

government are "aid to education." The funds appropriated by Congress are based on the expectation that the country, whose taxpayers are footing the bill, will derive benefits from the research commensurate with its cost. There is a true *quid pro quo*.

Like any organization, universities must recover the costs of the things they do. Student tuitions should certainly not be raised to help pay for government-sponsored research. Endowment income, which is becoming a smaller and smaller fraction of every institution's total income, generally is restricted by the donor of the principal so that it is available only for certain other purposes, such as teaching salaries, instructional materials and supplies, and student assistance. Alumni, private foundations, and industry, the other primary sources of income for private institutions, cannot be persuaded to give money for the purpose of sharing the costs of research undertaken through government grants and contracts. As Warren Weaver very well put it [*Science* 132, 1521 (1960)], it is absurd to insist that these costs "should be provided by 'the institution itself' out of its 'own funds,' as though colleges and universities kept printing presses in the basement."

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Experimental Cancer-Cell Implants in Patients

Your account entitled "Human experimentation: Cancer studies at Sloan-Kettering . . ." (7 Feb., p. 551) leaves the impression that certain facts have been deliberately concealed at the Jewish Chronic Disease Hospital (which co-operated on one stage of the research). Permit me to provide you with more complete information about "what happened in Brooklyn" so that you and your readers may appreciate more fully the true nature of the problem.

At the outset, I may remind you of a very important biologic fact which is not mentioned in your article, namely, that the implanted "cancer cells" represented homologous tissue, and that such tissue is regularly rejected by the recipient unless he is of the same genetic makeup as the donor (for example, an identical twin) or has been exposed to x-radiation or certain drugs that impair the immune mechanism. In view

of the tremendous difficulty of transplanting organs from one human being to another, you will agree that the Southam test is about as safe as any of the routine clinical procedures of comparable nature, for example, the Menthoux test for tuberculin sensitivity or vaccination for smallpox or for typhoid fever. Indeed, the test compares favorably in potential hazard with some commonly used diagnostic procedures known to be associated with occasional serious and even fatal reactions, such as the measurement of circulation time by intravenous injection of decholin, saccharin, or ether, the BSP test for liver function, or the intravenous pyelogram. There was no practical possibility of untoward results to the patients who received injections of homotransplants consisting of tissue-cultured cancer cells derived from other patients. In addition, it should be pointed out that the three lines of cells which were used in the study at our hospital were derived from human tumor tissue 4 to 12 years ago. After such periods of growth in the laboratory, these cell cultures represent standardized biological agents having a high degree of uniformity and predictable reactions.

The injections were given by our senior resident under Southam's supervision after Southam had demonstrated the technique on three patients. Both he and his research fellow witnessed each patient's interview by the resident and found the consent satisfactory.

In accordance with standard procedure adopted earlier by the Sloan-Kettering group, the word "cancer" was not used in the explanations given to the patient. This procedure, approved by top-level executives of Sloan-Kettering Institute and Memorial Hospital, appeared justified because of the potentially deleterious effect which the dreaded word "cancer" may have upon the patient's well-being, as it may suggest to him (rightly or wrongly) that his diagnosis is cancer; and because it was irrelevant in regard to both the principle of the test and the patient's welfare. Many other scientists have endorsed this point of view. Thus, George E. Moore, Director of the Roswell Park Memorial Institute in Buffalo, was reported as fully supporting "the action taken by Dr. Southam in not using the word 'cancer' . . ." (*New York Times*, 22 Mar. 1964, p. 53). Indeed, this action was taken in compliance with conventional procedure in clinical practice. The facts that small-

pox or poliomyelitis vaccines contain "live virus," that exposure to radioactive substances may increase the risk of contracting leukemia, or that the injection of certain iodinated compounds (used in renography), of bromsulphalein, or of penicillin may, on occasion, result in severe illness or even fatality, are usually not imparted to patients before they are subjected to any of these procedures.

What happened in Brooklyn was simply an extension of the Sloan-Kettering research, conducted by Southam with the same techniques used at Memorial Hospital. The medical staff of the Jewish Chronic Disease Hospital unanimously endorsed continuation of the study.

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All Mandel's comparisons are with established clinical procedures such as vaccinations or routine treatments such as penicillin. True, these procedures also carry risks. But they are designed to help the patient. What went on at Sloan-Kettering and at the Jewish Chronic Disease Hospital was not treatment of patients but experimentation on them. It seems to me that this distinction ought to be maintained, and that researchers ought to bear it in mind both when they consider the possibility, practical or theoretical, of "untoward results," and when they are judging whether a patient's consent is or is not "satisfactory."

—ELINOR LANGER

Science as News

The difficulties of covering AAAS conventions enumerated by Raymond A. Bruner (21 Feb., p. 763) may be symptomatic of a trend science is taking—it is becoming more integrated itself and also more integrated with life-in-general. Synthesis and unity may be the dominant underlying movement of this age. One aspect is brought out in a statement, attributed to Defense Secretary McNamara, I think, about the necessity of making facts manageable. In this process, many "shining nuggets of achievement," to use Bruner's phrase, may be lost or momentarily held in suspension, or even, as Bruner seems to imply, discouraged. . . .

It may be that more manpower, planning, and publication outlets are