

Nerves Cause Sweating

Perspiration can be caused by stimulation of the nerves and is not always associated with body heat from physical exertion

► **THE PERSPIRATION** that shortened Astronaut Eugene Cernan's Gemini 9 spacewalk by fogging his faceplate could have been due to nerves instead of the heat of his exertions alone.

Nerve stimulation can cause sweating even if the body's temperature remains normal, two scientists at Indiana University, Bloomington, Ind., reported in *Science*, 152:1521, 1966.

Proof that this is true was found in experiments with three healthy young men who volunteered to perform isometric contractions against a stiff elastic cord while the circulation to and from their working muscles was arrested by an inflated pneumatic cuff placed high around the upper arm.

Sweating was markedly increased when warmed venous blood was prevented from reaching the heat-loss

center in the hypothalamus at the base of the brain. This discovery tends to refute the existing idea that an elevation of the hypothalamic temperature is essential for increased sweating during all physical work in a warm environment.

In other experiments, the researchers obstructed the blood supply of the left arm 30 seconds before three volunteers began pedaling a bicycle ergometer. The sweating responses of this arm were compared with responses of the same arm during exercise without obstruction of the blood supply, and with sweat rates recorded simultaneously on the opposite arm and lower leg.

Recordings showed that an immediate moderate or great increase in sweating could be evoked on the left arm in spite of the fact that the circulation was arrested.

While these results suggest that the stimulation of sweating is strictly nerve-induced, the investigators said it has been found that four minutes of circulatory arrest before exercise reduces the immediate sweating responses of the occluded arm by about 50%. Because rapid and large variations in sweating can be observed during arterial occlusion, it seems doubtful that the sweating responses during exercise are dependent on higher concentrations of adrenalin or other body fluids in the circulating blood.

However, it is doubtful whether enough heat can be liberated within two seconds after the beginning of muscular work to produce the highly increased sweat responses found.

Drs. W. van Beaumont and Robert W. Bullard of the department of anatomy and physiology, Indiana University, reported the study.

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SOCIOLOGY

Technological Society Can Use Dropouts

► **AUTOMATION** does not necessarily require that workers have more schooling, a Columbia University professor said.

There is no evidence that high school dropouts cannot handle jobs in automated industries, nor is there proof that the proportion of jobs suitable for dropouts is greatly decreasing, said Dr. A. J. Jaffe, director of the manpower and population program in Columbia University's Bureau of Applied Research. In fact, data "clearly suggests" that "the numbers of jobs which dropouts can do are increasing more rapidly than are the number of dropouts."

Dr. Jaffe based his assumption on a large study of workers in growth and nongrowth industries. He said that if automation really does require better educated employees, then it would be reasonable to assume that the mechanizing industries (those which have shown large increases in output per man hour since 1950) would have a better educated work force in 1960 than they did a decade ago.

However, Dr. Jaffe said, his study revealed no such correlation between automated industries and employee education.

In the U.S. economy there are "plenty" of jobs which dropouts can handle satisfactorily, commented Dr. Jaffe. Therefore the high unemployment rate among these people must be attributed to things other than lack of capacity. One thing may be that with a too-large labor force, employers can be and are selective for education, whether or not a high school diploma improves the quality of work.

As of 1966, dropouts comprised at least half the employed labor force. Dr. Jaffe reported in *Demography*, 3:35, 1966.

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NASA

COME BLOW YOUR HORN—This giant horn simulates noise made by Saturn booster engines and is used to help verify atmospheric conditions before rocket engines are test fired. Mounted on a 75-foot steel tower, the complete horn weighing 10,000 pounds was recently installed at the National Aeronautics and Space Administration's Marshall Space Flight Center, Huntsville, Ala.