Protesters prompt halt in animal research

Health and Human Services Secretary Margaret Heckler last week ordered the National Institutes of Health (NIH) to suspend funding for research on baboons at the University of Pennsylvania's Head Injury Clinical Research Center in Philadelphia after she read a preliminary NIH report on animal treatment there. The report's early release to Heckler and NIH Director James B. Wyngaarden was provoked by animal rights activists, scores of whom occupied NIH offices in Bethesda, Md., for several days last week to publicize the plight of the baboons.

The suspension specifically halts the work of neurologist Thomas Gennarelli, whose funding constitutes about one-fifth of the center's budget this year, and one-ninth next year. Gennarelli is trying to develop a reproducible experimental model of head injury in the baboon. He is studying head injuries' effects on the brain in order to understand what happens to human heads in automobile and other accidents. Head and neck injuries are the No. 1 cause of death among persons between 1 and 40 years of age in the United States, according to NIH officials.

In their experiments, Gennarelli and his colleagues put baboons' heads through a rapid acceleration that produces severe brain damage similar to that seen in human accident victims. The baboons wore helmets to prevent the complications of skull damage.

In a statement issued last week, Wyngaarden said that according to the preliminary report, Gennarelli's lab failed to comply with public health policy for the care and use of laboratory animals. The statement included special references to lack of adequate anesthesia and analgesia for the baboons, sterile technique and supervision and training of laboratory personnel.

Based on 60 hours of videotapes stolen from the lab last year by the underground Animal Liberation Front and the examination of research papers and proposals, the Washington, D.C.-based People for Ethical Treatment of Animals (PETA) has charged that Gennarelli's research is inhumane and without scientific merit. The tapes — which show animals writhing during surgery and head acceleration, as well as researchers joking during experiments and smoking during surgery — document animal abuse, scientific fraud and violations of both the Animal Welfare Act and the NIH guidelines, says Lori Gruen of PETA.

PETA member Nedim Buyukmihci, a veterinarian at the University of California at Davis, says Gennarelli's procedures are too inconsistent to give a reproducible model and too limited in scope to adequately mimic the injuries sustained by human accident victims. "After 15 years and $11 million to $13 million, essentially nothing has come out of this research that hasn't already been known from studies of human head trauma," Buyukmihci told SCIENCE NEWS.

Others argue that the research is of good quality. A spokesperson for the Society for Neuroscience, in Washington, D.C., says that when the head injury laboratory grant came up for renewal by a two-tiered peer review system at NIH this spring, the lab "passed with flying colors." This was in spite of a simultaneous NIH investigation of the lab, initiated in response to the publication of the stolen videotapes this year.

Sylvia Shaffer, an information officer at NIH, says Gennarelli's research has provided some techniques for treating brain injuries caused by swelling, changes in blood flow and changes in metabolism. Thomas Langfitt, who chairs the department of neurosurgery at the University of Pennsylvania and directs the clinic, says Gennarelli's research has provided the first evidence of the possibility of regeneration of damaged nerve cells — a ray of hope for humans with brain and spinal cord damage.

The NIH report on Gennarelli's research has been delivered to the University of Pennsylvania, which has two weeks in which to respond to the allegations. Wyngaarden will then decide the future of the research. —*J. Dusheck*

Conversing with computers naturally

Query a personal computer in plain English and the machine more often than not replies with a curt error message. A microcomputer's low speed and small memory strictly limit its capacity for handling grammar and English sentences. Such a computer can't figure out what users want unless they express their needs precisely in a language it can understand.

But as personal computer users struggle to retrieve and collate information from increasingly complex and unwieldy computer files and data bases, something more than memorizing lists of commands or following sequences of instructions is needed. To meet this need, computer programmers are now trying to introduce a more natural, conversational tone.

Software packages like INTELLECT (developed by Artificial Intelligence Corp. of Waltham, Mass.), which allow users at a terminal of a large computer to retrieve information simply by typing in English-language questions, are already popular. These programs can even deal with incomplete or ungrammatical requests.

One of the more ambitious schemes to shoehorn a large natural-language system into a personal computer is the Natural Access System, developed by Bozena H. Thompson and Frederick B. Thompson of the California Institute of Technology in Pasadena. Last week, the researchers described their approach at the National Computer Conference in Chicago.

The key is to use the input sentence, together with a dictionary and grammar table, to identify which procedures and pieces of data must be brought into the computer's main memory. This is done with an elaborate "paging" scheme that is closely linked to the processing or parsing of the sentence. As the sentence is parsed, small blocks or "pages" of relevant digital information are delivered from peripheral storage to the main memory.

"The user's input sentence is all that is needed to orchestrate the loading of the data and procedures necessary for the processing of that sentence," the researchers report.

Although the main memory may be small, the system can call upon practically an unlimited number of pages stored elsewhere. As a result, in answering a single question, it can, as needed, integrate text, pictures, data, display formats, statistical processing and information scattered throughout several files. A user can, for example, make a request like "Display a bar graph of pineapple production over the last five years in Hawaii" and, if all of the needed information is accessible to the computer, expect an answer without doing anything more.

The Natural Access System is now implemented and running on microcomputers such as the IBM Personal Computer AT with 640 kilobytes of internal memory. Tests show that this type of computer, for instance, given a list of 1,500 cities in one data base, takes about 20 seconds to answer: "What is the average population of cities?" Answers to some queries are available within 4 seconds. The Thompsons expect to demonstrate their system publicly in September.

The first and so far most successful company to come up with a natural-language interface for microcomputers is Microrim Inc. of Bellevue, Wash. Although not as comprehensive as the Thompson program, its "Clout" software processes database queries typed in free-flowing English. To understand a sentence, the program checks a set of "dictionaries" that describes what the data base contains and lists key words and "glue" words used to put sentences together.

A related product, Savvy (Excalibur Technologies Corp. of Albuquerque, N.M.), at least in its earlier versions, ignores grammar and vocabulary and instead relies on recognizing patterns — matching strings of characters without analyzing their meaning — to identify key words and phrases typical of the user. Although such a scheme is more vulnerable to error, it takes up so little memory that it fits on computers like the Apple II. — *I. Peterson*