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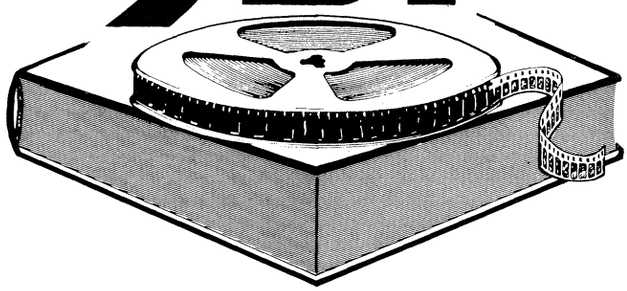

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# SCIENCE





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**COVER**

Galápagos penguins. The male (right) is preening the head of the female (left), who is self-preening. See page 1481. [P. Dee Boersma, University of Washington, Seattle]

30 June 1978, Volume 200, Number 4349 **SCIENCE**



# Patent Policy Versus Innovation

The United States is engaged in a massive research and development effort which, measured in current dollars, is edging close to the level of $50 billion annually, counting outlays in both the federal and the private sector. The budget for R & D in government calls for more than $28 billion in the next fiscal year. There is no doubt that the R & D input is strong. The *output* side may be a very different story.

We support R & D to learn something that we do not know, and to make use of what we learn. Like any other type of investment, R & D is expected to yield returns. In the case of government-financed R & D the question arises, Are the investors getting full and timely return? Are the results of federally funded R & D finding their way into the market?

The evidence, as usual, seems mixed. About 8000 inventions are said to be generated each year from government-financed R & D, many of which are patentable. Not enough of these apparently reach the market. Some 30,000 government-owned patents are piled up awaiting takers. To that extent, the national economy is not being enriched and utilization is forestalled. It is a baffling situation until one realizes that the blockage occurs largely in the government's patent policy.

The government operates on the proposition that the economic rewards from federally funded R & D should be captured by the government, or shared only grudgingly with others, since public funds were used. The view prevails that if rights to the discovery were released to private developers on an exclusive basis unreasonable private enrichment could occur. There is scant evidence to support these apprehensions, but the doctrine is riveted into the government's thinking. The effect is that the market incentive to develop government-financed discoveries is circumscribed and inventions are isolated from normal risk-taking and pursuit.

It is not hard to see how this can inhibit the prospects for pass-through of discoveries from biomedical research or energy-related R & D. We see a prodigious R & D enterprise, fueled by tax dollars, constrained from diffusing its results because of a public policy barrier. Throughout the enterprise, discoveries sit stranded and aging. Meanwhile, we search for clues as to what is wrong with U.S. technological innovation, and how it is that foreign industry can undercut American competitiveness and employment.

As usual, public policies are muddled, conflicting more often than complementing one another. In the new study ordered by President Carter of the problems assailing industrial innovation, a fresh opportunity is provided to reexamine both the premises and the consequences of government patent policies. There is ample evidence that the costs of producing and marketing an invention are many times as great as the outlays on the R & D that led to the invention. Not many developers will take these risks with inventions resulting from federal R & D, in the absence of clear ownership.

It begins to appear that we have thought of "science policy" too much in terms of stimulating R & D and too little in terms of liberating its results. The benefits of federally funded R & D are hard enough to realize without the added drag of a dubious policy on patents. A public which is regularly lectured on the promise and performance of science may not be grateful to learn that government's rules are blocking research applications. That could be far more harmful to science than the Golden Fleece awards.

Public policy, if wisely designed, can stimulate economic pursuit of government-financed inventions while at the same time minimizing the risk of abuses. What is clear is that the present patent policies will not get us innovation, nor health and energy benefits, nor economic growth, nor trade competitiveness. We can hardly make the case that R & D contributes significantly to the nation's economy if, at the same time, we isolate its results from utilization. Here is a notable "Catch 22" in federal R & D policy, and it is time to bring it into the open.—WILLIAM D. CAREY

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Manuscripts submitted to *Science* for consideration for publication can be handled expeditiously if they are prepared in the form described in these instructions.

Submit an original and two duplicates of each manuscript. With the manuscript send a letter of transmittal giving (i) the name(s) of the author(s); (ii) the title of the paper and a one- or two-sentence statement of its main point; (iii) the name, address, and field of interest of four to six persons in North America but outside your institution who you think are qualified to act as referees for your paper; (iv) the names of colleagues who have reviewed your paper for you; (v) the field(s) of interest of readers who you anticipate will wish to read your paper.

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All papers submitted are considered for publication. The author's membership or lack of membership in the AAAS is not a factor in selection. Papers are accepted with the understanding that they have not been published, submitted, or accepted for publication elsewhere. Authors will usually be notified of acceptance, rejection, or need for revision in 4 to 6 weeks (Reports) or 6 to 10 weeks (Articles).

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Avoid specialized laboratory jargon and abbreviations, but use technical terms as necessary, defining those likely to be known only in your field. Readers will skip a paper they do not understand. They should not be expected to consult a technical dictionary.

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*Paging.* Use a separate page for the title; number it page 1. Begin each major section—text, references and notes, and figure legends—on a new sheet. Put each table on a separate sheet. Place figure legends and tables after the references.

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