implications for the validity of the sex-ratio findings of the failure to demonstrate parallel changes with regard to the frequency of malformations or stillbirths or neonatal deaths, it should be pointed out that Neel (*15*) has recently suggested, on the basis of an analysis of certain aspects of the Japanese data and a comparison of the findings with those available for Caucasian populations, that a significant fraction of congenital malformations may be the segregants from complex homeostatic genetic systems. If this viewpoint is correct, then it follows that induced mutations at loci involved in these homeostatic systems, while ultimately resulting in an increase in malformation frequency, would not be expected to bear the same simple and immediate relationship to malformation frequency as sex-linked lethal mutations do to the sex ratio. It may well be, then, that no conflict of evidence is involved in the failure to demonstrate an effect of radiation exposure on malformation frequency in the first postbomb generation.

Summary

An analysis of new data concerning the sex of children born to the survivors of the atomic bombings of Hiroshima and Nagasaki, together with a reanalysis of the data previously presented by Neel and Schull (*9*), reveals significant changes in the sex ratio of these children, changes in the direction to be expected if exposure had resulted in the induction of sex-linked lethal mutations (*16*).

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16. The data here presented were collected under the auspices of the Atomic Bomb Casualty Commission, Field Agency of the National Academy of Sciences–National Research Council of the United States and the National Institute of Health of Japan. Analysis of these data was sponsored by the U.S. Atomic Energy Commission under a grant to the University of Michigan [contract AT(11-1)-405].

News of Science

Role of Director of Defense Research and Engineering under the Department of Defense Reorganization Act

One of the elements of the Department of Defense Reorganization Act (now signed into law by President Eisenhower) that has brought forth little criticism from opponents of the bill is that calling for the appointment of a "Director of Defense Research and Engineering." In his message to Congress of 3 April, the President, pointing to the history of interservice rivalries in the research field, the intensification of these conflicts in recent times, particularly in regard to missile development, and the folly implicit in tolerating "this unwise service competition in this critical area," offered the following solution:

President's Request

"To give the Secretary of Defense the caliber of assistance he requires in the research area, I recommend that the new position of Director of Defense Research and Engineering be established in place of the Assistant Secretary of Defense for Research and Engineering. I believe his salary should be equal to that of the secretaries of the military departments. He should rank immediately after the service secretaries and above the defense assistant secretaries. As the principal assistant to the Secretary of Defense for Research and Development, he should be known nationally as a leader in science and technology. I expect his staff, civilian and military, also to be highly qualified in science and technology. This official will have three principal functions: first, to be the principal adviser to the Secretary of Defense on scientific and technical matters; second, to supervise all research and engineering activities in the Department of Defense, including those of the Advanced Research Projects Agency and of the Office of the Director of Guided Missiles; and, third, to direct research and engineering activities that require centralized management. Further, it will be his responsibility to plan research and development to meet the requirements of our national military objectives instead of the more limited requirements of each of the military services. It is of transcendent importance that each of our principal military objectives has strongly and clearly focussed scientific and technical support.

"With the approval of the Secretary of Defense, this official will eliminate unpromising or unnecessarily duplicative programs and release promising ones for development or production. An especially important duty will be to analyze the technical programs of the military departments to make sure that an integrated research and development program exists to cover the needs of each of the operational commands. It will be his responsibility to initiate projects to see that such gaps as may exist are filled. In addition, the director will review assignments by the military departments to technical branches, bureaus and laboratories to assure that the research and engineering activities of the Defense Department are efficiently managed and properly coordinated. I would charge the director, under the direction of the Secretary of Defense, with seeing that unnecessary delays in the decision-making process are eliminated, that lead times are shortened, and that a steady flow of funds to approved programs is assured. Only under this kind of expert, single direction can the entire research and engineering effort be substantially improved. In these various ways, he should help stop the service rivalries and self-serving publicity in this area."

Congressional Response

The act fulfills all of the requirements of the President's message in this matter. It lists the three functions of the Director of Defense Research and Engineering as the President had enumerated them, and implies others about which he had been specific. The full meaning and intent of the President's recommendations are realized in the act.

Changes Effected

Two major significant changes are effected by the Reorganization Act in the matter of military research. The first is one of status. Appointment of a Director of Defense Research and Engineering reflects the formal recognition of science's critical role in the military. The Committee on Armed Services of the House, chaired by Carl Vinson, put its views in this way in a committee report: "From the testimony presented, and from prior hearings on the subject of research and development, the committee is of the firm opinion that the Secretary of Defense has need for a principal assistant on scientific and technical matters. The research and engineering activities of the Department have become so extensive and varied in nature as to require a director whose sole function is to perform overall supervision of those activities and to direct and control those which the Secretary considers to require centralized management. The responsibilities of the Director of Defense Research and Engineering will be of such far-reaching importance to the Department as a whole that the committee feels he should be a member of the Armed Forces Policy Council, and have so provided in this legislation." The importance of the position is further emphasized by the adoption of the President's recommendation that the new Director should rank above the Assistant Secretaries of Defense, and should receive compensation equivalent to that of the Secretaries of the services.

Advance Research Projects Agency

A second major change is that which affects the Advanced Research Projects Agency (ARPA). The bill deletes from section 7 of the Act of 12 February 1958 the authority for the Secretary of Defense, or his designee, to contract for research and development work. The intent of this change is to take away from the Advanced Research Projects Agency the authority to enter into research and development contracts, since the Director of Defense Research and Engineering will supervise the Advanced Research Projects Agency and can receive the necessary power to contract by delegation from the Secretary of Defense.

As it would appear now, before the Reorganization Act goes into effect and the all-important question of who will take the post of Director of Defense Research and Engineering is decided, the main effect of the provisions concerning the Advanced Research Projects Agency will be a matter of the channeling of funds. The function of the agency has not been altered; only the route by which it receives its appropriations. The man occupying the post, one "known nationally as a leader in science and technology," if the President's specifications are met, would presumably be well inclined toward the aims of the agency—research and developments with regard to advanced space projects—and, with the new power of his position, would be able to aid in their achievement to a greater degree of effectiveness than the now existing Assistant Secretaries of Defense for Research and Engineering.

A second possible change concerning ARPA involves an eventual shift of certain aspects of its work to the office of the Director of Defense Research and Engineering. In report 1765 of the House Armed Services Committee, quoted above, the following statement appears: "The committee recognizes that the Advanced Research Projects Agency will continue to have authority to engage in advanced space projects until 12 February, 1959, unless otherwise restricted by law or by the direction of the Secretary of Defense. At the same time, it recognizes that some such projects will be of primary military significance and that some provision must be made for continued military participation in this area. Therefore, in section 9 of the bill, the Secretary of Defense or his designee, subject to the approval of the President, is authorized to engage in basic and applied research projects essential to military requirements. It is intended by these provisions to authorize the Secretary of Defense, or his designee, to engage in outer space projects beyond February 12, 1959, if such projects have primary military significance, and are not precluded by law and are approved by the President."

This shift of essentially military projects from the Advanced Research Projects Agency to the Director of Defense Research and Engineering is accomplished by the relevant deletion in the legislation establishing ARPA and the inclusion in the new bill of the provision: "The Secretary of Defense shall assign any weapons system to such military department or departments for production and operational control as he may determine."

Benefits of New Position

The establishment of the position of the Director of Defense Research and Engineering under the Department of Defense Reorganization Act of 1958 accomplishes three major ends which are designed to ameliorate the conditions under which the department's scientific activity is carried on. The first aim is consolidating and streamlining. The responsibilities for research are brought together in one post. The person filling this post would serve as the "principal assistant on scientific and technical matters" to the Secretary of Defense. Research and development projects which have primary significance in their military applications would come under his control and funds for these projects would be channeled through him from the Secretary of Defense.

To emphasize his role, and through it, the role of science and technology in the nation's defense activity, the Director of Defense Research and Engineering is given the two prestige marks requested by the chief executive—rank above the Assistant Secretaries of Defense and compensation equal to that of the Secretaries of Army, Navy, and Air Force.

And lastly, he is given specific authority to "direct and control research and engineering activities that the Secretary of Defense deems to require centralized management."

By these means, the Director of Defense Research and Engineering should have the position, the prestige, and the explicit authority to control from a superior position the scientific and technical projects of the Department of Defense, to establish, fund, and direct them with a freedom of action and directness of delegation hitherto unattainable.

Explorer IV

The United States launched its fourth and heaviest satellite—38.43 pounds—on 26 July. Explorer IV (1958 Epsilon) is designed for an intensive study of corpuscular radiation in space as part of the International Geophysical Year program. It is the first of this country's satellites to be launched in a northern direction from the Missile Test Center at Cape Canaveral, Fla., and it will report information from higher latitudes not previously explored by U.S. satellites.

Explorer IV was put in orbit by a Jupiter C launching vehicle developed jointly by the Army Ballistic Missile Agency and the California Institute of Technology Jet Propulsion Laboratory. The four-stage Jupiter C missile also was used to launch Explorers I and III [*Science* **127**, 330 (14 February 1958)]. The new satellite circles the earth in 110.224 minutes, with a apogee of 1379.8 statute miles and a perigee of 157.3.