tium-90/total-fission-product-activity ratio is calculated.

5) Each day's measured beta activity is converted to strontium-90 activity by use of this factor.

This method of calculation would give high strontium values for locations near test sites on days of high fallout. This is caused by the attribution of activity to the total accumulated pool of fission products rather than to the immediate burst which caused the fallout. This can be corrected by treating these few cases individually.

The major approximations of this technique are as follows:

1) Tropospheric and stratospheric debris enter a pool which contributes to the fallout at each location.

2) The mixed fission products from each detonation decay according to the $t^{-1.2}$ law.

3) The relative tropospheric and stratospheric depletion rates are not considered at this time.

The only practical means of evaluating the new calculation technique is by comparison with radiochemical analyses of open samplers. During the period from May 1956 to June 1957, several locations had parallel sampling units for at least part of the time. These data are shown in Table 2, in which it is shown that the gummed-film system, together with the above-mentioned method of computation, yields estimates of strontium-90 deposition which tend to be higher than the estimates derived by radiochemical analyses of pot samples. The mean ratio of strontium-90 estimated from gummed-film to pot analyses is 1.45, with a maximum ratio of 1.66 at Salt Lake City and a minimum of 0.90 in New York City.

The calculation of external gamma dose is less sensitive to variations in the source of fallout. In addition, it appears that the important gamma dose from fission products is from internal cesium-137 rather than from the external gamma radiation from distributed fission products after suitable allowance for shielding and weathering.

## Conclusions

The range of values for strontium-90 deposition through June 1957 in the United States is 11 to 54 millicuries per square mile, which is somewhat higher than other large land areas of the world. Excluding the United States, deposition in the Northern Hemisphere averages 16 millicuries per square mile, about twice the average for the somewhat fewer values reported in the Southern Hemisphere.

The calculated external gamma doses given in Table 1 are estimates of the infinity doses and have not been corrected for shielding and weathering. Our best estimate of the actual external dose to the population is approximately 10 percent of the tabulated values. The dose may actually be lower, but a factor of 10 is a conservative estimate of the effect of shielding and weathering.

### References and Notes


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# News of Science

## Excerpts from the Summary and Conclusions of the Report of the United Nations Scientific Committee on the Effects of Atomic Radiation

In estimating the possible hazards of ionizing radiation, it is clearly necessary to know both the levels of such radiation received by man and his environment from various sources, and the present and future effects likely to be produced thereby. It is of particular importance to assess the effects of radioactive fallout from nuclear weapons, since this source of general environmental contamination is of recent origin, has been of uncertain significance, and has led to concern in the minds of many people. All sources of radiation must, however, be reviewed for a complete evaluation of the situation.

The Committee, aware of the complexity of this task, knows that our present information about radiation levels and effects is inadequate for an accurate evaluation of all hazards, and that many of the estimates will necessarily be approximate or tentative.

The physical characteristics of ionizing radiation, and the amounts of human exposures to it, are at present more accurately known than its biological consequences, especially where small doses and dose rates are concerned. In the present chapter, therefore, we review first the amounts of radiation received by man, both in regard to the exposure of individuals and of whole populations, and in respect to present and possible future levels. We then attempt to estimate the biological effects of varying amounts of radiation of different types, and to evaluate the hazard resulting from certain sources of particular significance.

. . . In view of the complex nature of the subject, individual sentences or assessments may easily be misunderstood unless related to the context of the report as a whole. . . .

### Radiation from Natural Sources

The radiation received by man from natural sources varies somewhat from place to place according to the local radioactivity of the earth's surface; and that of only occasional populated areas exceeds the average by a factor of 10. Studies on populations living in these areas are of extreme interest for the development of our knowledge on the effects of small doses of radiation. The contribution from cosmic rays differs at different altitudes and geomagnetic latitudes. That from the normal radioactive potassium and carbon content of the body is about the same in different people, but the radiation due to radium, thorium and their decay products varies considerably. The radioactivity of the masonry used for some types of dwelling may appreciably increase the radiation exposure of the occupants. . . . Harmful effects attributable to radiation from natural sources are not known with any certainty, but it seems likely that some genetic, and possibly some somatic, injury is caused in this way.

### Exposure Due to Medical Procedures

It is useful to estimate this exposure, appropriately averaged over whole populations, since the genetic, and perhaps some somatic, effects of these procedures will depend upon this average value. In the countries with extensive medical facilities where its magnitude has been estimated, the radiation given for medical purposes makes the largest artificial contribution to the irradiation of the population, but no data are available for countries with fewer such facilities. The reported values of genetically significant doses are of the same order as the doses from natural sources. Among medical procedures, the contribution from diagnostic X-ray examinations greatly exceeds that from radiotherapy and radioisotope applications, the latter making only a small contribution; and 80 to 90 percent of the total diagnostic dose to the gonads is due to relatively few types of examination of the abdomen and pelvis. . . .

The significant dose to bone and bone marrow from medical procedures has been less closely studied than the genetically significant dose, although it may be of importance if bone tumours or leukemia are induced by radiation at low dose levels. Although individual marrow exposures vary very widely, the average is unlikely to differ greatly from that received by the marrow from all natural sources.

. . . No information is yet available for prediction of the future trend of medical exposures. It is expected that improvements in equipment and techniques may considerably reduce individual exposures, but the ever-expanding use of X-rays may well increase the world population dose. . . .

### Radiation from Occupations and Wastes

At present, the exposure to ionizing radiation received occupationally forms only a small contribution to the total irradiation of the population as a whole, amounting to about 2 percent of that from natural sources in countries in which occupational exposure is probably largest. With an increasing use of nuclear reactors, of radioactive materials and probably of medical and industrial radiological procedures, this is clearly a figure which should be kept under close review. . . .

The discharge of radioactive waste in countries with nuclear reactors has not led to appreciable radiation exposure of populations, and only small proportions of the wastes produced need to be discharged. . . . [However,] it is important that work should be actively continued on methods of minimizing environmental contamination from these causes.

### Radiation from Fall-out

Fall-out from nuclear weapon tests causes radiation exposure in several ways. Exposure of the world population results from the slow fall-out of fission products which have been distributed in the stratosphere. Exposures also result from any fall-out from the radioactive "cloud" which passes through the troposphere without having reached the higher stratosphere, and from the fall-out which may occur in areas adjacent to weapon tests or within some thousand kilometres of them.

We also consider the ways in which fall-out material causes irradiation to different parts of the body, to people on different diets or under different agricultural conditions, and to people of different ages; and the change in the amounts of radiation that would result from altered or unaltered rates of injection of radioactive materials into the stratosphere.

*Adjacent to tests.* The early fall-out of radioactive materials near to the sites of nuclear explosions, which is influenced by various meteorological and testing conditions, may cause high radiation exposure to individuals within these areas. The amount of such radiation exposures varies very greatly with the weapon tested, with the height of firing, with the distance from the point of explosion, with the direction of winds at various altitudes and with the chance occurrence of rainfall through radioactive material in the early hours after the test. Therefore, at present, these doses cannot in general be calculated. Under very special conditions, high radiation exposure and deleterious effects have been reported, as in the cases of the Marshall Islanders and the crew of a Japanese fishing vessel. Not enough information is available as to the general circumstances in which such local deposition may occur, and the extent and duration of the exposures liable to be involved.

*From the troposphere.* Radioactive materials injected into the atmosphere below the tropopause (at about 14 km) are brought down to the earth's surface by rainfall and sedimentation. This process takes a few months during which they are carried several times around the world. This tropospheric fall-out consists of a mixture of radioactive materials, most of which are short-lived isotopes. At the present time, the tropospheric fall-out is deposited intermittently during the year and a certain deposit of short-lived activities is built up and maintained. When appropriate factors for shielding and weathering effects are included, the gonad and average marrow dose from this deposit, as an external source, is calculated to be about 0.5 mrem per year.

Transient increases of the doses from tropospheric fall-out have been observed in limited areas shortly after weapon tests. These transient increases may give rise for a few days to dose rates of the order of those from natural sources.

The radioisotopes of tropospheric fall-out may be taken up into the body by inhalation and ingestion. Since the radioisotopes of principal concern are short-lived, storage of the contaminated food products reduces the dose which they contribute. The gonad dose over the whole population from inhaled and ingested tropospheric material is negligible as compared with the contribution from this material as an external source. The average bone marrow dose from internal sources is about 0.2 mrem per year.

Increases in radioactivity of the thyroid gland have been found during periods of several weeks or a few months following weapon tests. In human thyroids a dose from iodine-131 of about 5 mrem per year has been estimated for 1955–1956 in the United States excluding areas immediately adjacent to weapon test sites. Doses of this order are unlikely to cause detectable damage or functional change in the gland.

Irradiation of bone may result from incorporation of intermediate and short-lived fission products. Although these materials do not cause prolonged irradiation, they may become selectively concentrated into those areas of bone in which active growth is taking place at the time, and so cause more intense radiation locally than if the same amounts of these materials were distributed throughout the whole skeleton.

The Committee has insufficient information on local variations and temporary increases of tropospheric fall-out in populated areas at different distances from weapon test sites, and emphasizes the lack of further data which would permit evaluation of the biological significance of this source of environmental contamination.

*From the stratosphere.* Radioactive materials injected into the stratosphere, especially by high-yield nuclear explosions, constitute a reservoir from which they fall onto the whole of the earth's surface for many years. The rate of fall-out varies with latitude and is greater in the northern hemisphere, where most of the tests are carried out. Within any given small area, fall-out rate may also vary with local meteorological conditions. . . . The radiation due to stratospheric fall-out from weapons exploded so far will contribute a 30-year gonad dose of 10 mrem, and a 70-year *per capita* mean marrow dose of 160 mrem and 960 mrem for two populations deriving most of their dietary calcium from milk and rice respectively.

Owing to the relatively gradual fall-out from the stratosphere, most of the subsequent radiation is due to two radioactive isotopes of slow decay, other fission products already having largely undergone decay. These two radioactive isotopes are caesium-137 and strontium-90. The physical properties and chemical behaviour of the two differ.

. . . When [caesium-137] is taken into the body, it becomes distributed more or less evenly throughout the tissues, causing uniform irradiation of the whole body; and when present in the surroundings, its penetrating gamma radiations cause a similarly uniform irradiation of tissues.

Strontium-90, on the other hand, is not a gamma-emitter and does not contribute significantly to the irradiation of any part of the body from without. However, on being taken into the body, it becomes incorporated in bone because of its chemical similarity to the normal bone-forming element calcium. This similarity with calcium and selective concentration in bone raises problems which do not occur with caesium-137.

The average concentration of strontium-90 in the bones of children, in whom new bone is continuously being formed, is higher than in adults whose bones were largely formed before the environment, and consequently the food supply, became contaminated with strontium-90. . . .

The radiostrontium concentration in bone is also affected by dietary habit and by the ratio of the amounts of strontium-90 to calcium in the diet. . . .

Agricultural conditions may also affect the content of strontium-90 in the diet, since the available calcium of the soil will, within certain limits, influence the ratio of strontium-90 to calcium in crops derived from the soil. . . .

### Biological Effects of Radiation

The biological effects of ionizing radiation are exhibited in different ways according to whether isolated cells, tissues, organs, or organisms are examined. In passing from unicellular to higher organisms, the primary physicochemical consequences of radiation become increasingly influenced by secondary effects due to the reactions of the organism to the primary events. Detailed knowledge of these reactions is needed for a full understanding of the results and mode of action of radiation. . . .

The effects of ionizing radiations on living matter . . . are still largely unknown. The initial disturbance is associated with ionization (and excitation) of molecules which lead to alterations in their properties. Many functions of the cell are thus affected by radiation, and, although some specific effects may be caused by one or a few events in the cell, many are probably the combined result of numerous such events.

The minimum doses causing certain detectable biological effects differ very much in different organisms, but for most mammals they are about the same magnitude, so that the results of experiments on such animals can, as a first approximation, be applied to man. The sensitivity of different tissues to radiation varies considerably, however. Our knowledge of the biological effects of low radiation levels is meagre because of experimental difficulties and the lengthy observations necessary to obtain results in this field. At present, opinions as to the possible effects of low radiation levels must be based only on extrapolations from experience with high doses and dose rates.

### Effects of Radiations on Man

Man may prove to be unusually vulnerable to ionizing radiations, including continuous exposure at low levels, on account of his known sensitivity to radiation, his long life, and the long interval between conception and the end of the period of reproduction.

Embryonic cells are especially sensitive to radiation, and some evidence suggests that exposure of the foetus to small doses of radiation may result in leukemia during childhood. Irradiation of pregnant mammals has shown that doses exceeding 25 rem to the foetus during certain stages of its development can cause abnormalities in some organs. Some embryonic cells (neuroblasts) of certain species cultivated *in vitro* respond to doses as small as 1 rad. If these results should be applicable to man and since they relate to the development of the brain, the opinion seems justified that even a very small dose to the human foetus may involve some risk of injurious effects if received during a critical period of pregnancy. Radiostrontium must be expected to enter foetal bone when calcification starts in the second trimester of pregnancy, and so cause irradiation of the adjacent developing nervous system and hypophysis with exposures ranging up to that occurring in the bone. The uptake of radiostrontium in foetal bone tissue is, however, at present very small, contributing less radiation than 1 percent of that due to natural sources; but if the present rate of test explosions is continued, it will rise ultimately to some 10 percent of that due to natural sources.

Children are regarded as being more sensitive to radiation than adults, although there is little direct evidence on this subject, except for an indication that cancer of the thyroid may result from doses of a few hundred rad which do not induce this change in adults.

In human adults it is difficult to detect the effect of a single exposure to less than 25 to 50 rem, or of continuing exposure to levels below 100 times the natural levels. The first sign of radiation damage to the bloodforming tissues seems to be a drop in the number of lymphocytes and platelets and the appearance of abnormalities such as bilobed lymphocytes.

Rapid but transient disturbances have been observed in mammals after exposure to a single dose of 25 to 200 mrem. Appropriate biochemical and physiological techniques have, however, only recently been applied to the study of irradiated organisms, and have not yet given a clear picture of what happens to organisms irradiated with small doses or dose rates. Too few mammalian species have hitherto been studied in this respect, and there is a clear need to widen this basis, from which inferences can be drawn concerning man.

Processes of repair play an important role in the final outcome of radiation damage. They are one cause of the existence of a threshold dose (or dose rate) characterized by the fact that this dose or greater ones produce a particular biological effect which does not appear when the dose is less than the threshold. In the latter case, physicochemical events have occurred, but recovery processes have prevented the final appearance of the biological damage. Threshold doses are found for some somatic effects, such as erythema of skin. Other forms of radiation damage to cells, tissues or organisms, however, appear to be cumulative; for instance, mutational damage, once established, is not repaired.

Damaged cells or tissues may be eliminated and replaced by regenerated normal cells, this process being most active in embryos and young animals and in certain tissues of the adult. The affected cells may also re-establish apparently normal biochemical functions. During the process of regeneration of tissues damaged by radiation, malignant tumours may be induced.

The power of repair differs considerably in different organisms and types of cells, and varies to a high degree with the physiological conditions. No chemical treatment has yet been discovered which will induce or accelerate recovery from radiation damage to man. The grafting of blood-forming tissue has so far been successful only in small mammals irradiated with a lethal dose to the whole body, and no attempt to apply this treatment to irradiated man has yet been reported.

Prevention of the effects of radiation is rendered more difficult, and complete protection against it impossible, because changes which already occur during the irradiation lead to later damage. The discovery of chemical protectors, although important theoretically, has not yet yielded methods which appreciably reduce radiation damage to man. At present, effective protection from external radiation sources can only be achieved by adequate shielding or by keeping at a safe distance from the source. Much work is in progress on the effect of certain (chelating) agents in discharging from the body radioisotopes incorporated there, and so diminishing exposure to internal irradiation.

Morphologically recognizable damage may be induced by total or partial, continuous or intermittent irradiations much in excess of the currently accepted "maximum permissible levels" of occupational exposure. Such damage includes leucopenia, anemia and leukemia. Other pathological conditions such as cataract, carcinoma of the thyroid, and bone sarcoma are known to have resulted from partial body irradiations, but with rather high doses involving hundreds or even thousands of rem given to these organs.

The shortening of the life-span in small rodents exposed to large doses has suggested the possibility that certain degenerative processes may be aggravated by continued exposure to low radiation levels. Such a shortening has also been inferred from an analysis of the published death rates of United States radiologists compared with those of certain other groups of medical men. However, studies in the United Kingdom have failed to demonstrate such an effect.

Present uncertainty about the effects of low dose levels makes it imperative that as much relevant information as possible be collected about groups of persons chronically exposed at these levels and for whom adequate control groups exist, for instance, certain populations in areas of high natural radiation and workers in uranium mines.

Exposure of gonads to even the smallest doses of ionizing radiations can give rise to mutant genes which accumulate, are transmissible to the progeny and are considered to be, in general, harmful to the human race. As the persons who will be affected will belong to future generations, it is important to minimize undue exposures of populations to such radiation and so to safeguard the well-being of those who are still unborn.

The present assumption of the strictly cumulative effect of radiation in inducing mutations in man is based upon some theoretical considerations and a limited amount of experimental data obtained by exposure of experimental organisms to relatively high dose levels. This assumption underlies all present assessments of the mutational consequences of irradiation. Therefore, extension of the experimental data to the lowest practicable dose levels is needed.

The knowledge that man's actions can impair his genetic inheritance, and the cumulative effect of ionizing radiation in causing such impairment, clearly emphasize the responsibilities of the present generation, particularly in view of the social consequences laid on human populations by unfavourable genes.

Besides increasing the incidence of easily discernible disorders, many of them serious but each comparatively rare, increased mutation may affect certain universal and important "biometrical" characters such as intelligence or life-span. In this way, it is possible that continued small genetically significant exposures of a population may affect, not only a correspondingly small number of individuals seriously, but also most of its members to a correspondingly small extent. While less easy to detect, this second kind of effect on a population could also be serious. Unfortunately, the great majority of the genes affecting the "biometrical" characters are not individually detectable and so can only be studied collectively and with difficulty. In consequence, far less is known about them than about genes responsible for individually detectable changes and very little indeed about their response to irradiation, even in the best studied experimental organisms. Hence it is impossible, at the present time, to estimate with any assurance the effect upon biometrical characters of any given level of irradiation of human populations. Much further research throughout this field is therefore needed.

The Committee emphasizes the urgent necessity for well-planned investigations which may lead to a better understanding of the mechanism of mutation and the eventual possibility of controlling this process. More information is needed on the effect of radiation in inducing mutations in man. Indeed, even the dose required to double the normal mutation rate in man is not known with any accuracy. There is also need for a much closer cooperation between geneticists and demographers in elucidating the nature of the complex process of human selection. . . .

### General Conclusions

The exposure of mankind to ionizing radiation at present arises mainly from natural sources, from medical and industrial procedures, and from environmental contamination due to nuclear explosions. The industrial, research and medical applications expose only part of the population while natural sources and environmental sources expose the whole population. The artificial sources to which man is exposed during his work in industry and in scientific research are of value in science and technology. Their use is controllable, and exposures can be reduced by perfecting protection and safety techniques. All applications of X-ray and radioactive isotopes used in medicine for diagnostic purposes and for radiation therapy are for the benefit of mankind and can be controlled. Radioactive contamination of the environment resulting from explosions of nuclear weapons constitutes a growing increment to world-wide radiation levels. This involves new and largely unknown hazards to present and future populations; these hazards, by their very nature, are beyond the control of the exposed persons. The Committee concludes that all steps designed to minimize irradiation of human populations will act to the benefit of human health. Such steps include the avoidance of unnecessary exposure resulting from medical, industrial and other procedures for peaceful uses on the one hand and the cessation of contamination of the environment by explosions of nuclear weapons on the other. The Committee is aware that considerations involving effective control of all these sources of radiation involve national and international decisions which lie outside the scope of its work.

Certain general conclusions emerge clearly from the foregoing part of this report:

(a) Even the smallest amounts of radiation are liable to cause deleterious genetic, and perhaps also somatic, effects.

(b) Both natural radiation and radiation from fall-out involve the whole world population to a greater or lesser extent, whereas only a fraction of the population receive medical or occupational exposure. However, the irradiation of any groups of people, before and during the reproductive age, will contribute genetic effects to whole populations in so far as the gonads are exposed.

(c) Because of the delay with which the somatic effects of radiation may appear, and with which its genetic effects may be manifested, the full extent of the damage is not immediately apparent. It is, therefore, important to consider the speed with which levels of exposure could be altered by human action.

It is clear that medical and occupational exposure, and the testing of nuclear weapons, can be influenced by human action, and that natural radiation and the fall-out of radioactive material already injected into the stratosphere cannot.

. . . Many effects of irradiation are delayed. . . . Even a slow rise in the environmental radioactivity in the world, whether from weapon tests or any other sources, might eventually cause appreciable damage to large populations before it could be definitely identified as due to irradiation. . . .

*Any present attempt to evaluate the effects of sources of radiation to which the world population is exposed can produce only tentative estimates with wide margins of uncertainty.*

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## Fetal Anoxia

A team of six doctors from five medical schools will go to the Peruvian Andes this fall for special studies of pregnancy at very high altitudes. The expedition, financed by a grant from the Josiah Macy, Jr. Foundation, will be headed by Donald H. Barron of the Yale University School of Medicine and will include William Huckabee of the Boston University Medical School, Harry Prystowsky of the University of Florida Medical School, Andre Hellegers of the Johns Hopkins Medical School, Giacoma Meschia of the Yale University School of Medicine, and James Metcalfe of the Harvard Medical School. These men will conduct their investigations at the institute of Andean Biology in Morochocha, 15,000 feet above sea level. Alberto Hurtado (Harvard Medical School, '24), director of the institute and dean of the Medical School of the National University of San Marcos, Peru, will work with the group. Hurtado is an authority on high altitude studies.

In Peru, 63 percent of the population live at an altitude of 6000 feet or higher and 42 percent live at altitudes above 9000 feet. In contrast, only 1 percent of the population in the United States live at an altitude as high as 6000 feet.

The greatest single cause of mortality among infants at or about the time of birth is fetal anoxia. The six scientists hope to gain a better understanding of this problem from the Peruvian studies. The team will return to the United States in mid-November.

## Technical Information Center

A Foreign Technical Information Center is now operating in the U.S. Department of Commerce to provide American science and industry with access to translations of a large amount of Soviet technical information. The center is a part of the Office of Technical Services, Business and Defense Administration.

The services of the new center include publication of abstracts of all articles appearing in 141 Soviet technical journals, translations of important sections of *Referativnyi Zhurnal* (the Russians' own abstract journal), and a semimonthly review of various areas of Soviet science compiled by the Central Intelligence Agency. Abstracts of each issue of the 141 journals may be purchased from OTS on a subscription or single-issue basis, as may CIA's *Scientific Information Report*. The various sections of *Referativnyi Zhurnal* will be sold initially by single issues, but subscription sales may be offered later.

The Office of Technical Services, which is directed by John C. Green, will soon begin distributing complete translations of articles and books. Translations will be listed in an abstract journal to begin publication about September.

Much of the material collected by OTS will be from government sources, principally the intelligence agencies. This volume is estimated to run at 50,000 abstracts and 10,000 complete translations a year. Eventually, material from other sources is expected to be added to the collection. Congress appropriated $510,000 for the operation of the foreign technical information program in fiscal 1959.

## Atmosphere and Space

An International Conference on Physics and Medicine of the Atmosphere and Space will be held 10–12 November in San Antonio, Tex., under the sponsorship of the U.S. Air Force School of Aviation Medicine. Participants will include Hugh L. Dryden, director of the National Advisory Committee of Aeronautics, nucleus of this country's new civilian space agency; Joseph Kaplan, physicist from the University of California at Los Angeles who heads the U.S. National Committee for the International Geophysical Year; Fred L. Whipple, director of the Smithsonian Astrophysical Observatory; James A. Van Allen of the University of Iowa, specialist in rockets for high-altitude research; and Gerard P. Kuiper, astronomer at the University of Chicago.

Arrangements for the meeting are being conducted by the Southwest Research Institute. Because of limited facilities, attendance will be restricted to 500 on an invitational basis. For information write to the Southwest Research Center, 331 Gunter Building, San Antonio, Tex.

## Fallout on Japanese IGY Ships

Japan has decided not to send out any more ships for International Geophysical Year oceanographic surveys until the United States suspends nuclear testing in the Pacific. Kanji Suda, chief of the Hydrographic Section of the Maritime Safety Agency announced the suspension after the *Satsuma* and the *Takuyo* ran into radioactive rain and sea water on 14 July following a United States nuclear explosion.

The ships have reported that their positions were well outside the danger zone established by the U.S. Atomic Energy Commission. Suda reported that IGY surveys of sea currents near the equator and of other phenomena were "completely spoiled" by the fallout hazard. The ill crew members of the two vessels have been examined by American and Japanese medical teams, both of which report that the men are unharmed.

## Teacher Exchange

More than 600 teachers from the United States and 42 other countries will take part in the 1958–59 teacher exchange program. Arranged by the Office of Education, Department of Health, Education, and Welfare, the program is part of the United States international educational exchange program of the Department of State. With this year's exchange, nearly 5000 teachers from the United States and 64 other countries will have participated in the program, which is now in its 13th year.

One hundred American teachers from 26 States have left the country to exchange positions with 100 teachers from the United Kingdom. Among the countries participating in this year's program are Australia, Austria, Belgium, Canada, Chile, Colombia, Cuba, France, Germany, Italy, the Netherlands, New Zealand, and Norway.

## Bykov Comments on U.S. Visit

Konstantin Bykov, Soviet physiologist and academician, recently visited the United States to attend the annual conference of the American Psychiatric Association in San Francisco and the Congress of the International Society of Gastroenterology held in Washington. Following his return to the U.S.S.R. Bykov made the following statement:

"My trip to America, which made it possible for me to get a comparatively good knowledge of the work being conducted by a number of research institutes and educational establishments there, was very fruitful. . . . The scientific meetings I went to and the visits I paid to research institutions enabled me to come to the conclusion that American psychiatrists and physiologists are conducting their scientific work on an extensive scale. It gives me pleasure to be able to say that the teaching of our great Russian scientist, Academician