BIOMEDICINE

High blood pressure and stress

Whether psychological stress can trigger high blood pressure seems to depend on genetic susceptibility, Richard Friedman and Lewis K. Dahl of Brookhaven National Laboratory reported at the 48th Annual Scientific Sessions of the American Heart Association in Anaheim, Calif., last week.

They first identified two strains of mice with opposite genetic predispositions to hypertension. When one strain, for example, ate excess salt, it developed severe, fatal high blood pressure; when another strain ate the same amount of salt, it did not develop high blood pressure. The investigators then studied the two strains to see whether they showed different blood-pressure responses to stress.

The animals were required to press a lever to get food pellets. Sometimes, though, the lever-press response brought an electrical shock. After exposure to such stress over 26 weeks, both strains had reduced their lever presses about the same, suggesting that each felt the stress equally. The two strains differed markedly in their blood-pressure response to stress, however. The strain that had developed high blood pressure to various stimuli also developed it in response to stress. The strain that had been immune to high blood pressure before was also immune under the influence of stress.

Detecting heart disease early

Simple monitoring of the pulse can help physicians detect heart disease very early and promises to be superior to ongoing techniques, Howard H. Wayne and his team at the San Diego County Heart Center have found.

The technique, called apexcardiography, consists of placing a pulse-sensing device on the chest where the heartbeat can be felt. Attached to a standard electrocardiograph which measures the electrical signals of the heart, the pulse sensor records, also in wave form, the way in which the heart contracts and relaxes. In this way, it is possible to detect abnormalities of the left ventricle, the main pumping chamber of the heart, during both the contraction and relaxation stages of the heartbeat, often before such irregularities turn up in the electrocardiogram. The technique also promises to be more accurate and easier to give than arteriography, which requires the introduction of a special dye into the heart through a catheter threaded into the heart from a leg or arm vessel. The dye then allows the heart to show up on X-ray film.

Wayne reported his group's findings at the 48th Annual Scientific Sessions of the American Heart Association.

FDA crackdown on blood banks

Because blood from paid donors is five times more likely to transmit hepatitis than blood from volunteer donors, the U.S. Food and Drug Administration is stepping up its efforts to protect blood recipients from such transmission.

The FDA announces that it has now extended its jurisdiction over blood quality not only to the 500 interstate blood banks but also to the 7,000 blood banks within states. The FDA has also set up new standards for the collecting, processing and storing of blood and blood products. For example, all blood banks will be required to test their blood for hepatitis. The FDA is also attempting to set up a new requirement whereby blood banks have to label all the blood they collect. The label would say whether blood is from a paid or voluntary donor and would carry the warning that blood obtained from paid donors is associated with a high risk of transmitting hepatitis. The proposed requirement is being published in the FEDERAL REGISTER.

ASTRONOMY

Quasars: An argument for nearness

James Terrell of the Los Alamos Scientific Laboratory believes that quasars are objects that are not at cosmologically important distances, but rather quite near our galaxy. In that belief he represents a minority of the scientists who concern themselves with these phenomena. In some recent observations of the radio galaxy Centaurus A done at the Cerro Tololo Observatory in Chile, he finds an argument to bolster his view, and he makes his suggestions in the Nov. 13 NATURE.

The Cerro Tololo photographs showed visible filaments connecting the visible galaxy of Centaurus A with the exterior lobes that give off the radio emission. Associated with these lobes are blue starlike objects never before seen near that galaxy.

Quasars, it happens, look bluish, and Terrell suggests that these blue objects located perhaps 80,000 light years from the center of the galaxy would look to observers from inside that galaxy about the way quasars like 3C273 look to us. Since the blue starlike objects are located in the radio lobe, they may be radio emitters as quasars are.

Interstellar cyanamide

Molecular astronomers have discovered a number of molecules in the interstellar dust and gas clouds that contain various combinations of nitrogen, hydrogen and carbon, and this has led them to look for others of the same ilk. After a long search they have now turned up evidence of cyanimide (NH_2CN) in the cloud Sagittarius B2. The work was done by B.E. Turner, H.S. Liszt and N. Kaifu of the National Radio Astronomy Observatory at Green Bank, W. Va., and a visitor at Green Bank, A.G. Kislyakov of the Gorsky Radiophysical Institute in the U.S.S.R. (ASTROPHYSICAL JOURNAL, 201:L149).

A peculiarity of cyanimide is that it is the first interstellar molecule that has the so-called NCN frame in its structure, an arrangement in which a central carbon atom is singly bound to a nitrogen on one side and triply bound to a nitrogen on the other. Cyanimide is industrially important: On earth it reacts with water to form urea and with ammonia to form guanidine. In theories of the formation of organic compounds that were supposedly precursors to the emergence of life. "it also plays a central role," the observers remark. It has been formed in the laboratory by allowing electrons of 4.5 million electron-volts energy to irradiate a mixture of ammonia and methane in aqueous solution, in one of the experimental attempts to duplicate conditions on the early earth.

Cosmic rays take the tunnel

The lifetime of cosmic rays, from their production to their arrival at earth, can be estimated from the abundances of different particles in them and the energies they exhibit. The latest such estimates on this basis are between 10 and 20 million years. The problem is, these figures are not congruent with an estimate based on the average density of interstellar matter supposedly traversed by the cosmic rays, which gives about 3 million years.

Therefore, John S. Scott of Kitt Peak National Observatory suggests that the cosmic rays come through tunnels. Some time ago, D.P. Cox and P.W. Smith suggested that the galaxy is honeycombed by tunnels blown by supernova explosions. Cosmic rays are thought by many to come from supernovas, and Scott suggests they are likely to be blown preferentially into the tunnels where the density of matter is much less than elsewhere. A cosmic ray would stay in the tunnel because of magnetic reflection at the walls until it found a field line along which it could escape (NATURE, 258:58).