makers should not be compared to the ionizing radiation devices, operating-room machines, or contact lenses, which I am sure make up the bulk of the billion-dollar sales that were mentioned. A heart valve which now costs about $300 is probably one of the greatest bargains there is, considering the vital function it performs. While I agree that many products, such as oxygen tanks and monitoring devices, could be further improved and premarketed, they do not in any way compare with sophisticated devices such as heart valves and pacemakers. The record of achievement in cardiac surgery and heart valve development has been one of the more dramatic and successful endeavors of the medical profession.

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## Heart Panel's Report

On 4 April 1972, President Nixon appointed a panel of 20 experts "to determine why heart disease is so prevalent and so menacing and what can be done about it." The President's Advisory Panel on Heart Disease met for the first time on 18 May 1972 and learned from its chairman, John S. Mills, that the President expected a final report from the panel on 1 September of the same year. By extraordinary efforts on the part of every member of the panel, its chairman, the staff assigned to it, and many consultants and advisers, the report was completed and sent to Assistant Secretary Merlin K. DuVal, Department of Health, Education, and Welfare, on 1 September. It was sent to President Nixon 6 weeks later.

It has now been more than a year since submission of the panel's report to Assistant Secretary DuVal, and the White House has not yet made the panel's recommendations public, although speedy completion of the report was presumed to be urgent for national planning of the attack on heart disease and to complement the attack on cancer. Because the report and its recommendations were addressed to the President and classified from the start as "confidential," and since no member of the panel "leaked" any portion of the report to the press, we have the fascinating situation in which, as far as I know, no member of Congress, even those charged with developing a budget for the National Heart and Lung Institute, has seen the report or knows of its contents.

I am not concerned with whether the report was brilliant or unimaginative. I am concerned that the report required the time of many experts (conservatively estimated at 5000 working days—days that were diverted from a variety of important activities) and that it required several hundred thousand dollars of taxpayers' money. For what?

It seems that there are two ways of preventing a similar waste of scientists' time and taxpayers' money in the future.

1) Whenever the Executive or Legislative branch of the government appoints a special panel, commission, or committee to study a problem and make recommendations to it, the report should be simultaneously available to each branch, unless it can be clearly and unquestionably proved to be classed as confidential or secret. This would eliminate costly duplication of effort and prevent bottling up of recommendations not to the liking of the branch that initiated the request. Such reports should be made public within 2 months of submission, after each branch has had time to study the report and, if it wishes, prepare comments to accompany it.

2) Whenever scientists are asked to serve on such a panel to prepare a report on unclassified matters (such as the health of the nation), they should agree to serve only if it is clearly understood that their report—good or bad—will be available both to the Congress and to the Executive branch and, within a reasonable time, to the public.

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## Computer Systems

Thomas H. Maugh II (Research News, 19 Oct. 1973, p. 270) refers to large "computer systems like the IBM 360 or the PDP-10." The IBM 360 is a series of machines ranging from the small 360/20 to the very large 360/195. The DEC PDP-10 is a medium-sized to large computer system but is not typical of the large computers used in big scientific applications.

Maugh states that the maximum memory capacity of a minicomputer is about 8000 words, whereas the typical capacity of a large computer is several hundred thousand words. The DEC PDP-8, one of the earliest and smallest mini's, has a capacity of up to 32,000 words (384,000 bits), whereas the IBM 360/30, an extremely popular medium-sized machine, has a maximum memory capacity of only 16,000 words (512,000 bits). (The discrepancy is because the 360/30 has 32 bits per word; the PDP-8 has 12.) The sizes of computer memories are best compared in bits or bytes, as word lengths vary from less than 12 bits to more than 128; but, more important, the size of a computer is determined by its data-path widths, channel capacities, memory speed, and so forth, as well as its memory capacity. One of the most powerful computers, the CDC 7600, has a main memory capacity of only 64,000 words.

Maugh implies that large computers require sophisticated programming skills and that minicomputers are too inflexible. If anything, it is the mini's that require sophisticated programs because they lack adequate software. Any computer can be programmed so that an operator need only push a few buttons. The trick is to find a computer small enough to have a low net cost yet large enough to handle the load. To do this, purchasers of computers should have the software, hardware, local programming skills, and the application thoroughly evaluated by competent professionals.

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## "Back-to-the-Wall" Effect Continues

Two years ago (Letters, 19 Nov. 1971, p. 774), I noted the unusual frequency with which the World Series has lasted seven games since the end of World War II and pointed out that this was associated with a highly improbable sequence of outcomes in the sixth game. I also noted that there are very real philosophical difficulties in interpreting peculiar or unique numerical phenomena when they are defined after the fact of their occurrence.

These difficulties are well recognized. For example, William Prout (1785–