

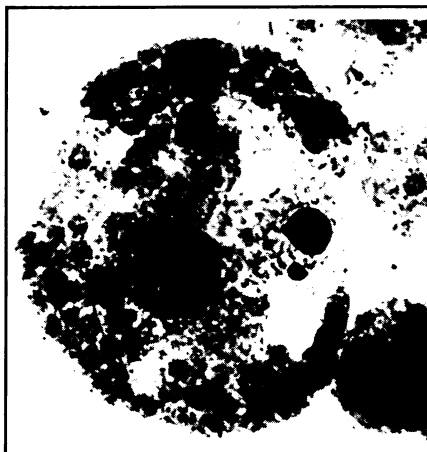
## Animal? Vegetable? No. Plantimal

Three separate research groups have now successfully fused animal cells with plant cells to form the first interkingdom protoplasts. Let's just skip the bad jokes about pre-smoked chicken and built-in rabbit incisors and call them "plantimals."

One group fused human cells with tobacco cells. Another fused tobacco and rooster cells. A third fused human and carrot cells. These microscopic hybrids are far from recognizable as either animal or vegetable (not to mention useless for any of the serious or silly applications one can conjure) but they have, nevertheless, the potential to provide genetic information about both kingdoms.

A group from Brookhaven National Laboratory, headed by Harold H. Smith, report the first fusion in the July 30 SCIENCE. That group fused protoplasts of tobacco cells and human cervical tumor cells (HeLa S3 cells). (Protoplasts are spherical sacs of protoplasm—cells with the outer wall stripped away.) The team chose both cell types for their tendencies to grow vigorously, and the protoplast cell form due to its success in previous plant-plant and human-mouse fusions.

They made the protoplasts by stripping away the tobacco and HeLa cell walls with enzymes, then grew each type in its respective culture medium. They then combined the protoplasts in a mixed culture medium and added polyethylene glycol—a substance much like antifreeze that causes the protoplast membranes to stick to each other. After three hours, and for the next six days, the team observed, with a light microscope, stained human nuclei and stained tobacco nuclei together in tobacco protoplasts. They reconfirmed this observation by radioactively labeling and detecting "hot" human nuclei in the to-



Human (large) and tobacco nuclei in cell.

bacco protoplasts.

A second group, headed by James X. Hartmann of Florida Atlantic University at Boca Raton, achieved the fusion of rooster red blood cells with tobacco cells. In a paper recently submitted to PROTOPLASMA JOURNAL, Hartmann reports finding tobacco chloroplasts (sites of photosynthesis) in the rooster cells for up to five hours. A third group from the Hungarian Academy of Science's Biological Research Center at Szeged, successfully fused HeLa (human tumor) protoplasts with carrot protoplasts.

If a fused cell can be nurtured and persuaded to survive for long periods, the Brookhaven team states in SCIENCE, it should be possible to look for enzymes and proteins coded by the tobacco and human chromosomes and at the distribution of these gene products in the cells.

If the cells divide and, as in human-mouse fusion studies, human chromosomes are lost with successive divisions, the remaining human genes will code for

proteins strange to the foreign cell. Thus, those genes could perhaps be located and identified.

James Hartmann, quoted in a recent Miami Herald article, speculates on a stranger potential application for "plantimal" cells: A living, meat-type substance might eventually be grown, he says, that builds animal protein by converting the sun's energy directly to chemical energy, much as a plant does. □

## Mammography: Benefits versus risks

One of the major clinical spinoffs of the National Cancer Act of 1971 was the establishment of 27 U.S. centers for early detection of breast cancer—a major cause of cancer-related death among women. The centers were designed to use both physical examinations and mammography, which consists of exposing the breasts to a low dose of X-rays in order to detect a tumor. By last March, 129,000 women had been screened with mammography. Hopes were great that it would drastically reduce breast cancer deaths.

Now a committee of scientific consultants to the National Cancer Institute, headed by Lester Breslow of the University of California at Los Angeles, reports that routine mammography benefits women over age 50, but that it may actually present more risks than benefits to women under that age. Their conclusions are based not on mammography results from the 27 centers (since it is still too early to obtain results from them), but from other results that have become available since 1968. Some examples are:

- The Health Insurance Plan of New York used mammography during the 1960s to routinely screen women members for breast cancer. A follow-up study of 62,000 women who had mammography under HIP reveals that it has reduced breast cancer deaths by one-third in women over age 50, but that it has not reduced breast cancer deaths in women under that age.

- Women exposed to radiation during the atomic bombing of Japan have a high rate of breast cancer.

- Women who have received radiation treatment for benign breast disease are more liable to develop breast cancer than are women who did not receive it.

- Women who received chest X-rays numerous times during tuberculosis treatment have developed more breast cancer than have women who were not X-rayed.

Results from these studies were based on substantial exposure to X-rays—a total exposure of up to 1,000 rads, compared to the low X-ray exposure of mammography (about one rad per treatment). Nevertheless, the committee concludes, the risks from even this modest exposure are not offset by the benefits for women under age 50. □

## Stever appointed to White House post

Much to the surprise—and apparent delight—of most of Washington's scientific establishment, President Ford has officially appointed National Science Foundation Director H. Guyford Stever to fill the newly created White House science adviser post. The appointment is being made over the strong opposition of some conservative members of the President's own party, who recently wrote him a strongly worded letter charging that Stever's nomination would be "an affront to the Congress." (SN: 7/3/76, p. 7).

The fight over Stever started some time ago with a congressional investigation of NSF's science education programs and the conventional wisdom has been that Ford would not risk alienating conservative Republicans while he is still struggling for nomination. Indeed, two months have passed since the National Science and

Technology Policy office was created, and White House interest seemed minimal.

One possible explanation of the timing may be that the President was influenced by the quiet, continuous encouragement to fill the post coming from moderate Republican congressmen who have supported the traditional bipartisan science policy. Rep. Charles A. Mosher (R-Ohio), ranking minority member of the House Science and Technology Committee, told SCIENCE NEWS the action was "typical of Ford" who "to an amazing degree separates politics from these other considerations." He and others had urged the President to fill the post quickly.

Senate confirmation hearings for Stever were scheduled for July 28 with a floor vote to follow soon thereafter. Insiders now expect little trouble in obtaining swift approval of the appointment. □