Science units spared in shuffle

The Office of Science and Technology Policy (OSTP) and the Council on Environmental Quality (CEQ) have survived President Carter's White House reorganization virtually unscathed. Speculation had run high recently concerning the probable demise of CEQ, and Frank Press, director of OSTP, told reporters this week that the reorganization team had originally been "disbelievers" in the value of his office. Now, he says, the few changes that have been proposed will probably further "integrate us into the daily life of the President."

Under the reorganization act, Congress has permitted the President to shift management responsibilities within the executive branch of government at will, so long as legislatively mandated functions are preserved and unless Congress specifically objects to some change. Carter's proposed modifications in the Executive Office of the President, announced last week, will thus become official in 60 days if Congress does not object. Reorganization of the rest of the federal bureaucracy will come in subsequent stages, over the next three or more years.

Changes proposed for the science-advising apparatus generally affect the panels of outside experts appointed to investigate specific issues, rather than the daily function of OSTP itself. The President's Committee on Science and Technology, for example, will be abolished and its duties reassigned by the reorganization team. The Federal Coordinating Council on Science and Technology will be moved out of OSTP and reestablished as a working group attached to the cabinet. Preparation of the congressionally mandated reports on the state of science will now be reassigned to the National Science Foundation.

Similarly, some of CEQ's routine review duties will be passed to operating agencies. The Environmental Protection Agency, for example, will take over CEQ's evaluation responsibility under the Federal Nonnuclear Energy Research Development Act. The Council will, however, continue to publish its annual report on environmental quality.

Press used the occasion of the reorganization announcements to tell reporters about some of the projects his office has become involved in and to introduce some new assistant directors.

The OSTP is now helping conduct eight or so policy-making reviews on national security affairs, including staff work for studying the comprehensive test-ban treaty and antisatellite weapons agreement. In other areas, the office is leading a review of uranium resources and is involved in studies of dam safety, world hunger, recombinant DNA research, climate, patent policy, technology for development, ocean policy, storage of radioactive wastes, a review of the defense R&D budget and other projects.

Press announced appointment of three new assistant directors, two senior consultants and several policy analysts including: Benjamin Huberman, assistant director for National Security, International and Space Affairs; Gilbert S. Omenn, assistant director for Human Resources and Social and Economic Services; and Philip M. Smith, assistant director for Natural Resources and Commercial Services.

"I feel in a very upbeat mood," Press said in describing his job now that he has had time to adjust to Washington. Of OSTP itself: "I am pleased with the way the office has evolved." Press says he can see the President "when I want to" but usually writes memoranda, about twice a week. These, he says, almost always prompt a handwritten reply from Carter.

Clearly, Press has established a rapport with the President and clout in the White House unparalleled by any other science adviser in recent times. □

Gene control: Frog DNA in newt eggs

Each cell in a complex organism consults a small fraction of the information coded in DNA in its nucleus. A liver cell never reads the parts of its DNA instructions that describe proteins peculiar to a nerve cell. And adult cells, under normal conditions, never revert to making the proteins specific to immature cells. Yet under experimental conditions, closed chapters of the DNA manual can be reopened. For example, the nucleus from the skin cell of an adult frog can, if transplanted into an egg, still direct tadpole development. How genes switch on and off during development is one of the most intriguing mysteries of biology.

A strange combination of cell parts, resembling the contents of the witches' cauldron in *Macbeth*, now promises to illuminate that question. Instead of "Eye of newt and toe of frog," Eddy M. DeRobertis and J.B. Gurdon combined immature egg cells (called oocytes) of newts with nuclei, containing DNA, from African clawed frogs. In the remodeled cells, each containing about 200 frog nuclei, the frog DNA directs production of frog proteins, which are clearly distinguishable from newt proteins.

The cue as to what part of the frog DNA should be read comes from the newt part of the cell. The hybrid cells make at least three proteins that are normally found only in immature frog eggs. The hybrid cells also produce several proteins typical of both oocytes and the adult frog cells (in this case, laboratory-grown descendants of kidney cells). The cells make no protein of types not found in oocytes. Thus, the researchers state, molecules in the newt oocyte "reprogram" the gene expression of the frog nuclei.

These experiments differ from previous work in which nuclei were transplanted between cells, because formerly the new proteins were detected only after many cell divisions. Researchers proposed that cell division is necessary for major changes in gene activity. The recent experiments rule out that hypothesis because although they have not divided, frog nuclei, after they are injected into the newt oocytes, express a different set of genes. "This shows that oocytes contain *specific* gene-controlling substances," DeRobertis and Gurdon write in the June PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES.

PNAS

Frog nuclei swell from original size (inset) after injection into immature newt eggs.

Not all the proteins made by normal frog oocytes were detectable in the hybrid eggs. The investigators point out that the newt they used (*Pleurodeles*) is only distantly related to the frog *(Xenopus)* and might be able to recognize some, but not all, of the signals that regulate frog gene expression.

Purified DNA molecules, as well as whole nuclei, have been injected into amphibian oocytes to pose other questions about cell operations. One paradox that Gurdon, Andrew H. Wyllie and Jenny Price examined is how cells containing enzymes that degrade DNA avoid destroying their own genetic material. Some investigators propose that the membrane of the nucleus keeps those enzymes from the essential DNA. In further work at the Medical Research Council in Cambridge, England, the biologists found evidence that, instead of relying only on physical separation, the nucleus contains a component that makes DNA invincible to the enzymes. When DNA from SV40, a virus that infects monkey cells, is injected into the cytoplasm of oocytes, it is always degraded, Gurdon and co-workers found. When the DNA is injected into the oocyte nucleus, it is conserved in its circular, supercoiled form. However, if the injection ruptures the nuclear membrane, so that the viral DNA first enters the nucleus but then leaks out, the DNA remains intact in the cytoplasm. Such a shield, the researchers suggest in the July 14 NATURE, is important to protect DNA during cell division, when the nuclear membrane breaks down.

Gurdon and colleagues also consider