

ANTHROPOLOGY

Uric Acid Built Up Brain?

New theory holds that a lack in man's body chemistry causes accumulation of brain stimulant, and this gave him an evolutionary push toward a larger brain.

► MAN OWES his superior brain to a lack in his body's chemical factory, Dr. E. Orowan of Massachusetts Institute of Technology has reported.

The "pressure-of-life" diseases, such as high blood pressure, stomach ulcers and mental breakdowns, may be due to this same chemical situation, Dr. Orowan suggested.

The chemical factory lack lets a powerful brain stimulant, uric acid, pile up in the blood of man. Though not as strong a stimulant as those in tea and coffee, it is strong enough, Dr. Orowan said, so that its effect over a million years of man's evolutionary development could produce man's superior brain.

Mammals are distinguished from other vertebrates and from insects by their ability to produce the enzyme uricase which oxidizes uric acid and helps to turn it into allantoin.

Among the mammals, only man in company with the higher apes is unable to manufacture uricase in the body. Uric acid is therefore found as a waste product in the urine of man.

Crystals of uric acid sometimes accumulate in the joints of some susceptible persons. This causes them to have gout.

Man, who eats a good deal of meat but who lacks uricase to help him get rid of the uric acid produced by the meat, is constantly under the influence of this powerful brain stimulant, Dr. Orowan said in reporting his conclusions to *Nature* (April 16).

This circumstance may have played a decisive part in the intellectual development of the apes and man.

It may also have led to the "pressure-of-life" diseases which Dr. Orowan thinks might better be called "pressure of uric acid" diseases. He points out that the stimulating uric acid can be more powerful than tea and coffee chemicals in preventing rest and recovery from work because its action extends over day and night. Since the populations of highly industrialized areas are big meat consumers, the consequent piling up of uric acid in the blood may account for "pressure-of-life" diseases being more frequent among them.

A mutation acting on the associative mechanism of the brain would not be likely alone to account for the momentous brain development in the evolution of man, Dr. Orowan explained.

The selective value of such a mutation would be very small unless the animal uses its brain even when it is not urgently necessary.

Such a tendency is very unusual in ani-

mals. Even modern man has, in general, "no irresistible addiction to mental work," he commented. Such a mutation would have little chance to become established in the species unless its selective value were strongly enhanced by a brain stimulant such as uric acid.

Millions of the present generation, Dr. Orowan pointed out, owe their careers and some their lives to caffeine or theobromine taken while cramming for an examination or during a long automobile drive.

Science News Letter, April 30, 1955

PUBLIC SAFETY

Heat or Cold Increases Danger of Radiation

► MIDSUMMER AND midwinter would be the worst times here in the United States for survival from the radiation of any future attack by A bombs, H bombs or other nuclear weapons.

Studies suggesting this were reported to the Federation of American Societies for Experimental Biology in San Francisco by Dr. John Doull and Andrew Hasegawa of the University of Chicago's Air Force Radiation Laboratory.

Rats exposed to killing doses of X-rays and then placed in artificial climates of 100 degrees Fahrenheit temperature and 50% humidity survived only 60% as long as rats living under normal experimental conditions.

The "hot room" rats survived for an average of six days, the other irradiated rats for an average of ten. Rats given lower, but still dangerous, doses of irradiation also survived for shorter periods of time and lost more weight than rats merely exposed to irradiation and not to the hot environment.

Six days after exposure to the radiation, the "hot-room" irradiated rats began to show an increase in body temperature. This fever did not develop in rats exposed to either heat or irradiation alone.

Science News Letter, April 30, 1955

MEDICINE

U. S. Uranium Miners Escaping Lung Cancer

► SO FAR as can be learned now, uranium miners in the Colorado Plateau will escape the lung cancers that killed so many European miners working with similar sources of radioactivity.

After five years of study of the hazards, no conclusive proofs could be found as yet

that the internal alpha radiation, ever-present in these mines, is a causative agent in lung cancer, J. D. Torrey, industrial hygienist, and P. W. Jacoe, chief of the environmental health services of the Colorado State Department of Health, declared at the Industrial Health Conference in Buffalo, N. Y.

"We do not anticipate a duplication of the European experience because we have a more complete understanding of the problems and of the steps that are necessary to reduce the exposure of men to these hazards," they stated.

Hazards in these mines in addition to internal alpha radiation are dust, uranium and vanadium as metals, miscellaneous hazards, such as fumes from diesel-operated equipment, and the combination of all four. The most economical way to control the hazards, they said, is by well-planned ventilation.

"Each mine, however, offers a unique problem from the engineering standpoint," they stated. "The problems are multiplied because of geographical location, lack of water, lack of electrical power, and many other shortages. Furthermore, the average number of workers per mine is three to four. Any mine employing 10 people is a large mine, and those employing over 25 can be counted on your fingers."

Science News Letter, April 30, 1955

PSYCHOLOGY

Reaction to Stress Is Linked to Disorders

► THE BODY has its own pattern for responding when faced with an unusual stress. This is tied up with tendency toward particular kinds of physiological disorders.

Dr. Peter M. Lewinsohn of Johns Hopkins University told the Eastern Psychological Association in Philadelphia what happened when three groups of people were put into two situations of stress.

In one, each individual had to plunge his feet into near freezing water. For the other situation, while taking a mental test, each was told repeatedly that he was failing and was "punished" by electric shocks on his leg.

A group consisting of duodenal ulcer patients responded with an increase in parasympathetic nervous activity. The flow of saliva under stress was higher for this group than for any other.

A group of patients with high blood pressure (essential hypertension) responded with an increase of sympathetic nervous activity.

For a third group, reaction to stress involved an increase in muscular tension. This group was very tense to start with, was restless and had trembling of the fingers.

An increase in tremor of the fingers developed under stress, and it affected all groups. The cold water test produced the greater increase.

Being badgered with "failure" produced a greater rise in heart rate than did cold.

Science News Letter, April 30, 1955