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group and that such extension is not in public interest or in the interest of scientists. In support of this contention the following observations may be made. Anyone can claim a copyright on almost any arrangement of words and bring a charge of infringement against anyone who uses a similar arrangement, even though it is original with the latter person or was taken from the public domain. Since the first test of the validity of a copyright must be made in court, the threat of litigation, especially by one with greater financial resources, and the difficulties of proving originality by the accused as compared with the ease of showing similarity by the accuser put a powerful weapon in the hands of the accuser. With the accelerating rate of publications, more similarities among original writings are bound to result, and thus more charges of infringement where none has occurred. Also, a copyright may be misused to try to prevent the free flow of ideas, although an idea cannot be copyrighted. Hence there seem good reasons for not enlarging the privilege of copyright. With respect to scientists in particular, the extension of the life of a copyright would bring no benefit, for the accelerating rate of scientific developments makes it most unlikely that a scientific writing will command royalties or be in demand after 56 years. Scientists and the general public would be better served by a revision of the copyright law requiring a specification of the portions on which copyright is claimed, where it is not all original or where a copyright has expired on part of it—under penalty of voiding the copyright on the whole thing if a false claim is made.

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Overhead and Research Grants

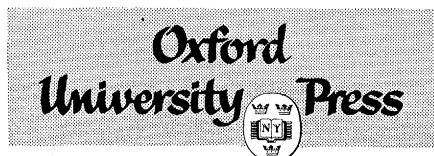
The recent AIBS predicament [*Science* 139, 317, 392 (1963)] put the spotlight on the rapidly growing, cancerous, "overhead" situation in U.S. science. It seems timely for someone who is not dependent on this source of income to point out what is happening.

"Overhead" of some sort is a justifiable feature of applied science contracts, where the government, or an industrial concern, requires that certain

work be done and must bid in the open market for the services of an institution with the necessary facilities and capacity to do the work, or build its own facilities with this capacity. This kind of science, if it can really be called science, does not differ from any other sort of commercial or economic activity. Whether the compensation is called "overhead" or "commission," it is essentially a cost-plus arrangement, and the amount of compensation is determined by the state of the market.

Fundamental science, formerly called "pure science," has come to be subject to the same profit motives. Research was once considered to be one of the normal functions of universities, museums, institutes, academies, and other intellectually oriented organizations. The authorities of such institutions were more than happy when their scientists were able to get grants-in-aid to enable them to carry on this function and considered it a normal part of their own duties to take care of the bookkeeping. We were outraged when we heard of a tight-fisted university administration demanding a 7½ or 10 percent "overhead" to cover the cost of these services.

However, the pattern was set by the contracts for "testing," "research and development," and other applied activities that required the services of scientists or technicians, and the demand for a cut of the pie spread to contracts and grants for strictly fundamental research—research which the scientists wanted to do because of their own intellectual interests. As granting agencies grew to handle the awarding of the increasing government support to pure science, they tended to be staffed by professional scientific administrators, often coming from the agencies that had handled defense and other applied contracts. The idea of overhead was not new to them, and they had also brought with them the businessman's distrust of the people with whom he deals. They were not any more willing to trust the scientist grantee to handle his own grant than they had been to trust the commercial chemist who had been employed to develop a new pesticide or the engineering company that had built a missile. They demanded the assurance provided by an institution that the scientist would not abscond with the money, spend it on wild parties, or take his family on a vacation. The



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fact that the value of the work they were supporting depended entirely on the same man's honesty was apparently never given a thought. For the assurance of financial responsibility they were willing to pay an appreciable percentage of the total funds available for their grants.

The fiscal authorities of the universities were not slow in seeing the possibilities in this situation. They began to scrutinize their own operations for "indirect costs." These commenced to mount with no relation at all to any change in the work performed by their bookkeepers. The contrast between the 10 to 15 percent overhead allowed by the pure science granting agencies and the 50 to 120 percent allowed on applied science contracts became evident, resulting in pressure, on the one hand, on their scientists to work on "useful" projects, and on the other, on the agencies financing fundamental research for higher overhead. It was inevitable that the possibilities in the use of "overhead" for purposes for which it was never intended would be discovered. An early one, and certainly not an undesirable one, was the attempt by certain universities to build up a fund to provide continued employment between contracts for the professional staff hired for contract work. Such foresight was never widespread and was soon discouraged by higher authorities controlling these institutions themselves, who could not tolerate the idea of this money lying unused. The practice of using the overhead money to finance scientific or other activities which were outside any approved program of the granting agencies was not long in following. The AIBS, admittedly one of the guilty ones, happened to be the one that got caught and made an example of.

I think that it is time to look into the whole overhead situation in pure science grants. NSF officials readily admit that the number of meritorious proposals submitted exceeds their capacity to finance them. They have to reject, because of lack of funds, projects they would otherwise be glad to support. If overhead did not eat up 20 percent of the available funds, 20 percent more work could be supported. The man-hours that go into the preparation of these lost proposals are both a source of frustration and a dead economic loss. In addition to this, another sinister factor has crept into the situation. Panels of scientists, who are

supposedly evaluating proposals on their scientific merits, are allowing the size of the overhead demanded by an institution, what is known of its use of the overhead money, and whether or not the institution normally supports a particular kind of work, all to influence their decisions about the relative merits of the proposals they are judging. This can be described in no other terms than as a perversion of the function of these panels.

The practice of allowing overhead on scientific grants and contracts, except those of a strictly commercial nature, should be abandoned. Abandonment would make at least 20 percent more money available to support meritorious projects. It would, at one stroke, eliminate proposals that are developed because of pressure from administrative authorities rather than because of interest by the scientists themselves. And it would bring out into the open the financial problems of worth-while scientific institutions. The legitimate administrative expenses of these institutions would have to be obtained by the same kind of procedures as the funds for scientific work, would be subjected to the same sort of scrutiny as that given to the scientific budgets, and would have to be justified in the same ways. Such administrative expenses would doubtless decrease materially. We might even be treated to the phenomenon of an administrator not having as many secretaries and clerks as he needed, because he could not afford them. This has long been a common situation with scientists. If the so-called indirect costs were real and legitimate, they could and would be met by appropriate grants. Equally, the costs of maintenance and care of collections, libraries, natural areas, and other facilities for scientific work could be honestly appraised and provided for. If the government is in the business of supporting scientific research, as it obviously is, this should be admitted. The support should be adequate; opportunity for control over the directions pure science may take should be minimized; and the processes of empire-building should at least be brought out into the open, so the empires would stand or fall on their merits, rather than be allowed to take place back in the shadows where funds can be manipulated and things may not be what they seem.

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