

## Personality: Links to cancer, heart disease

The human mind and body are tied together in an extraordinarily complex fashion, but with what seems to be increasing regularity researchers report on the gradual unraveling of this Gordian knot. An ongoing study at Johns Hopkins University, for instance, suggests that certain psychological and personality factors may be precursors of some very physical conditions—cancer and heart attack.

Between 1946 and 1964, Caroline B. Thomas collected data on 1,337 medical students at Johns Hopkins. Complete physical examinations, psychological profiles and family histories were recorded. With yearly questionnaires, Thomas has kept track of these students and compiled physical and mental health dossiers on each. Through 1974, there had been 43 cases of cancer, 14 heart attacks, 38 reports of serious mental problems and 16 suicides. By correlating these facts with previously collected physical and personality findings, Thomas and her co-workers have come up with some interesting (if still tentative) conclusions.

Cancers tended to develop in people who were generally quiet, nonaggressive and emotionally contained. Such persons scored low on tests of anxiety, anger and depression. Many were lonely individuals who had not been very close to their parents. More than 30 percent of the cancer patients, for instance, had reported that their fathers were not companionable, understanding or warm. Less than 10 percent of the medical students who have not developed tumors reported this alienation from family.

The apparent link between personality traits and cancer is not entirely unsuspected. In the Aug. 8 *SCIENCE* Vernon Riley of the Northwest Research Foundation in Seattle, Wash., reported that stress can play an important role in the development of cancer in mice. Anxiety and fear caused by shipping and handling are stressors for mice. A strain of mice carrying a cancer virus developed cancers 92 percent of the time when they were exposed to moderate, chronic or intermittent stress. Similar mice protected from such stress developed cancers only seven percent of the time. Riley suggested that "the physiological effects of stress lead to an impairment of the host defense system, and thus a presumed increase in susceptibility to cancer." The loneliness, alienation and isolation that were part of the personalities of the cancer patients in Thomas' study could have been stressors that weakened their immune systems and led to increased susceptibility to cancer.

Thomas' study also suggests a link between personality traits and heart attacks. More than 100 of the students had high levels of blood cholesterol when first tested, but only 14 have had coronary

attacks. This does not deny the link between cholesterol and heart attack, but it does indicate that other factors may be involved. Thomas has found that the coronary victims scored high in depression, anxiety and nervous tension. They tended to suffer from insomnia, were often tired in the mornings and had generally lower grades than did the other medical students. The high-cholesterol students who have not had heart attacks were typically calm individuals who were low in such things as anxiety, nervous tension and depression.

The Johns Hopkins study confirms the fact that doctors take their own lives at

a rate three or four times higher than that of the general population in the United States. This may be due to several factors: the competitiveness of their profession, their familiarity with death and their easy access to the means of committing suicide. Those who did commit suicide and those who suffered from mental problems were in some ways similar to those who developed cancer. They had displayed negative attitudes toward their families, they were highly sensitive to stress and were often isolated or lonely types.

Although the complexities of the mind-body connection are far from being explained, it is long-range, prospective studies, like the one being conducted at Johns Hopkins, that will eventually help to untie this particular Gordian knot. □

## Encephalitis cases: Six times normal

Cool autumn nights will bring more than just colored leaves this year: Plummeting temperatures in the next few weeks should wipe out the remaining mosquito populations in most areas and end an epidemic of encephalitis that has reached national proportions this summer.

The U.S. Public Health Service Center for Disease Control in Atlanta reports 655 cases this year, involving 41 deaths. That is about five times the number of cases in recent years, a CDC spokesman says. Most of the cases have been the relatively serious St. Louis encephalitis. Among the hardest hit have been southern states, especially Mississippi, Alabama, Texas and Tennessee and midwestern states, Illinois and Indiana. Although reports of new cases seem to be dropping off along with the temperatures, public health and mosquito abatement districts in hundreds of localities are stepping up their preventive programs.

St. Louis encephalitis (also known as sleeping sickness) is, like the other forms of that disease, a mosquito-borne viral inflammation of the brain. The virus is harbored in common bird species, often sparrows and blackbirds, is picked up by mosquitoes and transferred to humans through mosquito bites. The symptoms include stiff neck, headaches, vomiting, drowsiness, fever and in severest cases, coma and death. The very elderly and the very young are most susceptible. "Most of us wouldn't even notice if we'd been bitten," the CDC spokesman says. There is no specific treatment for the viral infection; physicians are limited to treating the symptoms of the disease and hoping the body's immune system will overcome the infection when it occurs.

Prevention on the community level involves destroying mosquito populations, specifically members of the genus *Culex*, carriers of St. Louis encephalitis. Standing water is drained when possible, and low-lying areas are sprayed with insecticides, most often Malathion. Besides

stepped-up spraying efforts by individual communities (particularly those in hard-hit states), public health scientists are testing for the presence of the encephalitis virus in local bird populations. There is no national mosquito-abatement system, and CDC does not have a complete national picture of current preventive efforts, but spraying and testing efforts have definitely intensified.

Prevention on a personal level involves the draining of standing water around one's house or yard and checking to make sure screens and windows are tightly fitted. Mosquitoes come out to bite around dusk, and people in areas where encephalitis cases have been reported, particularly the very old and very young, are advised to wear long sleeves and perhaps mosquito repellent, during those hours, the CDC spokesman says. □

## Weighing in Vela X-1

Weighing a star is a complicated business, but a necessary one for astrophysicists. The masses of different kinds of stars are important inputs to theories about their behavior. This is especially true in what might be called astrophysical eschatology, the science of the last stages of stellar life. Whether a dying star becomes a white dwarf, a neutron star or a black hole depends strongly on its mass.

The mass of one such stellar end point, the supposed neutron star called Vela X-1, has now been determined by three astrophysicists at the Massachusetts Institute of Technology, Paul C. Joss, Saul A. Rappaport and Jeffrey McClintock. It is a doubly interesting contribution, because the amount determined, 1.7 times the sun's mass, would set some new constraints on the theorizing about conditions inside such bodies.

The first necessity for determining the