Dean saw beginning of Air Force experiments for space program

By MYRA GREGORY KNIGHT
Staff Writer

Astronauts escape and re-enter the earth's atmosphere so easily now that we tend to forget how uncertain it once was that human beings could even survive a rocket launch.

But Dr. Stuart Bondurant, dean of the UNC School of Medicine, remembers. He joined the space effort in 1956, when the Atlas missile was new.

Powerful enough to escape the earth's atmosphere, the missile suddenly placed the prospect of space travel within the realm of reality.

"Scientists began wondering how riding a missile would affect man," Bondurant recalled.

To find out, the U.S. Air Force began conducting acceleration tests with a centrifuge, a machine that could simulate the effects of strong gravitational forces.

Bondurant, then an Air Force cardiologist, was asked to determine how well the human heart could withstand those forces.

Working at Patterson Air Force Base in Dayton, Ohio, he and his scientific colleagues did some research that helped to make history — they determined that human beings were fit to travel in space.

"Our purpose was to set the outer limits," Bondurant said. "All we did was provide some reassurance as to what man would be able to tolerate."

The tests were rigorous, Bondurant said. Some of them took place under forces of acceleration equal to 14 times the pull of gravity.

But even in extreme circumstances, the body proved to be amazingly

When acceleration pushed internal organs out of their natural positions, the organs later moved back on their own, he said. And when the heart strained to keep circulation normal, the veins in the arms and legs worked harder to help ease the load.

Acceleration effects on the lungs probably caused the greatest concern, Bondurant said. As pressure increased, the lungs responded by stiffening, making breathing more difficult.

But under test conditions, he said, the body revealed yet another means of compensation — breaths became shorter and more rapid, permitting survival.

Bondurant noted that much of the early acceleration data was recorded with the "astronaut," or human subject, under water.

The buoyant forces of water were used to counterbalance the strong forces of acceleration that scientists considered unavoidable in a rocket launch, he said.

Fortunately, the development of better rocket fuels later made submersion of the astronaut unnecessary, Bondurant said. The first space rockets were able to escape the earth with considerably less acceleration than the experts had thought.

Today's astronauts experience a force of acceleration only four or five times the force of gravity, he added.

But just for the record, tests conducted by the Air Force's research team established that humans can tolerate forces three times stronger for as long as two minutes.

"The message was, if you needed to go as high as 14 g, it was possible," Bondurant said.

Lake may be contaminated despite UNC study

By TRACY HILTON
Staff Writer

The favorable report concerning the B. Everett Jordan Lake study conducted by scientists at UNC has not addressed all possibilities of contamination, according to other water experts.

David H. Moreau, chairman of the Cane Creek Reservoir project, said in a *Durham Morning Herald* article March 22 that the report "does not address the most important of the current issues relevant to its used for drinking water — contamination from synthetic organic materials."

Dr. Charles M. Weiss, professor of environmental biology at the UNC School of Public Health, who directed the research, said that state-level tests detected no evidence of any contamination from synthetic organic materials.

Weiss said that if tests proved favorable, the quantities of synthetic organic material contamination would probably be in "parts per billion," which is so small that it would not be harmful to humans.

The term "parts per billion," he said, is the same as a pinch of salt in 10 tons of potato chips or a bad apple in two million barrels.

Because of a controversy that predicted poor quality of the impounded waters, Weiss and his colleagues, Donald E. Francisco and Peter H. Campbell, lecturer and research associate, respectively, in the School of Public Health, had been monitoring microscopic plant life, heavy metals, bacteria and mineral nutrients in the 14,000-acre lake area since Feb. 1982, when the reservoir reached full pool level behind the B. Everett Jordan Dam.

The purpose of the research was to assess the impact of the high nutrient flows entering the lake from inflowing streams and the Haw River, the quantities of heavy metals that might influence the use of the water for water supply and its sanitary quality with respect to its use for recreational and municipal purposes, the report stated.

"During the first year after filling, Jordan Lake was quite unusual with high levels of algae, and it appeared as though predictions of horrendous algal blooms were about to come true," Weiss said. "During the second year, however, algal growth declined substantially, and the lake is currently more similar to other Piedmont reservoirs than to the predictions."

Clumps of algae visibly floating in the lake for a short time during May 1982 were largely the result of nutrients from newly flooded soil and plant debris left on the lake floor, he said. Heavy rains have since washed out much of the nutrients and algae, bringing about the improved conditions observed during 1983.

Systematic sampling and a careful program analysis were carried out to establish the presence and quantity of 12 heavy metals. The tests uncovered no significant problems.

A state Division of Environmental Management study, released in January, showed that fish caught in Jordan Lake contained little if any mercury and other metals, he said. "Jordan Lake is one of the best bass fishing lakes around," Weiss added.

Weiss' samples of bacteria and other microorganisms associated with wastewater treatment and runoff also showed Jordan Lake to be satisfactory for both water supply and recreation.

Bacteria counts at recreational sites and in the Haw River arm of the reservoir tended to be higher than in mid-lake, but were still consistently below maximum levels established by North Carolina regulations.

"While the flow into Jordan Lake has the highest proportion of point source wastewater flow of any North Carolina reservoir, the health-related pollutants did not indicate any reason for concern," the report stated.

The Jordan Lake project dates back to 1945 when many dams were built to resolve a flood of the Cape Fear River in Fayetteville, Weiss said.

OWASA board calls for ban on some phosphate detergents

By DEBORAH SIMPKINS
Staff Writer

The Orange Water and Sewer Authority Board of Directors unanimously supported a resolution last Thursday night for a statewide ban on phosphate-based laundry detergents. The ban, called the Clean Detergent Bill, will be presented to the North Carolina General Assembly by the North Carolina Department of Natural Resources and Community Development, said Pat Davis, systems development manager for OWASA.

The OWASA board approved the resolution because of concern with the nutrients present in B. Everett Jordan Lake and because the DNRCD study showed benefits from a phosphorous ban with minimum costs.

Phosphorous is a nutrient necessary to support life, Davis said. However, he said, excess quantities of phosphorous stimulate an excess growth of algae. When the algae dies, it is broken down by bacteria, he said. Bacteria uses up oxygen in water which results in fish kill, Davis said.

Besides the gradual deterioration of water life, Davis said, phosphates cause a taste and odor problem in water supplies. Chemicals must then be added to combat the taste and odor, he said.

The DNRCD study indicated 59 percent of the phosphates discharged into Jordan Lake came from waste water treatment plants, Davis said. Of that 59 percent, he said, 50 to 70 percent came from laundry detergents.

Davis said the Soap and Detergent Association, which opposed the ban, claimed phosphate detergents cleaned better, cost less and provided less wear and tear on clothes and washing machines. However, Davis said, there "really isn't that much difference in non-phosphates (detergents) as far as cleaning power goes." In addition, he said Purex, a detergent manufacturer which withdrew from the Soap and Detergent Association, makes both phosphate-based and phosphate-free detergents. Davis said Purex submitted a report to the DNRCD refuting the claims made by the Soap and Detergent Association.

Detergents such as Dynamo, All, Purex, Wisk and Era are phosphate-free, while Tide, Fab, Cheer, Bold, Cold Power and Gain are phosphate-based. All liquid, hand dishwashing soaps are phosphate-free, Davis said, but OWASA was not aware of any phosphate-free detergents for automatic dishwashers.

Six states now have clean detergent bills: Wisconsin, Minnesota, Indiana, New York, Michigan and Vermont.

The OWASA directors also went into executive session to discuss Cane Creek land acquisition. Executive Director Everett Billingsley said the session was to update the board on the negotiation of the remaining tracts.

"We have bought 40 parcels (total) and we have about eight to 10 remaining," he said. "We did buy an eight-and-a-half acre tract this past week." Billingsley said OWASA has bought three other tracts since the Stanford property acquisition in October.

OWASA is attempting to obtain enough property to build a reservoir for the town of Chapel Hill. Chapel Hill presently has one water source, University Lake, which pumps out about six million gallons a day. The lake was designed to serve only three million gallons a day. Cane Creek would produce an additional 10 million gallons of water a day for the town.

Although the 267-acre Stanford property will be the main site for the dam, OWASA still needs 267 acres for the reservoir, Billingsley said. In October of 1983, OWASA was given the right to seize property by the state Environmental Management Commission.

"We are making every effort to come to mutual terms with the remaining property owners," Billingsley said, "and I feel very optimistic (that we will)."

If, however, a stalemate appears in the negotiations, he said, "we will use the power of eminent domain granted to us."

Apartment waiting lists build

By MIKE GUNZENHAUSER
Staff Writer

For students closed out of residence halls in the housing lottery Feb. 27, there is still plenty of time to find apartments in the Chapel Hill-Carrboro area. Managers of most local apartments will virtually guarantee apartments to qualified applicants.

Students can also expect rents to increase in the fall. Most increases, however, do not amount to much more than the steady rate of inflation.

Pattie Woods of Foxcroft Apartments said that students' chances right now of finding a space there were very good. She said that Foxcroft was beginning to survey its residents to determine the number of vacancies they will have in the summer and fall.

Woods said that Foxcroft's rent increases for next year were next to nothing. "We don't anticipate any in the future either," she said. Almost all of Foxcroft's residents are students.

Manager Brent Bobbitt said that Booker Creek, Kingswood, University Lake, Estes Park and Royal Park still provide good chances for occupancy to students. Bobbitt said that most of these apartments would not have rent increases for next year. About 99 percent of those apartments are rented by students.

Town House Apartments has 120 applicants on its waiting list. Manager Mary Williams said that not many of those can expect to have an apartment there. She said that she can never be sure how many will eventually be placed. Rent increases between $10 and $25 will go into effect at Town House soon.

Sophomore Kathy Keller, a resident of Bolinwood Apartments, said that her rent had increased slowly but steadily over the past year. Keller said she expected her rent to increase by no more than $10 a month in the fall.

Most apartment managers said that waiting lists for occupancy in the early summer are considerably shorter than those in the fall and offer students a better chance. Space for the fall is still available, however, and managers advise students to act as soon as possible to increase their chances of finding a place to live off-campus.

New German class on business

Business German will be a seminar-style class conducted in German for students who have had German 4 or the equivalent. Topics such as economic geography, labor relations, marketing, banking, management, information technology and foreign trade will be covered.

The goals of the course are to become familiar with the business world in the Federal Republic of Germany, to develop a business vocabulary in German, and to become aware of differences between business and industry in West Germany and the United States.

For information, contact Valerie D. Greenberg, assistant professor in the Department of Germanic Languages at 966-1641.

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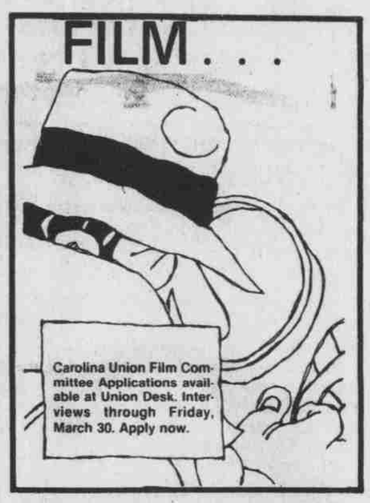

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