

metabolic rate goes up rapidly. They expend 100 percent more energy than do control animals and consume substantially more oxygen. The metabolic rate of the animals remains high during the initial weight-loss period after the stock diet is resumed. Brown adipose tissue is the agent suspected of burning off those excess calories. BAT, which can produce a prodigious amount of body heat, is known to help animals adapt to low temperatures (SN: 1/15/77, p. 42). And Rothwell and Stock find more than twice the amount of BAT in cafeteria-fed rats than in controls. The amount found in animals after 21 days of overeating is similar to that in rats adapted to 5°C.

While BAT is found in human newborns, it was not thought to function in adults, where it makes up only 1 percent of the body weight. Rothwell and Stock, however, demonstrated its activity in themselves by taking a drug that stimulates the heat production of BAT. The drug increased skin temperatures on the neck and upper back, the primary locations of human BAT.

Although the significance of BAT has not yet been demonstrated in human metabolism, Rothwell and Stock suggest that it could make an important contribution to energy consumption. "Similarly, a defect in, or an absence of, BAT would predispose to obesity," they say. Thus BAT could determine who gains weight easily and who does not. □

Simulated deep-sea dive sets record

A unique mixture of breathing gases last week allowed three men to simulate a 28-day deep-sea dive that doubled the depth currently considered practical. The key to the deep dive, according to Duke University researcher Peter Bennett, is a careful balance of nitrogen gas — a gas usually shunned by divers because of its narcotic effects at depths greater than 150 feet. Under Bennett's direction, Delmar Shelton, 40 years old, William Bell, 25, and Stephen Porter, 24, "dove" to the equivalent of 2,132 feet while breathing a mixture of 10 percent nitrogen, 0.91 percent oxygen and 89 percent helium. Divers commonly use a mixture of oxygen and helium.

Divers are currently limited to depths of 1,000 to 1,200 feet because of High Pressure Nervous Syndrome, a debilitating combination of tremors, vomiting, fatigue and lapses of consciousness that was named and described by Bennett in 1965. The syndrome is believed to be caused by the compression of cell membranes due to tremendous underwater pressures. In further experiments, Bennett found that model membranes expand when exposed to nitrogen. He suggested that nitrogen — carefully balanced between its depth-induced narcotic effect and its membrane

expanding effect — might help hurdle the 1,200-foot barrier caused by HPNS (SN: 11/6/76, p. 296).


Bennett began testing his hypothesis below 1,500 feet last year when Duke obtained a system of pressure chambers capable of simulating dives to 3,600 feet. In the most recent experiments, the three men were gradually taken on March 6 to a pressure equivalent to 1,509 feet. Satisfied with their condition after one week at that depth, Bennett asked the university's committee on human experimentation to approve a deeper dive. Permission granted, the divers gradually went to 2,132 feet, where they stayed for 24 hours. On March 15, decompression was begun and the divers emerged April 2 with no ill effects. According to Bennett, they spent about 16 days at pressures greater than 1,000 feet and 2.6 days below 2,000 feet. □

Risk factors in coronary bypass

When should a heart disease patient have coronary bypass surgery? Scientists have been grappling with this question during the past several years (SN: 5/3/78, p. 315), and one of their latest efforts to answer it is reported in the April 4 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION by Raymond G. Hoffmann of the Medical College of Wisconsin in Milwaukee and his colleagues. Certain preexisting factors lessen the chances of surviving coronary bypass surgery, they found.

Hoffmann and his co-workers studied 1,718 patients slated for coronary bypass surgery between 1970 and 1974 at two Milwaukee hospitals. Before the patients were operated on, information was obtained about their age, height, weight, smoking habits, whether they had high blood pressure or diabetes or whether they had had heart attacks or a stroke. Before surgery, the patients were also examined for the levels of cholesterol and fats in their bloodstreams, coronary artery obstruction and left ventricle function and blood pressure. The patients then underwent surgery and were followed up for five years.

The researchers report that survival was much lower in patients who, before their operations, had had a stroke, more than one heart attack, blood levels of cholesterol above 350 mg/dL, severely impaired left ventricular function or a left ventricular end diastolic pressure greater than 18 mm Hg. Survival was also much lower in patients who were older than 50 years of age and significantly lower in patients who had had severe coronary artery clogging before their operations. However, patient survival was not found to be influenced by patient height, weight, preoperative blood levels of fats, preoperative blood pressure, or whether the patient smoked or had diabetes. □



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