scientists just coming on line.

Budget restrictions will also force the closing of 19 of the 93 hospital-based clinical research centers. Now operating at 50 percent capacity in a phase-out process, a $76.6 million allocation for general research programs may save some but not all of these programs. The allocation is $7 million above budget estimates but $8 million below the 1969 level.

In Senate-House conference on the appropriations bill, a compromise was reached in which the Senate's increases were generally cut by half. Thus the bill, as passed by the House and coming up for Senate approval, would boost virtually all institute appropriations (see chart).

For the delivery of health care, the regional medical programs will receive the $100 million as requested in the budget and approved by the Senate, instead of taking a $24 million cut proposed by the House. In addition to following the original course of work in heart disease, cancer and stroke, the regional programs are being expanded to include other diseases and are turning attention to improving health services in disadvantaged areas.

Allocations for the construction of health education, research and library facilities will be $149 million, up from $93 million last year, and funds for general research support grants, given to entire academic departments, will hold even at $60,700,000.

Altogether, the proposed NIH increases, a spokesman says, represent no tremendous jump over funding for the previous year and, in fact, the institutes are doubtful that they will ever actually receive the increases if they are appropriated.

The expectation is that once the appropriations bill is passed, the Bureau of the Budget will actually release funds at a level corresponding to that initially requested by the President even though members of Congress have warned against such a course.

A WASPISH CONFERENCE

No consensus on CO research

Carbon monoxide is a major component of air pollution, and the automobile is the major contributor of carbon monoxide in the urban atmosphere. It is known that the gas in large doses affects the health and can even cause death, but those levels have not yet been reached in community air. The present trace levels are enough to cause worry, but the extent of their impact on the human system is not yet clearly known (SN: 11/22, p. 480).

That lack of knowledge showed up this week at a New York Academy of Sciences conference on carbon monoxide, which found scientists in waspish disagreement over the extent of the problem. While the formal presentation of papers was carried out with genteel politeness, it was clear that the subject has raised emotions.

The tone was set by Dr. Patrick J. Lawther of St. Bartholomew's Hospital Medical College in London, who said, "Seventy percent of those who are doing research in the field should go home and do something else." The quality of carbon monoxide research, he says, is just not up to par.

The controversy revolves around the effects of small amounts of carbon monoxide on the central nervous system, where it can affect behavior, and the more serious physiological disturbances in such areas as the heart and the respiratory system, where oxygen supply plays a major role.

In both cases, carbon monoxide when inhaled, enters the system by joining with hemoglobin in the blood to form a compound called carboxyhemoglobin. The increased amount of carboxyhemoglobin restricts the amount of oxygen that the blood can carry.

One area of controversy is the translation of a measure of carbon monoxide in the air into levels of carboxyhemoglobin in the blood of an average urban breather.

In Los Angeles, for instance, says Dr. John R. Goldsmith of the California State Department of Public Health in Berkeley, the average year-round carbon monoxide level is between 10 and 12 parts per million. After 12 hours of continuous exposure to such levels, carboxyhemoglobin reaches a level of 2 percent in the blood, he says.

But that doesn't mean that all Angelenos can be assumed to have 2 percent carboxyhemoglobin in their blood, says Dr. Lawther. The carbon monoxide level, at different times and places, could climb briefly as high as 100 parts per million, and levels of 300 parts per million have been measured. Similarly, individual characteristics and activities could alter the time it takes for monoxide to enter the system. A lot depends on the weather, too.

Asking what the carboxyhemoglobin level is, says Dr. Lawther, is like asking, "How high is up?"

Even if carboxyhemoglobin levels could be accurately determined, their effects are elusive. Most experimentation has been done on impairment of the functioning of the central nervous system, which shows up in slower reaction time and perception. The results of these experiments have been contradictory, insofar as they can be compared at all.

At low levels, most researchers agree there may be some impairment of performance and behavior. But the severity of impairment is still unresolved. Dr. T. H. Rockwell of Ohio State University in Columbus found that human performance in regard to automobile driving decreased as carboxyhemoglobin level increased from 0 to 20 percent. On the other hand, Dr. P. J. Mikulka and his associates at Old Dominion University in Norfolk, Va., found that reaction time and perception did not degrade as a function of three hours' exposure to carbon monoxide at levels of 250 parts per million. Furthermore, Dr. Thrift G. Hanks of SysteMed Corp., in Newport Beach, Calif., reports no significant relationship between carbon monoxide exposure for about 4 hours at levels up to 100 parts per million, and the ability to perform critical tasks.

Dr. Lawther could not find any impairment of perception at levels up to 10 percent, but at this level the ability to do mathematical problems was somewhat affected.

One trouble with these experiments is that their results defy comparison because the experimental conditions are not matched. Even more serious is the difficulty in measuring psychological performance, particularly in subjects whose recent activities are not known.

Such things as alcohol consumption the night before or smoking habits, could bias the results significantly, says Dr. Lawther.

But impaired perception and reaction time are not as serious as possible effects of high levels of carbon monoxide on the heart and circulatory system. Unfortunately, the effects of atmospheric carbon monoxide on these systems are even more difficult to determine than behavioral impairment. As yet, there is no evidence at all that community air pollution produces any chronic effects specific to carbon monoxide.

In fact, suggests Dr. Goldsmith, some carbon monoxide intake would have a sedative effect that might be beneficial to some.

The conference, says Dr. Ronald F. Coburn of the University of Pennsylvania, who was co-chairman with Dr. Lawther, was designed to review the present state of research on carbon monoxide effects for the use of Government officials setting pollution standards. What the conference shows, says Dr. Lawther, is "the need for repeated experiments by highly qualified researchers under controlled conditions."