Marv — This may interest you: Government funding and patentability. Bruce Marsh,

Science Jan 12, 1979

LETTERS

Technological Innovation

I was extremely interested in William D. Carey's editorial "Science in the political economy" (17 Nov. 1978, p. 703). I agree with the assessment that the budget restraints we are facing make it critical that the money spent by the federal government for research and development bring the greatest possible return. Not only should we be selective in our research funding, but we must also create the best climate for bringing the fruits of federal research to the people in the form of new products and technology. Unfortunately, the present policy of federal government retention of patent rights on inventions arising out of federally supported research has resulted in many promising inventions being left to gather dust on the shelves of government agencies. Less than 4 percent of the patents held by the government are ever successfully licensed. This is not a very good return for the billions of dollars we spend on R & D.

There is another trend that has been commented upon in the past in *Science* and is succinctly expressed by this headline, which appeared in the Washington *Post* on 24 November 1978: "U.S. Seen Losing Technological Edge in Some Industries." Because the government provides such a large percentage of all the R & D expenditures in the United States, an inefficient policy which stifles inventiveness hurts our companies who need new technological ideas to compete successfully with increasingly tough foreign businesses.

In the last Congress, I joined a bipartisan group of senators in introducing a bill we feel will answer at least part of these problems. This legislation, the University and Small Business Patent Procedures Act, will allow universities, small businesses, and nonprofit institutions in most cases to retain patent rights for those inventions and processes if they are willing to spend the necessary private funds to develop and market a final product. At the same time, the bill will protect the legitimate rights of the government to enjoy the fruits of the research it helped to fund.

There are now 20 statutes and regulations in effect that give contradictory instructions to the agencies about their ability to grant patent petitions. Sometimes, even within the same agency, there can be different policies among various divisions. The result has been that researchers face a costly maze of confusing rules, many of which require the agency that helped fund the research to also retain the patent rights for any inventions arising from it.

Early in the next Congress, Senator Robert Dole (R-Kan.) and I again will lead the bipartisan effort to pass this legislation. I realize that getting the most out of our R & D money and the problem of our slumping rate of technological innovation are extremely complex areas. This bill would be an important first step in turning this situation around.

BIRCH BAYH
U.S. Senate, Washington, D.C. 20510

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Nitrite in Cured Meats

Philip E. Hartman (Letters, 20 Oct. 1978, p. 260) responds to the article by R. Jeffrey Smith (News and Comment, 8 Sept. 1978, p. 887), which says researchers have estimated that less than 20 percent of the nitrite entering the human stomach is derived from cured meats. Hartman cites a publication by White (*1*) giving a figure of 21.2 percent and considers this the best currently available information. On the basis of White's estimate that cured meats contribute 9.4 percent of ingested nitrate and other evidence that some of the dietary nitrate is absorbed by the body, secreted in the saliva, and then reduced to nitrite in the oral cavity, Hartman suggests that the nitrate in cured meats may "possibly contribute an additional 6.8 percent of gastric nitrite." Adding this figure to White's value of 21.2 percent, Hartman obtains a total of 28 percent.

Hartman's estimate appears to be too high. The data on which it is based overestimate the current exposure to nitrite and nitrate in cured meats because they are based on analyses of cured meat samples taken years ago. Nitrite and nitrate residues in cured meats are now reduced because of recent changes in manufacturing practices.

S. R. Tannenbaum *et al.* (Reports, 30 June 1978, p. 1487) found that nitrite and nitrate are formed in the human intestinal tract. Hence, the human body as a whole is exposed to more nitrite- and nitrate-nitrogen than enters the stomach from the oral cavity. On the basis of the data by White and Tannenbaum *et al.*, I estimated (*2*) that as much as 2 percent of the exposure of humans to nitrite in the United States is a consequence of consumption of meats cured with nitrite. The remaining 98 percent of the exposure is from other sources, which seem to be almost exclusively dietary nitrogenous substances other than nitrite that undergo transformation in the digestive tract with production of some ni-