

compensate for the loss, more basic questions involving the nature and future of the unmanned missions were being raised.

Only one spacecraft, not two, is being built for the Mariner Mercury-Venus flybys in 1973. This is largely due to financial limitations, although recommendations to NASA have been made that duplicate missions not be pursued unless the two craft perform different functions.

The other alternative to insuring success of a given mission would be to build the unmanned spacecraft as delicately as manned spacecraft are built—with redundant systems in case of failure. In space jargon this is called “man-rating” a vehicle. In addition to larger boosters needed for the weight of duplicate systems, however, such a procedure requires much more time and money. “Whether this is a wise thing to do,” says Dr. James C. Fletcher, the new Administrator for NASA, “involves making a trade-off between that and the money that you lose from a failure.” Mariners 1 and 3 failed as did two of the seven Surveyors. All five lunar orbiters, however, were successful. □

When the manned space shuttle is built, it would carry craft such as the Mars orbiter to earth orbit where the craft would then propel itself on to the planets. Unmanned launch failures might then be a thing of the past.

NSF BUDGET

RANN gets rundown

The National Science Foundation's proposed budget for fiscal 1972 not only provided more total funds for the agency but also called for a certain shift in priorities (SN: 2/6/71, p. 94). Apparently in response to a growing body of opinion that scientific research should be directed toward solution of current social, environmental and health problems, NSF proposed a substantial increase in its support of applied research projects. The increase came at the expense of direct student and postdoctoral support and institutional science programs.

The total budgeted for national and special research programs, \$166.6 million, was double the 1971 amount. Of this, \$81 million came under the heading of Research Applied to National Needs (RANN), the Foundation's new program for the funding of applied research in such fields as earthquake engineering, enzyme technology, energy resources and weather modification. At the same time, institutional support for science was cut from \$34.5 million to \$12 million and science education support, including student fellowships and traineeships, was cut from \$100.6 million to \$77.3 million.

The House Committee on Science and Astronautics, the first of the four Congressional committees that must screen the NSF budget, has now rearranged the priorities, shifting some budgetary support back to educational and institutional grants. The over-all budget total of \$622 million remains unchanged, but the committee has cut RANN to the tune of \$30.6 million and shaved off \$11.7 million worth of scientific research project support. The money was redistributed, with an additional \$22 million for science education support, \$16.8 million for institutional support for science and \$3.5 million for specialized research facilities and equipment.

There were two basic reasons for the shuffle in funds. On the one hand, the committee apparently felt that, for an experimental program, RANN was expanding too rapidly. Dr. Philip Handler, president of the National Academy of Sciences and a member of the National Science Board, told the committee during hearings that he viewed RANN as “a large experiment,” and contended that its predecessor, Interdisciplinary Research Relevant to Problems of Society (IRRPOS) had been none too successful. “Today, one cannot make any great claims that it has really solved a major problem which is pressing on our society.”

On the other hand, there was a great deal of dissatisfaction with the cuts in educational support. Congressmen had received numerous complaints from the educational community and the general public. In fact, one committee spokesman said practically everyone was unhappy with the NSF budget. “The only one satisfied with it was the NSF.”

In making its budget proposal NSF emphasized the importance of increasing the understanding of society's problems and played down the educational and institutional cuts. The reallocation in funds, the agency argued, would not really result in an actual reduction in expenditures for science education and institutional programs. The increase in research projects would, according to NSF head Dr. William D. McElroy, “provide for the training of many science and engineering graduate students through employment on research projects.” In addition, he said, NSF research programs would be conducted primarily through colleges and universities.

From the committee's point of view, there was also a question of labeling and of maintaining Congressional control over expenditures. Though the NSF plan would probably provide some support for students, there was no real assurance of how much. “It's hard for Congress to control how money is spent unless it's labeled properly,” explained a committee spokesman. □

HEROIN ADDICTION

Finding partial solutions



Dept. of Justice

Complete withdrawal won't be easy.

The horrors of heroin addiction are becoming increasingly evident as the problem takes on epidemic proportions in its rapid spread throughout the United States. Formerly clean cities in the Southeast and Midwest and affluent suburbs everywhere are feeling the effects. Dr. Bertram S. Brown, director of the National Institute of Mental Health, told a Senate subcommittee on narcotics last week that there are not 125,000 but 250,000 heroin addicts in the country. Some experts even double this figure.

The physical and psychological effects of addiction and the cost of supporting the habit make the heroin problem even more severe than other forms of drug abuse. The user becomes hooked. He develops a tolerance to the junk and needs increasing amounts until the drug becomes the center of his life. Apathy and reduction of hunger physically deplete him, and pneumonia, tuberculosis and venereal disease are easily contracted. Bad drugs or unsterile needles cause hepatitis and other blood infections. In 1969 in New York City 900 people died of overdoses of heroin. Of these, 200 were teenagers.

Psychologically the junkie is worthless to himself and to society. He can't stay in school or hold down a job. Preoccupation with obtaining drugs keeps him in constant trouble with his family and the law. New York City addicts had to steal \$10 billion last year to support their habits.

This personal and sociological decay lend urgency to the problem and have forced authorities into half-way solutions. Of these, methadone treatment is the most successful (SN: 4/12/69, p. 364). Methadone, an inexpensive synthetic material similar to heroin, is used to help addicts detoxify.

It blocks the effects of heroin and helps curb the physical and psychological craving for drugs. In most cases, addicts maintained on methadone are able to lead productive lives. Dr. Robert L. DuPont, head of the Washington, D.C., Narcotics Treatment Administration, claims an 83 percent decrease in arrests among 150 methadone-treated heroin addicts. Unfortunately this drug also is addicting if used over a period of time.

The latest attempt to find a partial solution to the heroin problem involves a non-addicting, non-narcotic chemical called haloperidol. Research results showing its usefulness in treating addicts were reported this week at a meeting of the Behavioral Pharmacology Society at Bryn Mawr College in Pennsylvania by Dr. Harbans Lal, professor of pharmacology and toxicity at the University of Rhode Island, and Dr. Yani Karkalas, assistant chief of psychiatric services at the Rhode Island Institute of Mental Health in Kingston.

Experimenting with morphine-addicted rats, they discovered that haloperidol relieves the anxiety and agitation associated with withdrawal or detoxification. Administering small dosages of the drug to heavily addicted patients three times a day, they found that relief from even severe withdrawal symptoms could be obtained. Only 10 users were treated; five of them experienced complete relief. Four were not helped at all. The researchers explained that those not helped were extremely heavy users who had been taking from 25 to 30 bags a day. The others had been using 10 to 20 bags. They believe that even the heavy users can be helped with higher doses of the drug, but this was not attempted due to fear of side-effects.

Haloperidol was first introduced in Europe in 1959. It was licensed for sale in the United States in 1967, and is sold by McNeil Laboratories under the trade name Halodol. Physicians use it as a major tranquilizer to treat a variety of psychotic disorders. Dr. Harold Conrad, chief of clinical research at NIMH's Addiction Research Center in Lexington, Ky., says "we are aware of the drug but know of no magical properties it possesses." He explains that, like any other major tranquilizer, it can do "no more than mask withdrawal symptoms. We routinely use methadone." A researcher at NIMH says the Rhode Island group's findings could be important but must be taken with a grain of salt because the sample is too small.

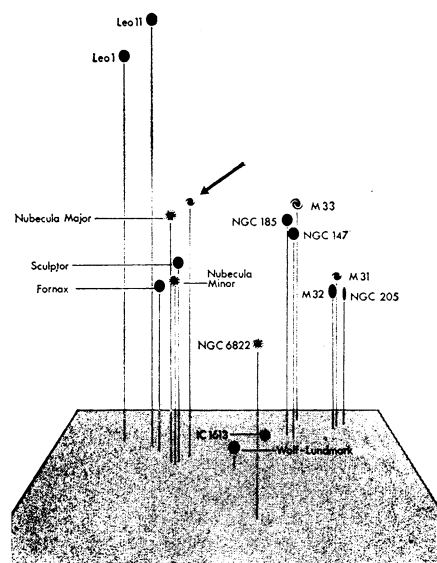
Dr. DuPont views the results as a non-finding. "Treatment of withdrawal is a trivial problem and can be achieved in some cases with a placebo." The withdrawal problem, he feels, does

not bear on the long-term goals of rehabilitation. The chronic heroin addict must be psychologically cured of his habit as well as physically cured.

Drs. Karkalas and Lal realize the scope of the problem and cautiously state that their findings are preliminary. They intend to continue testing with similar drugs and to monitor long-term effects. They do not contend they have solved the problem of addiction, but they are optimistic. "Our primary interest at present is to gather much more data on this very promising drug," says Dr. Lal. □

MAFFEI GALAXIES

In the local group or out?



Courtesy Rand McNally Atlas of the Universe
Local galaxies: Arrow at Milky Way.

Galaxies tend to associate with each other in groups. As more and more distant galaxies were discovered and catalogued their tendency to exist in clusters became apparent. The clusters are not merely apparent but real; the galaxies in them are roughly the same distance from earth.

Our galaxy, the Milky Way, belongs to a similar cluster. Since the local group of galaxies is all around us, it is much harder to visualize than a distant cluster that appears compactly in the sky. The local group has about two dozen members, including the spirals M31 (Andromeda), M33 and our galaxy; the two Magellanic Clouds (satellites of our galaxy); and smaller elliptical and irregular systems.

Setting a bound to the extent of the local group is a somewhat arbitrary procedure, and measurements of the distances of near galaxies are uncertain up to a factor of two. For these reasons uncertainty and discussion have arisen among astronomers over whether the two newly discovered galaxies, Maffei 1

and Maffei 2, are members of the local group or not.

Maffei 1 and 2 were first noticed on infrared photographs of a part of the sky heavily obscured by interstellar dust. A few months ago a group led by Dr. Hyron Spinrad of the University of California at Berkeley pointed out the galactic appearance of the Maffei and suggested they might be members of the local group (SN: 1/16/71, p. 42). The arbitrary boundary set for the local group is one megaparsec or 3.6 million light-years from our own galaxy; the distances determined for the Maffei galaxies by Dr. Spinrad's group appeared to be less.

Dr. Sidney van den Bergh of the University of Toronto thinks the Maffei objects are not part of the local group. In a letter in the May 7 *NATURE* he associates the Maffei galaxies with the galaxy IC342, another whose membership in the local group has been considered questionable, and says that all three are "a little outside our local swimming pool." The argument is based on the fact that Maffei 1 and IC342 appear only 12 degrees apart in the sky and are receding from the earth at nearly the same velocity, which would put them about the same distance away. These circumstances suggest an association among the three objects and a common distance of about two megaparsecs.

In addition, says Dr. van den Bergh, a group of French radio astronomers has data on the rotation of Maffei 2, not yet published, that also indicate the larger distance.

"It's a possibility," replies Dr. Spinrad. "There's plenty of doubt on the distance and we tried to indicate that in our paper, but I guess most people just jumped on the bandwagon and assumed they were members of the local group."

The Maffei galaxies are not visible now from California, but they will be in September and October. At that time Dr. Spinrad plans to look at them in the light called hydrogen alpha to see if he can find clouds of ionized hydrogen in them. Since ionized hydrogen clouds have a relatively narrow range of sizes, the apparent sizes of any that can be found in the Maffei galaxies could give a good measure of their distance.

One of the problems of determining what is and isn't in the local group is that astronomers can't prove what holds it together. They believe it must be gravity, but for the group to be stable there must be a lot more mass in the group than there appears to be. "We just don't know the answer to that mystery," says Dr. van den Bergh. Until gravitational stability among the group can be proved, the only criterion for membership remains the arbitrary one of distance. □