease becomes a leading cause of death for Australian women, blood pressures were lower. There was no evidence that pet owners differed in terms of socioeconomic status, lifestyle, smoking, egg and salt intake, or body mass. However, they did appear to drink more alcohol and eat more take-out food.

The explanation for these findings is not clear, but may likely be related to the stress reduction effects of having a pet and caring or tending for something as previously reported in the Newsletter.

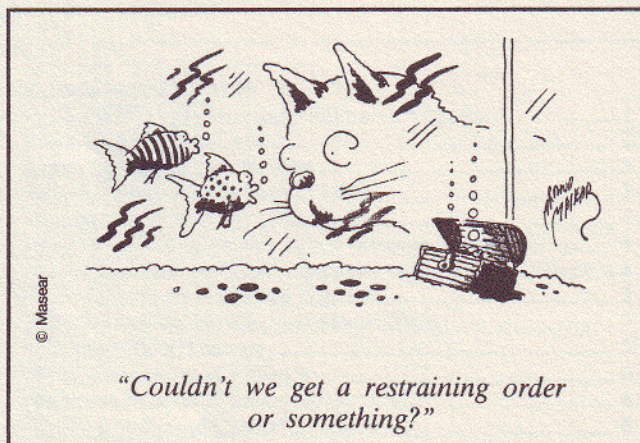
Interactions, Vol. 10, No. 3, 1992

Can Stressful Dreams Kill?

It has long been recognized that heart attacks and strokes are more apt to occur in the morning, usually within a few hours of awakening. This has generally been attributed to the increased release of stress related hormones like adrenaline which trigger the process of waking up and also cause increased platelet stickiness and other physiologic responses which put a strain on the cardiovascular system. A recent study in *The New England Journal of Medicine* suggests that "dreaming may be hazardous to your health", especially when associated with the release of stress hormones that are normally designed to prepare the body for flight or fight. According to the senior author, "even at 4 in the morning, when you think the body should be fast asleep and quiet, everything is pounding away. . . the sympathetic nervous system is in overdrive". Episodes of angina, which result from not enough oxygen getting to the heart often occur during sleep, and since people dream the most just before they wake up, researchers suggest that this may explain the increased frequency of early morning heart attacks.

During most stages of sleep, heart rate and blood pressure fall as sympathetic nervous system influences are dampened. However, during so-called rapid eye movement or REM sleep, when dreams occur, heart rate and blood pressure rise and the sympathetic nervous system may be twice as active as during daytime activities. Beta blocker drugs which blunt the action of stress related hormones have been shown to reduce the incidence of heart attacks. In susceptible individuals, administering these drugs at bedtime may provide significant benefits.

The N. Y. Times, 3/4/73, N.E.J.M., 2/4/93



Book Reviews • Meetings and Items of Interest

Book Reviews

The Interrelationship Between Mind and Matter

Beverly Rubik, Ed., The Center for Frontier Sciences, Temple University, Philadelphia, 1992, 281 pp., \$20.00 (paper)

This extremely interesting volume represents the proceedings of an International Round Table meeting hosted by the Center for Frontier Sciences at Temple University in May, 1989. Despite the time lapse, it could well have been written yesterday, and is unique because of its eclectic multidisciplinary approach to the complex subject of the myriad relationships between mind and matter. The fifteen contributors are all distinguished scientists, who approach these issues from different perspectives, ranging from psychokinesis and the investigation of the meaning of maps as it relates to perception and reality, to volitional effects on a bacterial system and a consideration of the paradoxical similarities and dissimilarities of mind and matter as viewed from a historical perspective. As one reads through these diverse presentations, they seem to have a common link in their biopsychosocioecologic approach to an emerging new paradigm. Nevertheless, much of what is offered is actually based on the rediscovery and integration of older truths and philosophic concepts long recognized in other cultures. The Fetzer Institute is to be congratulated for making this unusual meeting possible, and the editor deserves similar kudos for having the vision to assemble and integrate what would otherwise seem to be unrelated areas.

Meetings and Items of Interest

March 4-6 American Psychosomatic Society - 1993 Annual Meeting, Omni Hotel at Charleston Place, Charleston, South Carolina. Info: 1-800-THE-OMNI

March 10-13 The Society of Behavioral Medicine - Fourteenth Annual Scientific Sessions, Sheraton Palace, San Francisco. Contact Kenneth A. Perkins, Ph.D. (301) 251-2790

March 19-22, 1994 American College of Preventive Medicine; Association of Teachers of Preventive Medicine - Prevention 94: Clinical Preventive Medicine, Public Health, Occupational Medicine, Atlanta, GA (202) 789-0006

March 25-30 The Association for Applied Psychophysiology and Biofeedback - "New Visions - New Realities" Biltmore Hotel, Los Angeles, CA. Submissions must be postmarked by Sept. 16, 1992. Contact: Connie Maslow, Director of Meetings (303) 422-8436

March 22-25 ISC Division of Wellness - 12th Annual Role of Exercise and Nutrition in Preventive Medicine, Beaver Run Conference Center, Breckenridge, CO (813) 686-8934

April 2-4 Harvard Medical School, Massachusetts General Hospital, Department of Psychiatry - Mood Disorders: Effective Treatments, Copley Plaza Hotel, Boston (617) 432-1525

April 24-25 University of California, San Diego School of Medicine, Office of CME - The Cutting Edge Conference 1993: The Treatment of Severe Personality Disorders, Doubletree Hotel, San Diego, CA (619) 565-9921

April 27-May 28 New Science: New Physics and the Systems View of Life: the Holistic and Ecological Nature of the Emerging Paradigm, Devon, United Kingdom, Fritjof Capra, Schumacher College, The Old Postern, Dartington, Totnes, Devon TQ9 6EA, UNITED KINGDOM

May 14-19 University of California, San Diego School of Medicine, Office of CME - The Power of the Art: Introduction to Medical Hypnosis, Colonial Inn, Del Mar, CA (619) 259-6790

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