# behavioral sciences

## Immunity to marijuana

Heavy users of marijuana sometimes develop a pharmacological tolerance to the drug. The exact mechanism of the tolerance is unknown, but two facts have led to speculation that marijuana tolerance may be the result of an immune response in which the body produces antibodies to the drug. In rats and dogs, for instance, marijuana tolerance develops in about the same amount of time (five to nine days) an immune response would develop. THC, one of the psychoactive substances of marijuana, is also known to produce activity in the spleen that could be related to antibody production. G. G. Nahas, D. Zagury and Iris W. Schwartz of Columbia University and Marie-Daniele Nagel of the University of Reims in France have examined the possibility of such an immune response in rats. Results are reported in the June 15 NATURE.

In one set of experiments, an immunosuppressant (azathioprine) was given to rats prior to daily doses of THC. Tolerance to marijuana did not develop after the normal 6 days and was still absent after 13 days. The spleens of THC-treated rats were examined and the activity found there was similar to that induced by immunity producing substances.

## Environmental control and anxiety

A feeling of helplessness, resulting in anxiety, sometimes overtakes persons who believe they have no control over their environment. Psychologists have suggested that this anxiety may begin early in life if an infant finds that the world does not respond to its actions. To test this theory, J. M. Joffe, Richard A. Rawson and James A. Mulick of the University of Vermont in Burlington examined the effects of environmental conditioning on young rats.

Rat pups were reared from birth in one of two environments. Those in the controlled environment learned very early to get food, water and light by pushing levers. Rats in the uncontrolled environment had levers that did not work. These rats received food and water only when those in the other cage ordered it. After two months of this conditioning, when the rats were adults, the researchers tested them for emotional stability or anxiety. The test consisted of monitoring activity and defecation when the rats were removed from their cages and placed in an open area. In the June 29 SCIENCE the researchers report that the rats reared in the controlled environment displayed less emotionality. They defecated less often and were more active than the rats raised in the unresponsive environment.

## Vitamin B and alcohol

In the past 20 years, reports have been made claiming that large doses of vitamin B have a sobering effect when given before or during periods of alcoholic intoxication. A group of British scientists have attempted to duplicate these studies. They report in the June QUARTERLY JOURNAL of STUDIES ON ALCOHOL that they were unable to do so.

Eight volunteers took part in experimental sessions at which they were given enough alcohol to produce mild intoxication. They were given either vitamin or dummy tablets before the drinking began. Blood and urinary samples were taken at intervals during the experiment as were psychological, self-evaluation, muscular response and mental ability tests. Grainger Muir, Norman Pollitt and John Rooney conclude that oral pretreatment with vitamin B had no significant biological or psychological effect on subjects given an intoxicating amount of alcohol.

# biomedical sciences

## Electrical relief in the dental chair

Electrical blocking of nerve impulses is not new. But it is now being used to relieve pain from dental work. The instrument, which is of Russian design and marketed by West Germany, is taking Europe by storm.

The instrument is based on sound physiological principles, P. P. Newman, a British neurophysiologist, reports in the June 22 NATURE. He predicts that it may become the method of choice for treating children, nervous patients and pain-sensitive patients.

Newman recorded the nerve impulse made by a frog nerve. Then he applied current from the dental instrument to the nerve. The current turned off the nerve impulse. When the current was switched off, the nerve could again make an impulse. Since nerve impulses cause pain, Newman is convinced that the current from the instrument can prevent dental pain.

Before a nerve makes an impulse, its membrane must be permeable to ions. The depolarized (locally disturbed) membrane then initiates a local flow of current that becomes the nerve impulse. Newman believes that current from the dental instrument may restore polarization of the membrane. That way ions can no longer get through the membrane, the nerve impulse is arrested and pain is prevented.

## Plants get high on oxygen

If plants are exposed to levels of oxygen that are lower than those in the atmosphere, they are known to grow more. Such knowledge might be exploited to step up the growth of soybeans, which are in short supply and a major factor in presently rising food costs. There is a catch, though. Long-term exposure to subatmospheric levels of oxygen reduces soybean reproduction, and subsequent soybean harvests. This finding is reported in the June 22 NATURE by plant scientists from the DuPont Co.

They exposed soybeans to 5, 10, 15 or 21 percent (atmospheric level) oxygen from 14 to 83 days. They found that the plants developed thicker leaves, thicker stems and especially longer roots than regular soybeans. But their number of fully developed pods and seeds was decreased by all subatmospheric levels of oxygen. So at the time of normal maturation, there were neither completely developed pods nor seeds for plants exposed to 5 percent oxygen. Only 53 percent of the plants in 15 percent oxygen developed seeds. The scientists got similar results with wheat.

## A molecular cousin of ice

The molecular structure of ice and the molecular structures of anti-inflammatory drugs are in many ways similar, Donald T. Warner of the Upjohn Co. has found. His discovery may enable medicinal chemists to predict molecular structures that will act against rheumatoid arthritis, gout and other inflammatory disease.

Warner used a network of balls and rods to simulate positions of hydrogen and oxygen atoms in ice. He then made similar molecular models of anti-inflammatory agents and fitted them to the ice model to test correlations. The most vital parts of the ice model were three oxygen atoms arbitrarily called 3, 11 and 17. These are location numbers of vital functional groups of atoms in hydrocortisone, a steroid used in anti-inflammatory therapy. Two or three of positions 3, 11 and 17 of the ice model were also found to match functional atomic groups in aspirin and other nonsteroid anti-inflammatory drugs.