

While he never names his subject, he describes him as a 37-year-old male patient "with adrenal insufficiency due to Addison's disease," who underwent elective surgery.

"Owing to a back injury," the anonymous subject "had a great deal of pain. . . . Orthopedic consultation suggested that he might be helped by lumbosacral fusion together with a sacroiliac fusion."

"Because of the severe degree of trauma involved in these operations and because of the patient's adrenocortical insufficiency due to Addison's disease, it was deemed dangerous to proceed with these operations. . . .

"It was decided, reluctantly, to perform the operations by doing the two different procedures at different times if necessary and by having a team versed in endocrinology and surgical physiology help in the management of this patient before, during and after the surgery."

Dr. Nichols found that the surgery described by Dr. Nicholas and his co-workers matches closely that performed by Drs. Wilson, Nicholas and others on Senator Kennedy.

And his check, and independent checks as well, have turned up no other 37-year-old male patients who underwent spinal surgery at the Hospital for Special Surgery on the day in question. Dr. Nicholas's unnamed subject, it seems, has to be the late President in whose surgery Dr. Nicholas assisted.

Dr. Nichols, in reopening the old controversy in the July 10 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, denies that he is violating medical ethics in publishing his results and conclusions.

"It may be argued," he declares, "that a breach of physician-patient relationship would result if physicians with direct professional knowledge of President Kennedy's illness made public comment without consent." (Drs. Nicholas and Wilson have both declined comment.) But, he adds, deploring the silence on the question by the Kennedy autopsy report, "The public is entitled to knowledge of the health of (its) chief executive and candidates for this office."

The information, he declares, should have been made public initially.

NUCLEAR REACTORS

Five-year Test in One

While concentrating on the third generation of advanced nuclear reactors, the so-called breeders, (SN: 4/15) U.S. and European atomic energy agencies continue to push research in the

less exotic levels of reactor technology. Both efforts seek new developments in fuel element technology.

The U.S. research is highlighted by the recent start-up of a high-power Advanced Test Reactor at the Atomic Energy Commission's Idaho Falls Testing Station. The ATR, designed to put out 250,000 thermal kilowatts of energy, will be used to test the effect of irradiation on fuel elements and shielding material.

The reactor elements are in the shape of a cloverleaf with four lobes.



Cloverleaf reactor goes critical.

In the center of the lobes are nine tubes to hold test samples. Each tube can run as an independent unit, with its own pumps, heaters and other special equipment. This allows a number of materials to be tested under different conditions simultaneously. Three of the lobes are cooled with water; the fourth lobe, not yet completed, will be gas cooled.

Neutron irradiation is a serious problem when designing reactor units. When a uranium 235 atom is split by a neutron, it gives off heat and also more neutrons. Some of these go to split other U-235 atoms, but others are absorbed by the reactor core and the fuel element container or cladding.

The ATR provides a way of speeding up the testing of reactor materials. If a fuel element is designed to last five years in an ordinary reactor, it will have to undergo an equivalent irradiation in test to show that it can stand up. Since the ATR provides something like a hundred times the concentration of neutrons that a typical power reactor puts out, a five-year test could be carried out in less than a year, according to Dr. E. E. Sinclair of the AEC's reactor development and technology division.

The ATR is a source of slow-moving, or thermal, neutrons, such as are

used in most present-day reactors.

The advanced breeder reactors, however, use neutrons that move much faster, and these will present more serious irradiation problems. Dr. Sinclair says the ATR can be used for "screening" materials for fast neutron use, but most tests of such elements will have to be carried out in the Commission's Fast Flux Test Facility, which is being built near Richland, Wash. Test results from that station are not expected until about 1975.

In Europe, tests of a new type of fuel element showed promise of improving the efficiency of present-day boiling water reactors. One problem with this type of reactor is that the water, which is circulated past the fissioning fuel to take off heat with which to drive electric generators, tends to form vapor bubbles around the fuel elements. These bubbles insulate the surface and trap the heat within, so that it isn't available to do work.

The advanced fuel assembly, developed by the French firm, SNECMA, consists of metal bands twisted between the fuel rods in the assembly. These twisted tapes have a vortex-effect on the flow of water which, says the European Atomic Energy Community (Euratom), could double the power produced with the same amount of coolant in an ordinary reactor.

One problem with adding more material to the reactor core, say U.S. experts, is that there is just that much more material to wear out in a critical area. But after a six-month test in Euratom's Kahl nuclear power plant near Frankfurt, West Germany, the new fuel-element assembly still seems to be in good shape.

PHARMACOLOGY

The Real STP

The men at the microscope and the men in the clinics seemed to be talking about different things. Each had identified an STP that didn't seem to fit the other's description (SN: 7/15). Now that the dust stirred up by the dangerous hallucinogen has settled, the men in the laboratory appear to have prevailed.

Last week, the Food and Drug Administration completed its analysis, and concluded:

STP is a new, untested drug, resembling both amphetamine pep pills and the active ingredient in mescaline, the cactus-derived mind-bender.

In California, where a dozen users had been hospitalized with three-day mania and an array of physical side-effects, Dr. Frederick H. Meyers, who had treated patients for STP highs, reluctantly abandoned his original sup-

positions: "I think we have to go along with this, although it certainly doesn't fit our expectations," he says.

No information on the drug's toxicity, specific action or medical value is available, says the FDA; "drug experts consider its use extremely hazardous."

STP samples analyzed by the FDA were named methyl dimethoxy methyl phenylethylamine, which seems to be, more than anything else, a kind of super hallucinogenic pep pill. Usually the amphetamines produce hallucinations only when taken habitually. Also their action is shorter and less intense than STP effects seen in California.

STP confused the investigators when it suddenly appeared among San Francisco hippies last month. Users began landing in the hospital with symptoms which suggested the nerve gas, BZ, or some compound like it.

Dr. Meyers, a professor of pharmacology at the University of California Medical Center, believed STP was one of these compounds, called the anticholinergic drugs, whose mental effects include long-lasting mania, hallucinations, considerable fear and confusion. But FDA officials could not find any such compounds in their STP samples.

Dr. Meyers says the FDA has identified a drug that is new in more ways than one. It's new to have a single dose of this kind of drug produce such intense effects, he says. "It's also new for it to be intensified by chlorpromazine"—the tranquilizer usually given to arrest an LSD reaction. Used on the STP patients, chlorpromazine only made their condition worse, not the expected result with mescaline or a pep pill.

Dr. Meyers, disconcerted, is willing to accept the FDA's chemistry.

OPERANT CONDITIONING

'Gross' but Appropriate

Animals, whether dogs, apes, rats or humans, learn through a system of payoffs and punishments. There is nothing new about the process—one simply learns to do those things that bring in positive returns.

But psychologists a few years ago labeled the process "operant conditioning" and began employing it deliberately in psychiatric treatment. In so doing they parted with the Freudians and worked with behavior instead of feelings.

Though operant conditioning is having a serious impact on psychiatric theory, its use in the United States is still rather limited, the general professional attitude being: "All right, so you have some trained seals, now what?"

Advocates reply: First improve the behavior and emotions will follow,

changed by feedback from the environment.

The trick in operant conditioning is to choose the right system of rewards and punishments, not to mention the right behavior. U.S. psychiatrists hesitate to use punishments any more serious than a demerit or minor electric shock in observance of the medical dictum that a doctor should not harm his patient.

But one American psychiatrist, working last summer in South Vietnam, decided he could not afford that dictum. Faced with 2,000 mental patients stagnating without treatment in the Bien Hoa Mental Hospital, Dr. Lloyd H. Cotter of Santa Ana, Calif., chose the most effective conditioners he could find and used them.

The goal was to get the patients "out of their fetal positions" and working in the fields, raising food for themselves and the hospital while improving their mental health. The means were wholesale applications of electric shock therapy and hunger.

"If you don't work, you don't eat," Dr. Cotter told the most resistant patients who didn't respond to the shock therapy. After three days without food, they were working.

Within two months, Dr. Cotter, with the aid of his Vietnamese colleagues, had 1,000 patients in the fields. As soon as a patient agreed to work, Dr. Cotter switched to rewards, paying out small sums of money and setting up a patient's store.

The net effect, says Dr. Cotter, was a basic improvement in mental health. Patients became more alert, cleaner and better able to deal with reality. Instead of half the ward being naked all day, patients were dressed and productive.

Some may say this was cruel treatment, but "if it works and it helps the patient, it is not cruel," Dr. Cotter maintains. "Inflicting a little discomfort to move patients out of their zombie-like states of inactivity, apathy and withdrawal was, in our opinion, well-justified."

And other psychiatrists, viewing his program from the United States, agree.

"If people are rotting in the hospital and two weeks later, they're working in the fields, the only pragmatic answer is, yes, he was justified," says Dr. Arthur Colman, a research psychiatrist who is running an experiment with operant conditioning at the Walter Reed Army Medical Center in Washington, D.C.

"Maybe he shouldn't have the right to dole out that kind of punishment. . . . I don't have such control and wouldn't want it," says Dr. Colman. "But I don't know what else he could have done."

When Dr. Cotter arrived at the

hospital last summer as a medical volunteer, he found three doctors, almost no drugs and a handful of aides. The patients were dying at a rate of one a day from disease and lack of decent food.

"In this frightful situation, I would be all in favor of Dr. Cotter's approach," comments Dr. Zigmond Lebensohn, head of psychiatry at Sibley Memorial Hospital in Washington. "It would have been so easy for him to do nothing." Dr. Lebensohn, however, questions whether the Vietnamese work program should be called operant conditioning.

Curiously enough, Dr. Cotter is probably less likely to be criticized for withholding the patients' food than for running so simple and direct a program. Professionals in operant conditioning might say the whole approach was "terribly gross," says Dr. Colman.

ASTRONOMY

Naked-Eye Nova

A rather rare astronomical event, a new star blazing forth visible to the unaided eye, was spotted on July 8 by an English observer, G. E. D. Alcock of Peterborough, who estimated its brightness as magnitude five.

Confirmation of the sighting was made by M. P. Candy of the British Astronomical Society, who reported the magnitude as near the limit of visual observation.

Within hours, a cable concerning the discovery was received at the Smithsonian Astrophysical Observatory in Cambridge, Mass. Astronomers there immediately alerted U.S. observatories, some by telephone, so that additional confirmation was available the same night as the original observation.

R. E. Zissell, a Yale University research associate, was the first in this country to take the nova's spectrum. The nova, now fading, is at right ascension 20 hours, 40 minutes; declination plus 18 degrees, 55 minutes. He also estimated its brightness as close to sixth magnitude.

The new star is the first bright enough to be seen without optical aid since 1963, as well as the first of any magnitude spotted this year. It is in the constellation of Delphinus, the dolphin, a collection of faint stars directly south of the center of the Northern Cross.

Photographs taken before the July discovery show no star brighter than the sixteenth magnitude in the nova's position. Astronomers are determining exactly how fast the new star is fading but they expect it to be visible through binoculars until early August.