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9. The supplement contained in each daily portion: (i) powdered egg yolk, 27.8 g; (ii) skim milk powder, 11.3 g; (iii) corn oil (Mazola) 15 g; applesauce, 87 g; apple juice, 31.3 g; and water to make 200 ml. The monkeys willingly drank the mixture from a standard water feeder bottle, and consumed 70 to 80 percent of the formula offered. The amount ingested was determined from measurement of the residual volume daily. The animals had unrestricted access to water. The amount of cholesterol ingested was calculated from the percentage of cholesterol in the formula that had been consumed. Estimation of total caloric intake, total fat intake, and percentage of calories as fat was made by a count of chow biscuits taken daily.
10. At the time they were killed, the animals were placed under halothane anesthesia and were perfused with buffered half-strength Karnovsky's fixative under 100 cm of hydrostatic pressure for 20 minutes in vivo. The arteries were subsequently fixed and prepared for light and electron microscopy.
11. Platelet counts were measured with an electronic particle counter on peripheral blood collected in EDTA (*12*). The platelet count of 20 normal animals was 372,000 ± 62,000 per microliter (± S.D.). Platelet survival was determined from the disappearance of radioactivity from blood sampled five to ten times after the injection of autologous ^{51}Cr-labeled platelets as described previously (*4*). Platelet consumption, measured as platelet turnover per microliter of blood per day, was calculated from the peripheral platelet count divided by the platelet survival time in days and corrected for recovery.

Platelets were determined as follows: 25 ml of whole blood was collected in 5 ml of ACD anticoagulant (acid, citrate, and dextrose) and centrifuged at 200*g* for 10 minutes at room temperature. The supernatant (platelet-poor) plasma was removed and adjusted to *p*H 6.5 with 0.15*M* citric acid, then centrifuged at 3000*g* for 15 minutes to form a platelet pellet. The platelets were then resuspended in 1 ml of supernatant plasma and incubated with 50 μc of radioactive chromium (New England Nuclear) for 20 minutes. Five milliliters of nonradioactive platelet-poor plasma were added and the pellet reformed by centrifuging at 3000*g* for 15 minutes. The resultant radioactive platelet-poor plasma was completely decanted, and the platelet pellet was washed by carefully layering over 2 ml of nonradioactive platelet-poor plasma, and then decanting. The platelet pellet was gently suspended in 3 ml of nonradioactive platelet-poor plasma. Contaminating red cells were largely removed by a final slow centrifugation of 100*g* for 5 minutes. A known amount of the supernatant ^{51}Cr-labeled platelet suspension was returned to the animal by intravenous injection after the preparation of a standard. Eight daily 2-ml samples of whole blood were collected in EDTA, lysed with sodium dodecyl sulfate, and counted for radioactivity in a gamma counter. The proportion of labeled platelets remaining within the systemic circulation after infusion (that is, recovery) was calculated from the platelet activity per milliliter at zero time, multiplied by the estimated blood volume, and divided by the platelet ^{51}Cr activity injected.
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NEWS AND COMMENT

NIH Budget: Senate Committee Holds History's Quietest Inquiry

Some days Congress comes to grips with the world's harsh realities. Other times the nation's lawgivers cut corners and retreat into fantasy.

Take, for example, the scene that opened at 10 a.m. on 3 February this year in room 1223 of the Senate's Dirksen office building. Wielding the gavel is Senator Warren Magnuson (D–Wash.), chairman of the Senate's labor and health appropriations subcommittee. The business of the day is for the subcommittee to cross-examine the senior officials of the National Institutes of Health on the $2 billion they plan to spend for the betterment of the nation's health. And any citizen wishing to learn how diligently that business was performed may do so by consulting the 700-page hearing record which the Senate has published for his edification.*

What does so undramatic a proceeding have in common with the theater of the absurd? Only that it never took place. The appropriations hearings for the NIH and other health agencies were scheduled as usual this year but later canceled. Instead of rescheduling them, the Senate committee hit upon a quite novel way of conducting the public's business. Government health officials were asked to supply written testimony, together with the answers to written questions. Some playwright-manqué on the committee staff then wrote up the material as if the hearings had actually been held.

The script, it should be admitted, is not particularly inspired. The congressional roles, played by Senators Magnuson, Edward Brooke (R–Mass.), Richard Schweiker (R–Penn.) and William Proxmire (D–Wis.), are bit parts with lines that have scarcely a laugh between them.

But the scriptwriter has at least tried to insert a few dramatic touches of his own. For example, he has Magnuson say at one point, "Our next witness will be Dr. Donald Tower of the National Institute of Neurological and Communicative Disorders and Stroke. That's a mouthful."

After further imaginary mastication Magnuson inquires of Tower, "Now that you have communication as part of your name, what new initiatives are you planning in hearing disorders?"

The script to save the committee's hearings disorder places other witnesses in false positions. Donald S. Fredrickson, for example, tells Magnuson that "This is my first opportunity to appear before you as Director of the National Institutes of Health." Fredrickson is followed at the witness table by an insubstantial Frank J. Rauscher, director of the National Cancer Institute, and eight attendant wraiths. The next witness is Robert I. Levy, director of the National Heart and Lung Institute. "Mr. Chairman and members of the committee, it is a particular pleasure for me

*Departments of Labor and Health, Education, and Welfare and Related Agencies Appropriations for Fiscal Year 1977—Part 3. (Government Printing Office, Washington, D.C., 1976).

to be here today," the absent Levy enthuses. At 11.45 a.m. precisely, Magnuson gavels the morning session to a close, having heard, at a machine-gun rate of delivery, some 35,000 words of oral testimony in a mere 105 minutes.

Remarks made by congressmen on the Senate or House floor are often edited before appearing in print in the *Congressional Record*. The practice of editing the truth just a little has slopped over into the hearing record of committees. Often a question asked by a staff aide on behalf of an absent senator will appear in the record as if posed by the senator himself. It is common and necessary practice for witnesses to be asked to supply written answers to certain questions, but some committees print up both question and answer as if the interchange had occurred in the hearing room.

The potential for abuse in these small inexactitudes has been fully realized in the wholesale fiction perpetrated on the public by Magnuson's subcommittee. Rarely if ever has an entire day's hearing been faked, let alone several days'.

Asked for an explanation of the affair, an aide to Magnuson told *Science* that "The Senator is willing to say that apparently the printed record doesn't reflect what transpired and that he has the matter under investigation."

The aide then added that the above statement should be attributed to Magnuson and not to him. To the suggestion that it would be more accurate to say that Magnuson made the statement through an aide, the aide replied that "We would rather you didn't do it that way. The Senator doesn't want aides quoted in the press. That's just our policy and it has been that way for years." The minor emendation of reality seems to be a routine occurrence in Magnuson's office.

How many of the actors connived in the fictitious script? Morton Schwartz, an aide to Senator Proxmire, said he checked in proofs the questions submitted on Proxmire's behalf and that he would have "screamed like hell" if they had been tampered with. Schwartz apparently did not trouble to scream like hell about allowing the public to think that Proxmire had attended the hearing on its behalf.

NIH officials say that they had no chance to protest the fictional use of their testimony because "We had no knowledge that Dirks would write up the material as if it had taken place." Harley M. Dirks is the chief aide to the labor and health appropriations subcommittee. He told *Science* that the hearings into the NIH's budget were canceled because NIH's testimony and witness list didn't reach the committee in time. "With most of the health agencies that was the principal reason," Dirks explains. The delay with the NIH material, he adds, "was mostly the fault of the HEW budget comptroller's office." Charles Miller, deputy head of the office, says he is not aware of any such delay.

As to making dead hearings seem live, Dirks explains that it was his printer who made the original sin of commission. The printshop "worked up" the front pages (which state the time and place of the hearings) in the usual way and "We didn't bother to change it," he says.

Dirks says he received no protests about this procedure from the staff of the subcommittee members or from HEW officials. Miller says he did not protest because it has been "long custom" for written questions and answers to appear as if they had been live, but he agrees that it is "precedent setting" for a whole set of hearings to be so treated. As for Magnuson, he must have wondered how the nonexistent hearings were to be printed up. Was he told of the plan to fictionalize them? "I guess I don't know," says Dirks.

The faking of the record underlines the strong element of playacting in the appropriations process. The President submits a low cost health budget which the officials must pretend to defend, and the senators berate them as if the pretense were real. Both sides know what is going on and only the public is deceived.

"If the exercise is futile anyway, it's a great time-saver to hold the whole hearing in writing," observes an HEW official. But senators, committee aides, and officials who can perpetrate and connive at a paper hearing to fool the public have attained a degree of cynicism at which they must presumably conceive of the public as paper people.

—NICHOLAS WADE

R & D and Economic Growth: Renewed Interest in Federal Role

Since World War II it has been an article of economic faith that research and development are vital factors in technological innovation, which, in turn, is an essential ingredient of economic growth. In recent years, however, there has been a disturbing decline in R & D spending in the United States, a lag in innovation, and a slowdown in economic growth.

One result is that a group of economists and analysts who specialize in the study of the relation of R & D to economic growth are being increasingly consulted and courted by legislators and policy-makers. What this seems to presage is a serious renewal of interest in Washington in the question of what measures can be taken by the federal government to encourage technological innovation in private industry.

One observation that has attracted the attention of the seekers of wisdom and been given prominence in the press is that investment in R & D by private industry brings a decidedly favorable return, probably in the range of 30 percent, on the average. If this is the case, it seems unaccountable at first blush that manufacturing companies, which enjoy such returns, don't plow money into R & D.

The catch is that the estimates apply to average rates of return—for industries in most cases—and that a particular R & D project carried out by an individual firm may bring a much more modest return or, in fact, be a total loss. Economists who work in the field emphasize the risks involved in R & D and say it is by no means clear that private firms, from the standpoint of their own interests, are underspending on R & D.

What then is really known about this seemingly paradoxical situation? Edwin Mansfield of the University of Pennsylvania's Wharton School of Finance, and one of the most widely known of the economists identified with the economics of R & D puts it this way: The rate of social return on R & D spending—the benefit to society as a whole—is known