HEALTH AND STRESS

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DISEASES OF "CIVILIZATION" & RAPID CULTURAL CHANGES

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Surveys show that the vast majority of Americans believe that stress can cause different diseases. There is less agreement on which diseases and what types of stress are most likely to produce them. Acute and severe stress can cause sudden death from ventricular fibrillation due to stimulation of the sympathetic nervous system and an outpouring of adrenaline. Sustained stress such as that following the loss of a loved one is more apt to increase levels of cortisol, another adrenal hormone that has been shown to lower immune system resistance to infectious diseases including the common cold, tuberculosis, herpes and AIDS.

Chronic elevation of cortisol can also cause impairment of short-term memory and concentrating ability. In addition, there is good evidence that increased cortisol can contribute to the insulin resistance responsible for the current alarming rise in obesity, Type 2 diabetes, hypertension, lipid abnormalities and other manifestations of metabolic syndrome.

Particular personality characteristics appear to predispose some people to skin and bowel complaints that are considered to be psychosomatic in origin since they have no obvious organic basis and frequently follow stressful situations. Depression, anxiety, panic attacks and other psychiatric disorders can also be stress induced. Type A behavior has been shown to be as significant a risk factor for heart attacks as smoking, cholesterol and hypertension.

Certain individuals seem to be more susceptible to stress than others but whether this is due to heredity, environmental influences or a combination of both can be difficult to determine. Prior or repeated exposure to stress may result in the development of coping mechanisms that can increase resistance to disease. Strong social support is also a powerful stress buffer as is the perception of having a feeling of control.

It should be obvious from the above that numerous factors can influence whether stress will result in disease and possibly what that disease is likely to be. Our focus in this Newsletter will be on the deleterious effects of social and cultural change with an

ALSO INCLUDED IN THIS ISSUE

emphasis on how civilization can contribute to cancer and cardiovascular disease. Support for such cause-effect relationships comes from studies showing a relative absence of these disorders in primitive people. The same holds true for other groups whose dietary and other lifestyle habits have not significantly changed for centuries.

Stress & "Diseases Of Adaptation"

The term "stress", as it is currently used, was coined by Hans Selye a little more than six decades ago. Selye had discovered that laboratory animals subjected to a variety of very different and acute unpleasant stimuli seemed to show the same pathology. Extremes of temperature, deafening noise, glaring lights, exercise to the point of complete exhaustion and severe frustration all produced the identical picture of stomach ulcerations, shrinkage of the thymus and lymphoid tissues and enlargement of the adrenal glands.

He referred to this as "stress", which he defined as "the non-specific response of the body to any demand for change." At the time, it was clear that the tubercle bacillus and pneumococcus caused tuberculosis and pneumonia, scurvy and rickets were due to deficiencies of vitamin C and D and **it was generally assumed that all diseases had a specific cause.**

What Selye proposed was just the opposite; namely, that the same stomach ulcers could have several very different causes. He subsequently showed that prolonged stress could produce pathologic changes in other tissues similar to those seen in patients suffering from heart attacks, stroke, rheumatoid arthritis, kidney and other diseases.

He reasoned that if stress could cause this in his experimental animals perhaps it played a role in their clinical counterparts, which he labeled "Diseases of Adaptation". The crux of Selye's thesis was rooted in the belief that disease resulted from some threat that caused change because the body could not successfully cope with or adapt to the challenge. This concept was first proposed by Claude Bernard, the 19th century French physiologist who emphasized that good health depended on the ability of the organism to maintain the constancy of the *milieu intérieur* (internal environment). By this he meant the concentration of numerous substances in blood and tissue fluids, acid-base balance, body temperature, blood pressure, heart rate and a host of other chemical and physical properties that must be maintained within fairly narrow limits whenever anything threatens to change the status quo.

Fifty years later, Walter Cannon called the coordinated physiologic processes responsible for maintaining this stability "homeostasis" from the Greek *homoios*, meaning similar, and *stasis*, the ability to stay static or the same. Cannon also showed that fear, rage and other distressful emotions disrupted homeostasis. This was due to widespread endocrine and nervous system responses that were designed to facilitate life saving "fight or flight" responses.

Shunting of blood away from the gut to the arms and legs provided more strength for combat or speed in fleeing from an attacker. A surge of sugar from the liver supplied energy, quickened blood clotting, prevented loss from lacerations, a rise in blood pressure and heart rate, increased blood flow to the brain to improve decision making, dilated pupils extended the range of vision, and a host of other things happened that would have been purposeful for primitive man faced with some sporadic physical threat.

However, these are of little value in responding to the chronic emotional challenges that characterize contemporary stress. **Repeatedly invoked, it is not hard to understand how such ancient responses could contribute to an increased incidence of hypertension, stroke, peptic ulcer or muscle spasm.**

Civilization And Cancer

What about cancer? There is nothing to suggest that it can be caused by excessive or exaggerated "fight or flight" responses nor is it one of Selye's "Diseases of Adaptation". Yet, some malignancies do seem to have a strong link to stress and there is abundant evidence that cancer was rare or absent in primitive groups until civilization changed their customary way of life. The Eskimos are a prime example since, until several decades

ago, they still had what has been described as a "Stone Age" culture. Fortunately, the anthropologist and Arctic explorer Vilhjalmur Stefansson had an unique opportunity to extensively study various Eskimo tribes starting in 1906.

At the time, they were almost completely isolated from civilization save for occasional encounters with fur traders, frontier physicians, missionaries, whalers or explorers attempting to discover the location of the North Pole. The consensus of all these visitors was that cancer was unknown, as were asthma, appendicitis, rickets, scurvy, caries and other dental problems. Stefansson continued to study the Eskimos for several decades and summarized his findings in a 1960 book entitled *Cancer: Disease of Civilization?* In addition to his own detailed personal observations, he interviewed numerous individuals who were knowledgeable about the health of native Eskimo groups. All confirmed that following the intrusion of visitors from other countries whose diets and lifestyles began to be adopted, cancer and the disorders noted above progressively surfaced in those who had not succumbed to smallpox, measles and other Western infections to which they had no resistance.

One of the best informed was Roald Amundsen, the Norwegian polar explorer, who had spent a decade with different Eskimo tribes when Stefansson met him in 1906. As Amundsen wrote in his two-volume *Northwest Passage* (1908) "*the Eskimos living absolutely isolated from civilization of any kind are undoubtedly the happiest, healthiest, most honorable and most contented ...* ***My sincerest wish for our friends the Nechilli Eskimos is, that civilization may never reach them.***"

Amundsen had the opportunity to compare isolated Eskimo groups who never knew of cancer with others who had considerable contact with white men and was convinced that civilization was the culprit responsible for the development of cancer. Others had the same opinion. In *The Antecedents of Cancer* (1865), Charles Moore connected "*the progress of civilization with the increase of cancer, which has remained an incontestable theory to the present day.*" Dr. Charles Powell's *The Pathology of Cancer* (1908) noted, "*There can be little doubt that the various influences grouped under the title of civilization play a part in producing a tendency to cancer.*" Dr. Morley Roberts echoed this his 1926 *Malignancy and Evolution*, "*I take the view commonly held that, whatever its origin, cancer is very largely a disease of civilization.*"

The theme of *Cancer: Its Nature, Cause and Cure* (1957) by Dr. Alexander Berglas was also that native groups do not develop cancer. In his Preface, he expressed the opinion that, "*Civilization is, in terms of cancer, a juggernaut that cannot be stopped.*" This was supported by three other Prefaces. Dr. Antoine Lacassagne (Pasteur Institute) agreed that, "*The cancer situation of civilized man is still going from bad to worse*". Dr. Hans Lettré, a cancer researcher from Heidelberg noted, "*the artificialization of the environment of man - to which the organism fails to adapt - may be an essential cause of cancer.*"

In another Preface, the celebrated missionary surgeon and Nobel laureate Albert Schweitzer wrote, "*On my arrival in Gabon* [Africa] *in 1913, I was astonished to encounter no case Of cancer. I saw none among the natives two hundred miles from the coast. I can not, of course, say positively that there was no cancer at all, but, like other frontier doctors, I can only say that, if any cases existed they must have been quite rare. This absence of cancer seemed to be due to the difference in nutrition of the natives compared to the Europeans. In the course of the years, we have seen cases of cancer in growing numbers in our region. My observations incline me to attribute this to the fact that the natives were living more and more after the manner of the whites ... I have naturally been interested in any research tracing the occurrence of cancer to some defect in our mode of nutrition.*"

John Le Conte And The " Tanchou Law"

In addition to being a keen observer, Stefansson's book indicates he was also a thorough researcher. The earliest reference to the relation between civilization and cancer he could find was a "*Memoir on the Frequency of Cancer*" to the French Academy of Sciences in 1843 by S. Tanchou that

claimed, "*The disease seems to occur more frequently in the cities than in the country: it is almost unknown in the natives of America and Africa. In Egypt, one finds it among the Turkish women but not at all among the Egyptian peasants ... The disease is not rare among domestic animals nor among those in menageries; but there are no cases known in wild animals.*"

However, nobody seemed to know anything about Tanchou. Stefansson's search of the *Catalogue of The Surgeon General's Office* listed two Tanchou articles on cancer in French scientific journals referring to a much larger work that was apparently still in manuscript form since it had never been published. He contacted Alexander Berglas who replied that he had no knowledge of Tanchou. He then enlisted the aid of another good friend, Dr. Philip White, a distinguished cancer specialist. White had been invited to give a series of lectures at the University of Paris over a six-month period, during which he and his wife searched the archives of every possible library, publisher and academic institution that might have pertinent information. They were unable to retrieve the missing "Memoir" manuscript but sent a packet to Stefansson in 1959 containing their other findings that included this note:

"*A century ago a French doctor, Stanislas Tanchou, who had served with Napoleon in Russia and at Waterloo, retired to Paris and private practice after the wars. At the end of a lifetime of experience and study of the statistical distribution of cancer, by profession, by sex, age, and habits, Tanchou propounded the theory that cancer was a disease of civilization. Coming to the attention of Californians ... the idea impressed itself upon the minds of doctors and sea captains in the Alaska trade so that the early observations on the Eskimos were more than casual notations; these men were looking for cancer. That they did not find it gives their data more weight.*"

But how did the Californians find out about Tanchou and what exactly had he written? After intensive investigation, Stefansson discovered that most of Tanchou's writings had been quoted in papers by John Le Conte, an American who was also difficult to identify. Further research finally revealed a John Le Conte (1818-1891) who received his degree in Medicine from New York's College of Physicians and Surgeons in 1841. He wanted to pursue post-graduate education in Paris but was forced to enter general practice in his native Georgia. He had read summaries of Tanchou's 1843 "*Memoir*" in French and British medical journals which contained comments similar to those he had published eight months earlier in a "*Monograph on Cancer*" presented to the alumni of his medical school in 1842.

Le Conte apparently later gained access to much of Tanchou's unpublished manuscript which, like his own paper, had concluded that (1) cancer, while found in children, was mostly a disease of middle and old age; and (2) its incidence is greater in cities than rural areas. He quoted Tanchou's views extensively in several publications; such as the following: "*Tanchou is of the opinion that* ***cancer, like insanity, increases in a direct ratio to the civilization of the country****. And it is certainly a remarkable circumstance, doubtless in no small degree flattering to the French savant, that the average mortality from cancer at Paris during 11 years is about .80 per 1000 living annually while it is only .20 per 1000 in London!!! Estimating the intensity of civilization by these data, it clearly follows that Paris is four times more civilized than London!!*"

Le Conte quoted Tanchou's research showing that cancer was much more frequent in Paris than its suburbs. The same was true for Berlin and London where the number of cancer cases was increasing. In 1846, he announced the "Tanchou Law": "*The mortality from cancer increases in a direct ratio to the civilization of the country and the people.*" Le Conte later held several professorships and in 1869 became the first president of the University of California. He was very popular in San Francisco, which explains the "California" connection cited.

Other "Diseases Of Civilization"

Stefansson's commentary was often quite keen. Le Conte had correctly quoted that residents of Paris were four times more civilized than those living in London but he failed to mention that Tanchou used the

same criteria to claim that Parisians were 40 to 400 times more civilized than certain African groups. Stefannson suggested that the reason for this omission may have been that the War of 1812 with Britain was still fresh in the minds of Americans and embers of the 1776 revolution remained, so they enjoyed any opportunity to twist the tail of the British lion.

California was important since it was the U.S. gateway to the north Pacific. The purchase of Alaska two years before Le Conte's arrival had now made San Francisco the home port for Alaskan missionaries into what was formerly Russian territory and also for northwest Canadian whalers and traders. Stefansson befriended many of these individuals, including George Leavitt, a whaling captain, who, along with doctors on his ship had searched unsuccessfully for a decade to detect cancer in native Eskimos. One of these was Dr. Joseph Romig, a surgeon who settled in Anchorage. Both had been deeply impressed by the 1888 California State Board of Health's promotion of Le Conte's "Tanchou Law".

Romig was destined to become Alaska's most famous frontier physician. His views on civilization as a cause of cancer and other diseases, while well known locally, attracted little international attention until the 1939 publication of Dr. Weston A Price's widely hailed *Nutrition and Physical Degeneration*. Price described him as follows: "*Anchorage ... has an excellent government hospital, which has been built around the life of one man, who many people told us, was the most beloved man in all Alaska. He is Dr. Joseph Romig, a surgeon of great skill with experience among the Eskimos and Indians, both the primitive and modernized*." Price was a dentist in private practice in the 1930's who noticed that his patients were developing more chronic diseases and that his younger ones had increasingly more cavities, crooked, crowded teeth and deformed dental arches.

This was in sharp contrast to what he had observed a decade or two earlier. Price had also noticed and written about-the strong correlation between dental disease and physical health. A mouth full of cavities was associated with increased susceptibility to numerous diseases, including tuberculosis, which was then prevalent. He had heard rumors of native cultures where primitive people were free of dental and other diseases and decided to verify this to determine what was responsible for their superior health. Price and his wife traveled around the world to study the few such groups that still remained and to interview doctors or others that might be of assistance.

Stefansson quoted a 1933 interview from the 1945 fourth American edition of Price's book in which "*Romig stated that in his thirty-six years of contact with these people he had never seen a case of malignant disease among the truly primitive Eskimos and Indians, although it frequently occurs when they become modernized*." The same held true for dental caries, scurvy and other diseases that he and most medical missionaries considered to be largely nutritional in origin. Stefansson met with Romig in 1940 to obtain details about diet and other lifestyle factors that might be pertinent.

Romig told him that he considered cancer to be nonracial in its selection of victims and that it was caused by environmental factors that were most probably nutritional in origin. He expanded on this in a 1948 paper he was asked to submit for Stefansson's forthcoming *Encyclopedia Arctica* that included the following "*... the very rare or missing nutritional-linked difficulties of the pre-Europeanization time were these, among others: appendicitis, arthritis, beriberi, cancer, caries (dental), constipation, corpulence, diabetes, epilepsy, gall stones, gastric ulcer, hypertension, night blindness, pellagra, rheumatism, rickets, and scurvy*."

Stefansson also interviewed numerous other physicians and individuals with expertise in this area who were of the same opinion. Some included asthma and mental disorders and emphasized the dramatic absence of breast cancer and obesity until the diet and ways of Western civilization were adopted.

Breast Feeding, Diet And Obesity

One of the dramatic differences deemed to be of particular importance was breast-feeding and child rearing. One

physician wrote, "*Children are nursed until they are 3 or 4 years old, according to what appears to be a universal habit among the Eskimos ... The child is carried naked on its mother's back under her clothes and held up by the girdle. When she wishes to nurse it she loosens her girdle and slips it around to the front without bringing it out into the air ... The affection of parents for their children is extreme, and the children seem to be extremely worthy of it. They show hardly a trace of fretfulness or petulance so common among civilized children, and though indulged to an extreme extent are remarkably obedient. Corporal punishment appears to be absolutely unknown, and children are rarely punished or chided in any way. Indeed, they seldom deserve it; for, in spite of the freedom which they are allowed, they do not often get into any mischief ... The older children take very good care of the smaller ones.*"

Another noted that most European mothers on the Labrador coast were "*unable to suckle their babies - the breasts are full of milk for a few days after birth, and the supply ceases - the result, no doubt of the preponderance of tinned and dried foods in the dietary of European residents.*" In contrast, Eskimo mothers had a plentiful milk supply for years; their infants grew strong and usually able to walk by 10 or 11 months. A nurse said, "*This I know, we never found any women with lumps in their breasts. I never knew, in all my 17 years of nursing in the hospital of a single woman who did not breast-feed her child, and nurse it for 2, 3, and up to 4 years ... I never observed a caked breast or sore nipple.*"

Others observed that Eskimos had became progressively heavier after 1920 when "*women were learning from the whites to substitute canned milk and 'formulas' for breast feeding and to wean after a few months instead of a few years. Formerly, Eskimo women became pregnant only once in several years but since the Europeanization of their way of life birthrate is increased as much as threefold and they bear a baby every year.*"

Freedom from cancer was also reported in primitive groups all over the world who practiced prolonged breast-feeding.

This held true for native groups in Africa, South America and all climates. The Hunzas in Kashmir who have unusually good health and longevity have been extensively studied. Male babies are nursed by their mothers until the age of 3 and girls to the age of 2. Unusual vigor is often retained well into the eighth or ninth decade and although many lived much longer, unlike other countries, men outlive women by an average of 5 years.

Good health and the relative absence of cancer and coronary disease do not appear to be associated with any particular diet. The Eskimos eat lots of fat and fish and few vegetables, the Masai in Africa are meat eaters while the Hunzas are mostly lactovegetarians who eat little meat. What does seem to be common to all is that most of their foods are raw and much fresher when they are consumed. Unlike our daily fare, they are not processed or canned and are free of pesticides, preservatives and additives designed to make foods last longer or appear more attractive.

Industrialization has also introduced new foods like trans fats that have been linked to coronary disease and breast, colon and other cancers. Artificial sweeteners and particularly high fructose corn syrup are now believed to be a major contributor to the current epidemic of obesity and Type II diabetes. There is a clear correlation between the rising rates of obesity and consumption of fructose laden soft drinks, baked goods, candies, jams and all sorts of canned and packaged goods. Over the past two decades, high fructose corn syrup intake quadrupled to over 9.2 million tons. **A 12-ounce can of soda that is mostly water and high fructose corn syrup contains the same amount of calories as 10 teaspoons of sugar!**

Unlike other sugars, fructose is more readily converted into fat and does not trigger a release of insulin to lower blood glucose and provide a feeling of fullness that curbs carbohydrate intake. **Obesity has long been recognized to be a risk factor for cancer and cardiovascular disease. Like cancer, it is not found in animals that are not domesticated and is not seen in any native groups until they adopt Western diets.**

Sociocultural Stress And Roseto

Much more could be said about the role of diet. Civilization has changed the production and processing of staples like wheat and rice that have had harmful health effects. Industrialization has also introduced cigarettes, petroleum emissions and other cancer causing atmospheric pollutants. All of these, including dietary changes have occurred within a relatively short time period. Rapid change of any sort is likely to have adverse health effects.

Sociocultural change is no exception as evidenced by the increase in disease and especially coronary events associated with emigration. When Japanese moved from their homeland to the U.S. decades ago their rate of coronary heart disease quadrupled. Immigrants from India are at even greater risk with a fifteen-fold rise although almost half are strict vegetarians. Both of these substantial increases were completely independent of any change in diet or standard risk factors like hypertension, cigarette smoking or cholesterol levels.

Studies on the incidence of coronary disease in Japanese men show that it is lowest in Japan, increases in Hawaii and rises further in California. However, Japanese in Hawaii who maintained their cultural traditions were protected against heart attacks even though their cholesterols rose as much as emigrants who adopted Western ways and who began to die at the same rate as Americans. Interestingly enough, those who became "Americanized" but still preferred low fat Japanese food had twice as much heart disease as those who maintained their ancient traditions but preferred high fat foods common in the U.S.

A study of over 3000 Japanese-Americans in California similarly found that those who strictly retained their traditional habits had the same low rates of coronary disease seen in Japan. In contrast, those who were most acculturated to Western ways had a three to five fold increase. This significant variance also could not be accounted for by differences in diet, smoking, hypertension or cholesterol. The most likely explanation was the loss of traditional values that had resulted from relatively rapid sociocultural changes.

Michael Marmot, who did much of this research, explained why retaining certain traditional Japanese cultural values protected immigrants from heart attacks. These included strong social support and cohesive group activities and achievements that promoted a sense of stability and "togetherness". This was in sharp contrast to Americans who are much more mobile in regard to geographic and job changes and strive to attain their goals through personal rather than group efforts. It was the strong social support and stability of Japanese culture that provided protection from the "emotional and social stress" that Marmot believed to be an important cause of heart attacks.

Numerous studies support this premise such as Stewart Wolf's research on Roseto. When he began his study in 1962, the incidence of heart attacks in residents of this small Pennsylvania town was less than half of the national average or of neighboring towns who had the same water supply, physicians and medical facilities. This, despite the fact that Rosetans smoked as much and had the same cholesterol levels and probably ate more fat than most Americans. What was unique was that they were almost entirely descendants of Italians who had immigrated there 80 years previously and that the traditions of their forbears had been rigidly passed along over generations.

The family, not the individual, was the unit of their society. The community was their base of operations and each inhabitant felt a responsibility for its welfare. The elderly were respected and most households contained three generations. There was a strict taboo against ostentation so that there were no external trappings to indicate that any family was different.

Stewart predicted that protection from heart attacks would disappear as these traditional values disintegrated, which they did. Over the next 25 years, intermarriage with other religions became common as did ranch homes with swimming pools and fancy cars. During this period, although Rosetans were now smoking less and reducing fat intake their **rates of heart attacks more than doubled and hypertension tripled at the same time they were declining in the rest of the country**.

Tuberculosis, Sudden Death And The Stress Of Immigration And Rapid Changes

There is nothing new about any of this. Twenty-five hundred years ago, Hippocrates wrote, "Those things which one has been accustomed to for a long time, although worse than things to which one is not accustomed, usually give less disturbance." *In Civilization and Disease* (1938), C.P. Donnison, an astute physician with extensive experience in black Africa noted an almost complete absence of hypertension, heart disease, peptic ulcer and diabetes in remote areas of the continent where social structures remained stable. Alvin Toffler's *Future Shock* (1970) referred to "**a psychobiological disorder induced by subjecting individuals to too much change in too short a time ... Unless man quickly learns to control the rate of change in his personal affairs as well as in society at large, we are doomed to a massive adaptational breakdown.**"

When the potato famine forced thousands of Irish to immigrate to American seacoast cities in the 19th century, they were better fed and had more promise for the future. Yet the death rate from tuberculosis for those living in New York City was more than double that in Dublin during the same period. American Indians also died from tuberculosis at much greater rates when they were moved from the plains to reservations where sanitation and living conditions were better. Tuberculosis similarly killed hordes of Bantu natives who had been moved from the country to the suburbs of Johannesberg. It is well established that stress related hormones lower resistance to tuberculosis and other infections. Stress was also the cause of the "Hmong Sudden Death Syndrome" seen in Asian refugees after the Vietnam War. The Hmong worship their ancestors, believe that alll things have spirits and practice shamanism. The sudden shift from an idyllic agrarian life in the hills of Laos to U.S. cities was a severe shock for many who seemed perfectly healthy but died suddenly, usually in their sleep. This often occurred in young men who typically displayed labored breathing, screams, and frantic movements just before expiring. The Centers for Disease Control thoroughly investigated well over a hundred of these mysterious deaths in 1988 but could find no medical cause or cardiac abnormality. The most likely explanation was ventricular fibrillation, a lethal disturbance in heart rhythm that has been shown to be precipitated by sudden and severe stress such as might be experienced during a very frightening nightmare.

Unfortunately, the space constraints and the format of this and most Newsletters make it impossible to include important relevant material and references that many subscribers have requested. Because of this and rising production and postage costs, we will be changing over to an electronic version in a few months that will allow additional and frequently more current coverage of certain topics. This will also provide a more convenient way to save and reference issues of particular interest. **It will therefore be necessary for subscribers to send their preferred e-mail address to:**

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