Congress and the ethics of biomedical research

By signing into law one comprehensive bill President Nixon can set in motion machinery that could cure many of the problems that have been plaguing biomedical and behavioral research for the past few years. The specific problems have to do with ethics and money.

Psychosurgery, research on live aborted fetuses, sterilization of welfare recipients and the legal rights of children, prisoners and the mentally handicapped have all been subjects of public concern in recent years. And each of these problems has prompted the drafting of one or more pieces of legislation (SN: 5/12/73, p. 310). The other problem, money for basic research, became acute last year when the Administration slashed Federal funding for research training grants. This too prompted action in both the Senate and the House (SN: 9/24/73, p. 181). Now, after six weeks of compromise, Senate and House conferees have settled on one piece of legislation that attempts to address many of the problems facing the biomedical research community.

The compromise bill draws mainly from legislation submitted by Sen. Edward M. Kennedy (D–Mass.) and Rep. Paul G. Rogers (D–Fla.). It calls for the establishment of a national commission for the protection of human subjects of biomedical and behavioral research. The eleven members of the commission would be selected by the Secretary of the Department of Health, Education and Welfare from the fields of medicine, law, theology, ethics, philosophy, humanities, health administration and public affairs. Their first project would be a four-month study of the pros and cons of research on living fetuses. All federally funded research on human fetuses would be banned until the commission completes its study and recommends to the Secretary of HEW the circumstances under which such research should be conducted. This problem gets top priority because of the recent outcry raised in Boston where several researchers doing work on fetuses were charged with violating a 19th-century grave-robbing statute.

The commission would function for two years. During that time it would attempt to develop ethical guidelines for all federally funded clinical research and make recommendations to HEW. The commission would also do a study to determine whether some mechanism is needed to protect human subjects involved in research not funded by the Government. Controls on privately funded research would call for further legislation.

Other projects for the commission would be a study of the use of psychosurgery and the development of a definition of informed consent, especially where it applies to children, prisoners and the mentally incompetent. After two years the commission would be replaced by a national advisory council for the protection of research subjects. In the past the Administration has indicated that such a commission is unnecessary.

The other major portion of the bill has to do with reinstating research training grants and fellowships for young scientists. In the past, such grants have provided much of the impetus that has gotten predoctoral and postdoctoral students into basic research. The proposed legislation calls for the establishment of national research service awards to be funded at the rate of $208 million per year for the next two years. Recipients of such awards would be required to repay the Government by devoting subsequent equal time to research, teaching or work in the National Health Service Corps.

Final wording of this bill is being drafted this week, and the completed package is expected to be on President Nixon's desk by the end of the month.

Wrong cells being used in cancer labs?

A report on cancer cell cultures published last week could have dramatic implications for cancer research worldwide. Walter A. Nelson-Rees, Robert R. Flandermeyer and Paula K. Hawthorne, biologists at the University of California School of Public Health, studied cultures of cells presumably derived from many types of human cancers. In the June 7 SCIENCE they report that cancerous cells supposedly from the embryonic human kidney, and the adult human breast, prostate gland and fatty tissue, used for basic research in laboratories around the world, were all cells derived from one woman's cervical cancer.

If true, hundreds of cancer researchers may be studying the wrong cells, and much published data would be invalidated.

The single cell type they found is called HeLa, after Helen Lane, a woman who died of cancer of the cervix in 1951. HeLa cells were the first human cancer cells to be successfully cultured in the laboratory, and descendants of those original cells are still grown and used for basic cancer research. Scientists can now culture tumor cells from many other human organs, too, but the Nelson-Rees team found, through chromosomal and enzymatic analyses, that many of those "other" cells may actually be HeLa cells which have contaminated and overtaken the original cultures.

By chromosome staining, the team found two marker chromosomes present in three cell cultures from three different people. Two human breast cancer strains and one embryonic kidney strain all showed the presence of two chromosomes, demonstrating a similar genetic heritage where none was presumed to exist.

More important, four marker chromosomes previously shown by several researchers to be present in HeLa cells were also present in the breast, kidney, prostate and fatty tissue cancer cells. The probability of all four of these marker chromosomes appearing in genetically unrelated cell cultures would be one in 600 million, Nelson-Rees told SCIENCE NEWS.

The team turned up two other compelling pieces of evidence that the cultures are really HeLa-derived cells. They found no Y chromosomes (the sex determinant in human males) in cell cultures from male donors, including the prostate tumor cells, fatty tissue tumor cells and possibly the embryonic kidney cells (donor information was lacking.) HeLa cells lack Y chromosomes because of their female donor. And they found a rare, genetically determined enzyme (G6PD) present in all of the cells tested that is only found in blacks. Helen Lane was black, but some of the other cell donors were white.

The Nelson-Rees team theorizes that the various cell cultures have been contaminated with HeLa cells because of imprecise laboratory technique, mislabeling of culture bottles or cross-culturing errors. Because HeLa cells are so well adapted to growth in the laboratory, they can easily overtake a less hardy group of tumor cells. After