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University Technology Transfer: Evolution and Revolutions

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**COUNCIL
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*50th
Anniversary
1948-1998*

INTRODUCTION

ON THE OCCASION OF THE 50TH ANNIVERSARY OF THE COUNCIL ON GOVERNMENTAL RELATIONS, it seems appropriate to think about the evolution of some of the issues that are important to research universities and about COGR's role in shaping them. We, therefore, invited papers on several subjects and received responses from seasoned colleagues who wish to share their recollections with us.

Robert Rosenzweig chose to write about "The Politics of Indirect Costs". His observations based on his role as President of the Association of American Universities, working in partnership with COGR, may surprise many readers. Dr Rosenzweig describes how after 1983, the indirect cost debate ceased being about marginal costs versus average costs, or depreciation versus use allowance; or any other accounting matter. Rather, the debate became focused on the nature of indirect costs and its relationship to the federal budget. This new focus transformed the debate into one about politics. The detail of the events during these years of intense conflict is a fascinating chronicle. The author concludes that it is high time to give up the fantasy that the government is a "partner" in the research enterprise, at least in the traditional sense of the word.

Howard Bremer's involvement in university patent activities predates even the decade prior to the passage of the Bayh-Dole Act in 1980 which, in current terms, is the groundbreaking beginning of the history of technology transfer in research universities. Therefore, he chose to title his essay "University Technology Transfer: Evolution and Revolution". Mr. Bremer's technical expertise and historical experience are unmatched. In addition to measuring the success of technology transfer in terms of quantitative data, he reminds the reader of the academic benefits inherent in the technology transfer process. He chooses the metaphor of a loom for weaving into a substantive fabric the wisdom derived from the conduct of basic research with the enlightened cooperation between universities, industry and the government. Far from using rose colored glasses, however, he traces the difficult and drawn out legislative and regulatory development process and COGR's involvement in it. The reader is reminded of the strong forces that objected to the passage of the Act, and should heed the author's warning that the present too holds its dangers.

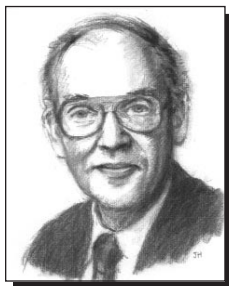
Julie Norris and **Jane Youngers** are nationally recognized not only as observers, but also as active participants and forceful commentators on the research administration enterprise.

Their account of the development of sponsored research offices in universities traces the upward curve of increasing federal regulatory requirements. Readers may nod and smile as they remember their own involvement in various stages of these decades, or they may relive the frustration of fighting the increasing regulatory burden. COGR represented the interest of its membership throughout the development of the regulatory framework for grants and contracts. COGR's various successes, some in giant strides, others measured in baby steps, are vividly recalled. Julie and Jane do not stop at the present, but conclude their essay with a view into the future and a mandate for the universities to enter the electronic age.

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THE POLITICS OF INDIRECT COSTS



ROBERT M. ROSENZWEIG

Benjamin Franklin once wrote that the Constitution might not last forever, but that death and taxes would forever be with us. To those who have been attentive to the relationship between the federal government and the nation's universities since the end of World War II, indirect cost recovery deserves a place on that short list. Like the first two, the problem of indirect costs is inherently insoluble, and also like them, it excites extraordinary passions among people who are normally quite peaceable and reasonable.

Here, for example, is an excerpt of a letter I received, while president of the Association of American Universities, from a faculty member at Stanford, a distinguished scientist with whom I had—I thought—a friendly relationship:

“Your [remarks] so angered me that I felt compelled to comment on what I consider a totally unacceptable position based on your lack of knowledge of the ‘real world’...For you to argue that federal support of facilities construction is needed at this time, and that high indirect costs on research grants are justified...is a clear indication that either you don’t know what is going on, or you have a bias that is clearly contrary to that of virtually all responsible scientists. Those of us on the faculties of universities know that excessive indirect costs are largely due to incompetence and mismanagement, and the inability of University Presidents to apply minimum standards of performance to their administrative and support personnel comparable to those commonly found in industry. Your recommendations would make a bad situation even worse! Disgraceful!”

As a veteran flak-catcher, I would place that and some others like it somewhat below the standard set by the student anti-war movement in the 1960s, but close to the level reached by Stanford alumni outraged by the university's decision to stop making fun of Native Americans by making them the symbol and mascot of its athletic teams. The passions excited by those two issues were, at least, easy to understand: the Vietnam war and the draft were enough to make anyone angry, and alumni emotions were really only an expression of grief for the passage of the university they had known and its replacement by a new and bewildering kind of institution. My faculty friend, though, had worked himself

up over the interpretation of a set of government cost principles. Moreover, eventually the Vietnam War and the draft ended, and Stanford alumni accepted, however grudgingly, the loss of their cherished symbol and the reality of the new university. The concern over indirect cost recovery has never passed, has rarely abated, and even after fifty years of efforts to get it right, still eludes solution and elicits anxiety, anger, and righteous indignation.

In this paper, I will try to explain why a set of accounting principles, described, even by those whose occupation requires them to work with it, as “arcane”, has had such power. I will do this by first looking at the natural history of the issue, as dispassionately as possible, and then by a bit of autobiography. Like many people who have been involved in public events, I like to think that my view of them sheds some valuable light that doesn't come from any other source. Real historians are rightly wary of such egocentric fancies, and treat them not as history, but rather as some of the data from which history can be written. I will offer mine in that humble spirit.

A Brief History of Indirect Cost Policy*

The system of cost-based reimbursement under which the government support of research ostensibly operates was not an inevitable development. It required, first, the decision to support post-war research in universities, rather than exclusively in independent laboratories. The influential report of Vannevar Bush, *Science, The Endless Frontier*, laid the foundation for that decision and also for the principle that universities, in the conduct of government-sponsored research, should be neither unduly taxed nor rewarded. The dominant role of the military in organizing and funding wartime research made the armed services also the dominant sponsors of early post-war research. The most active agency was the Office of Naval Research. Thus, as Goldberg says, “In 1947, the Office of Naval Research...and the universities negotiated the first formal set of principles for determining applicable research costs. These principles relied on the actual costs reflected in a university's annual financial report and introduced the use of a campus-wide average rate, deliberately eschewing the use of marginal cost rates.”

In 1958, those principles were codified in Bureau of the Budget Circular A-21, and the major elements of that document have not changed since then in spite of a large number of revisions in the intervening years. They are: flexibility to account for varying institutional circumstances, the use of generally accepted accounting principles, the need to justify and document costs, the need to develop methods to separate teaching and research costs, the specification of certain unallowable costs, and a simplified reimbursement method for institutions with only a small amount of federal support.

Had the military remained the dominant patron of research, it is quite likely that the reimbursement of indirect costs would not have come to be charged with so much controversy. Arguments there would have been, to be sure, over the allowability of this or that category of cost or method of calcu-

* In 1988, Milton Goldberg, the Executive Director of COGR, prepared a brief history of OMB Circular A-21 for the members of the Ad Hoc Committee on Indirect Costs of the Association of American Universities, better known as the Pings Committee, after its chairman, Cornelius Pings, Provost of the University of Southern California. Goldberg's paper is still the best short chronology of Circular A-21 that I have seen. For what follows here, as with so much of what I think I know about indirect costs, I am indebted to Milton Goldberg.

lation, and the difficulty of allocating costs in universities where teaching and research are done by the same people in the same places would have remained. But the culture of military sponsorship, dominated by its relations with industry, would have supported a cost-based system of reimbursement. As time passed, the small number of universities that kept one of the armed services as their rate-setting agency generally experienced smoother relations than did the bulk of the universities for which the Department of Health, Education and Welfare (later Health and Human Services) came to play that role. Indeed, there were even instances in which universities tried, unsuccessfully, to change their cognizant auditor to a DOD agency.

However, change came and the management culture of the Department of Health, Education and Welfare could hardly have been more different from that of the military. It was a granting rather than a contracting culture. Unlike the military, in which research was seen as a product that had to be bought in the interests of national defense, the social services tradition was that of the grant-in-aid, to enable the recipient to do something that the recipient would be doing even without the grant, though perhaps at a slower rate or a lower level.

That difference was reflected in the earliest arrangements for the payment of indirect costs. From 1950 to 1963, HEW set a fixed upper limit for indirect costs on grants. Until 1958 the limit was 8%. In 1958, it was fixed in law at 15%, then raised to 20% in 1963. Finally, in 1966, the limit was removed in exchange for a requirement of mandatory cost sharing on grants. Also during that period, HEW, primarily through the National Institutes of Health, was growing into the largest patron of university research, and it was becoming the rate-setting agency for virtually all universities. As a consequence, the early tradition of cost-reimbursement gave way to a new and eventually dominant outlook of cost sharing combined with a subsidy, rather than procurement. It must be emphasized that these changes took place under the very same A-21 cost principles used by the military, with no articulated change in policy—save for the requirement of cost sharing. It was a train wreck on its way to happening.

The 1966 amendments to Circular A-21 masked the reality of the change because they appeared to move in the direction of a cost-based reimbursement system to which all agencies that sponsored research would have to adhere. In fact, however, they set in motion a cycle, which continues to this day, in which university administrations argue that the rules require full cost reimbursement (less some amount to be shared) and then feel aggrieved, even righteously indignant, when government officials, in the process of inventing new ways to reduce reimbursement, assert that they have never in their lives heard of such a foolish idea.

Since the ceiling was removed in 1966, the struggle over what A-21 does and does not mean has been unremitting. It takes place at the micro-level in negotiations over each institution's indirect cost rate and at the macro-level in policy battles over efforts by one side or the other to change the terms of the engagement.

Underlying the struggle at both levels has been a growing concern over the plain fact that the removal of the ceiling and the opportunity to negotiate indirect cost rates has allowed those rates to rise. That has had two major effects, both having profound political consequences. First, indirect cost rates came into play in the deficit-reduction wars that began in the 1980s. And second, rising rates combined with the flattening of the growth curve for research funding—also in the 1980s—to bring faculty into the fray, largely on the side of those in government who wanted to slow or reduce the

growth of the rates. As a result, the dynamics of the struggle over indirect costs changed dramatically. Over the years, university administrations had won most of those battles. However, they now found themselves fighting not only gimlet-eyed government negotiators and auditors but fearful and angry faculty on their own campuses and in the Washington debates. As we shall see shortly, the change was profound.

One further piece in the history of Circular A-21 will complete the foundation. In 1982, the Circular was amended once again, this time to allow, among other things, the charging of interest costs directly associated with the construction and renovation of research facilities. This was an especially important change for private universities. In the late 1960s, the government, with some specialized exceptions, had essentially stopped subsidizing research facilities. The infrastructure was growing older, while the science it was required to support grew more complex, and more dependent on instrumentation for which the older facilities were increasingly inadequate. The ability to charge interest on construction as an indirect cost provided a stream of revenue against which universities could borrow—usually at tax-exempt rates. It set off a building boom on major university campuses that surely improved the nation's research capacity, but also made the major private universities dependent on indirect cost policies and vulnerable to changes in them to a degree that sometimes approached desperation.

Choreographing the Issue

To understand the course that the battle over indirect cost policy took it is necessary to understand the parties involved in the battle. The language most often used to describe the conflict over indirect cost policy makes it seem as if there were two combatants—universities and the government, the former represented by their administrations and the latter by negotiators and auditors. The reality is several orders of magnitude more complicated. Three other groups are involved, and it is in the interaction among the five that policy is made. The first group is the faculty of the universities. As indirect cost rates began to rise in the 1980s, largely as a result of the liberalized rules for charging facilities costs, scientists began to be alarmed about the effect of higher rates on their competitive position in the search for grants. Concern became alarm, and then organized alarm, as appropriations for research became tighter and competition for grants became stiffer. Those concerns were especially acute among scientists who looked to NIH and NSF for their primary support. Scientific societies, led by the Federation of Associated Societies of Experimental Biology (FASEB), became active advocates for policies to restrain indirect cost rates so as to provide a larger number of research grants and a higher proportion of each grant for the direct costs of the research. It became common for representatives of university presidents to appear before a Congressional committee or an agency review group and to meet, coming or going, scientific society representatives arguing the opposite position.

The scientists were aided in their efforts by a second group, the program managers of the research-granting agencies. No program officer ever found satisfaction in thinking about the amount of money his or her agency was providing for indirect costs. Professional satisfaction comes from supporting good scientists doing good science. Finding the wherewithal to run the university in which that takes place was the university's problem, not theirs.

That is perhaps an overstatement, but it is close enough to the truth to make the point that scientists and their agency patrons had similar interests and a similar agenda. Students of public adminis-

tration long ago identified what came to be called ‘the iron triangle’; the alliance between agency patrons and those seeking their patronage constituted two sides of the triangle. The third side contained the congressional committees responsible for the program and budgets of the agency. Each side reinforced the other in their common desire for higher appropriations: the source of professional satisfaction, status and power.

It was frequently argued during my years at AAU that university administrations needed to do a better job of educating their own faculties about indirect costs—what they are, how they are calculated, and why they are important. It was hard to argue against the value of better education, but the implicit assumption that lay behind the argument always seemed to be innocent of an important reality, namely that faculty believed that their interests and those of university administrations were actually in conflict. On campuses with high rates, it was virtually an article of faith that any further increase would result in a loss of grants to scientists whose institutions had lower rates. One could always find anecdotal evidence of one or another applicant who believed that his grant would have been approved but for his institution’s outrageous indirect cost rate, but anything approaching the quality of evidence that would pass muster in a peer-reviewed publication was lacking. Nationally, scientific associations believed that lower rates would result in smaller average grant totals with a larger proportion allotted to direct costs and, overall, a larger number of grants. As we shall see, however, the government’s interest in lowering indirect costs came from the desire to reduce the budget deficit. Therefore, it always seemed unlikely that money saved by reducing indirect costs would produce anything other than a reduction in the overall research budget. But beliefs rooted in self-interest are hard to shake, and progress in changing them required more than seminars on the meaning of the indirect cost rate.

Finally, in the choreography of this issue, it should be noted that the university community was, itself, far from a seamless whole in its approach to indirect cost policy. The most obvious division was between public and private universities. In general, the rates in the latter were significantly higher than those in the former. There was no mystery about this; in most public universities state appropriations paid the bills for many of the costs which private universities billed to the federal government. Moreover, in some instances, reimbursement for indirect costs went into the state’s treasury rather than the university’s coffers. In either case, public universities had much less incentive to do the work necessary to document higher rates. It was not that one set of institutions was more efficient than the other, or that the actual costs in one were significantly lower than in the other. Rather, it was simply that public and private universities had different sources of funds for their operational budgets, and the difference affected the way in which both viewed the issue of indirect costs.

For an organization like AAU, whose members were evenly divided between public and private universities, this was a potential source of real trouble. In practice, though, at least in my experience, the potential for trouble was never realized. With occasional grumbling about the amount of time and effort the organization was devoting to the issue, public university presidents recognized the importance of the issue to their private colleagues, and were prepared to defer to them. That generous impulse was strongly reinforced during the 1980s, when very tight state budgets put a clamp on spending for higher education and public universities began to look to indirect cost recovery as an important source of revenue. This combination of collegiality and self-interest made a potentially difficult political problem no problem at all.

The View From The Trenches

It is now time to turn to autobiography—or primary historical data, as I prefer to think of it—because it was in 1983 that I arrived in Washington as President of the Association of American Universities, the university group whose members were most deeply concerned about fair payment for the costs of research. I did not realize, though perhaps I should have, that the issue of indirect costs would occupy so much of my time over the next ten years. If I thought about it at all, I am sure that I thought that the 1982 revisions had laid the issue to rest, if not forever, then at least long enough to see me peacefully through my tenure in office. Certainly, my background did not make me the most obvious person to land in the center of this particular controversy. I had been more than content, during my years at Stanford to leave that exotic topic to those who seemed to derive pleasure from arguing about it with government auditors. Far from being an expert on Circular A-21, I was a genuine innocent.

Innocence does not flourish in the Washington air, however, and I was quickly plunged into the indirect cost wars in the context of the Fiscal 1983 budget, the first of a series of efforts on the part of the government to lower indirect cost rates unilaterally and by an arbitrary amount. The Department of Health and Human Services proposed in that year's budget to limit the reimbursement of indirect costs to 90 per cent of the negotiated rate for research grants. This strike by DHHS was notable in three important respects. First, until this point, changes in indirect cost rules had been negotiated between experts on the two sides, and were confirmed in the form of amendments to Circular A-21. This time, however, the change by-passed the rule-making process entirely. It was embedded in the President's budget, it was but forward by a single department, and its passage through OMB had been via the budget side of the agency, not the management side, where these matters had traditionally been handled.

Second, for the first time, a major change was proposed that had nothing to do with reimbursement principles but was wholly driven by budgetary considerations. The purpose of the initiative was to allow the Reagan Administration to demonstrate that it was committed to enabling NIH to make 5000 awards for new and competing grants without having to ask for a larger appropriation. In doing so, faculty groups would be appeased and the myth of fiscal responsibility would be honored.

The third important respect in which this initiative differed from others was that there was not even a pretense that the proposed 10 per cent reduction in recovery had been negotiated or was in any way consistent with the cost-based system laid out in A-21. In short, indirect cost policy had ceased to be a technical issue, to be worked out by technicians, and had become a political issue, to be fought out in different arenas using different methods.

The principal arena was the Congress, and the methods were those used by higher education on issues of tax policy, appropriations, or any other matter in which the Congress is involved. Using the ready access to Members of Congress that university presidents and other officers enjoy by virtue of their status back home, the case was made against the reduction. As it happens, the Congress tends to be sensitive to charges of arbitrary action by the agencies of the executive branch, and this one struck a resonant chord. But as it also happens, indirect cost recovery is not an issue that Members enjoy dealing with. Unlike tax policy, for example, which is even more mind-numbingly technical, there is no compensating political reward for becoming an expert on indirect cost recovery. In this instance, therefore, the Appropriations Committees rejected the ten percent reduction, but in doing so they noted that indirect cost

rates were rising, and so the Secretary of HHS was instructed to review the matter in consultation with universities and other concerned government agencies and to report on the findings of the review.

DHHS chose to interpret the Congressional instruction as a mandate to restrain the growth of indirect cost rates. Armed with that interpretation, the Department (or OMB—each agency claimed that the proposal originated with the other) proposed to freeze each institution's indirect cost rate at the current year's level. In exchange, it was proposed that mandatory cost sharing be ended. Not only had this arrangement not been negotiated, but it was less generous than it seemed, because virtually all universities were already sharing costs at well above the mandated level, and would need to continue to do so in order for their faculty to remain competitive. Again, the Congress rejected the proposal, and in doing so, it appeared to accept an argument put forward by university representatives that, if there was a problem of rising research costs, it was not a problem limited to indirect costs. Costs are costs, the argument went, and if the Congress were to conclude that too much money was being spent on research, the rational way to deal with that belief was to cut appropriations for research, not one class of expenses. The Congress, in a King Canute-like gesture, this time instructed DHHS to act vigorously to restrain the rise of both direct and indirect costs. It was possible to detect in this instruction a rising level of irritation.

Given the recent record, it was not surprising that in 1986 the government chose to implement half of the congressional mandate—the half having to do with indirect costs. This time, allegedly in order to save \$100 million from the NIH budget, the budget that the President submitted to the Congress proposed to limit recovery for administrative costs to 26 percent (later reduced to 20 percent). In fact, nobody knew what such a change would cost universities or save the government. It was a made-up number, useful largely for the number of zeros in it. It was clear, however, that some institutions would have lost a great deal of money, while others would not, depending largely on how they had chosen to account for various administrative items. If the proposal were to be adopted, though, it would put another nail in the coffin of cost-based reimbursement. That was important to all universities, but especially to those in the private sector whose costs could not be met by state appropriations and whose rates, in part a reflection of that fact, were considerably higher than those in the public sector.

The differential impact of this proposal on private institutions led one day to a revealing and alarming insight into the way the world had changed. A small group from AAU and COGR visited the senior official of OMB responsible for the NIH budget and, hence, for this proposal. We pointed out to him that, if adopted, this cap could seriously hurt some of the nation's leading research universities, a result which, surely, we said, no one wanted. He was, to say the least, unmoved. In his view, the government should buy research as it buys anything else, from the low bidder, so long as the quality is adequate. When star faculty in private universities figured out what was happening, either they would bring pressure on their universities to lower their price or they would move to public institutions where their proposals would be more competitive. In either case, the government's purpose would be served: acceptable quality research would be done at lower cost. Where it was done was a matter of complete indifference. I remember thinking, as we left the office in a state of shock, that we had come a long way from the vision of Vannevar Bush, James B. Conant, and the other architects of post-war American research policy.

The battle went on through the Spring and Summer. In the end the Congress had appropriated \$1 billion more for NIH than the President had asked, ten times the ostensible savings from capping the administrative portion of the rate. As part of the final budget deal, a sub-element of the administration rate was capped, saving the government no money and costing the universities none. But, to whatever extent cost-based reimbursement constituted a principle worth fighting for, the principle had been formally breached, and the breach would be widened in the years to come. When it was all over, I tried to explain to AAU's member presidents what I thought had happened.

"...this attempt to reduce indirect cost recovery was, like its predecessors, motivated primarily by budgetary considerations, not by any particular zeal to reform the research support system. The alleged abuses in the latter were merely useful arguments in support of the former. There are, of course, those who would like to reform the system. For them, the budget pressures provided important support, just as their arguments buttressed the position of those whose goal was to make the budget look better.

"If the case had been solely budgetary, I believe that it would have been relatively easy to defeat it outright...

"However, it was not to be that easy. Doubts about the legitimacy of the administrative elements of the indirect cost rates increasingly were shared by key Members of Congress, and their patience for doing battle yet again in a seemingly endless campaign was growing shorter. As in the past, they were willing to help, but this time the help was accompanied by a clear message: 'Settle it, and try not to come back again.' The instrument for conveying the message was the Yates Amendment to the Urgent Supplemental Appropriations Act, which prohibited OMB from spending any money to implement changes in A-21. OMB took the message to mean that they were expected to reach a reasonable result after consultation with the universities, and we took the message to mean that we could not expect the Congress to continue this extraordinary provision much longer or repeat it very often."

Of all the battles in the indirect cost war, this one was the most revealing. It was the first clear example of what should already have been clear, and of what the future held: Indirect cost policy was no longer to be thrashed out between government and university accountants. Instead, the political people had taken over on both sides, and while the early rounds of that battle might be called a draw, something had to be done to change the terms of the debate or bad results lay ahead.

The response of the AAU universities, working with COGR, was the creation of the Pings Committee, so named for its chair, Cornelius Pings, then Provost of the University of Southern California and later my successor as President of the AAU. The committee was charged with considering all sensible ideas for reform of the system and to recommend changes that would make reimbursement policies clearer, simpler, easier to explain, more stable, and therefore easier to defend.

The Pings Committee held sessions around the country in which it met with government officials, university officers, and representatives of faculty groups. It commissioned studies of institutional indirect cost rates in an effort to understand better why rates varied among institutions that seemed on the surface similar. In the course of its deliberations, it produced a great deal of interesting and useful information and not least of all a set of recommendations that became the basis for the universities' negotiating stance in the years ahead.

The committee conceded that charges for administration were hard to explain, unpopular

and an easy target for ridicule. Since those costs were, in any case, not rising, according to data generated by the committee, it made sense to offer universities an incentive to accept a fixed allowance in lieu of the need to document and negotiate a new rate each time. In exchange for that concession, the committee proposed that facilities and instrumentation costs—interest, depreciation and maintenance—be allowed to rise as those costs actually increased. Adoption of this scheme would neutralize the most controversial parts of the rate and focus on the main issue of public policy involved in the entire indirect cost debate, namely, the need of research universities to keep their facilities and instrumentation up to date.

The Pings proposals produced a spirited debate within AAU. A significant minority of members feared that the report offered the government a menu of acceptable cuts, from which it would gladly choose the choicest ones, without any assurance that the second part of the deal would actually come to pass. Such fears were not groundless, but they were more than matched by a broadly held view that the failure to offer some reasonable plan would be likely to produce even worse results. With some misgivings, therefore, the report was adopted.

The Pings report turned out to be a useful document. It provided the basis for substantive discussions with the government about changes in the system that might be advantageous to both sides. Discussions of this kind always go slowly. While OMB is formally responsible for the rules governing indirect cost payments, it is the research supporting agencies whose budgets and priorities are actually at stake. Getting them to the same table is no easy feat, and once there, their interest in pursuing change is highly variable. The three hundred-pound canary at the table is the Department of Health and Human Services which is the largest supporter of university research and which is responsible for rate-setting and auditing at the vast majority of universities.

The truth is that DHHS has never been committed to genuine cost-based reimbursement. Its historic policy has been to keep rates as low as possible. It shares that view with the National Science Foundation; both agencies preferred to use their appropriations to make more grants at a lower average cost, and the obvious place to lower the average was on the indirect cost side of the ledger. In keeping with that tradition, DHHS representatives had no particular interest in proposals that would allow any major part of the rate to rise with real costs—as the Pings Committee proposals would have done for facilities costs. Thus, the discussions were hardly models of crisp deliberation. Still, progress of sorts was being made, and at the very least, the fact that serious deliberations were taking place seemed to calm the indirect cost waters somewhat.

All of that came to an abrupt end when John Dingell, Chairman of the House Committee on Energy and Commerce, perhaps the most powerful and feared member of Congress, and self-described nemesis of fraud and corruption in government contracting set his sights on Stanford University. Rep. Dingell did not earn his reputation through the use of judicious understatement. The blunderbuss, not he rapier, was his weapon of choice. Here is how he described Stanford's alleged misdeeds in a column for the Palo Alto Times Tribune on March 31, 1991:

“What we have learned about Stanford makes former Defense Secretary Weinberger look frugal with his \$600 toilet seat. Stanford purchased an early 19th century Italian fruitwood commode at \$1200—subsidized by taxpayers. The taxpayers also contributed to...\$7000 for linens, the purchase of two Voltaire chairs from Pierre Deux at \$1500 apiece, and a pair of George II urns for a ‘special price’ of \$12,084, and \$400 for flowers for the dedication of the Stanford horse stables. While all of this was happening, the Board of Trustees saw fit to visit Lake Tahoe on a retreat cost-

ing \$45,250—also subsidized by the taxpayers. In addition, the taxpayers are being asked to pick up a significant portion of the administrative expenses of Stanford's elite shopping center.”

With such juicy stuff to chew on, no reporter was inclined to look into the arcana of cost pools, memoranda of understanding, or any other aspect of the system that failed to titillate. Nor did Mr. Dingell and his staff have any interest in helping the press and the public to understand what was at issue. Instead, all discussion of reform stopped, while universities, including Stanford, frantically rushed to a retrospective examination of their cost pools for possibly offending charges and to pay the government for any that they found. The government, for its part, proposed in record time, a revision to Circular A-21 that prohibited reimbursement for charges that failed to pass the smell test—thereby implicitly admitting that those charges had been legitimate before the new rules were adopted.

As is often the case with high profile Congressional investigations, this one turned out to have far less to it than met the eye. In the end, Stanford was essentially cleared of wrong-doing and settled with the government for a little more than \$1,000,000 for ten years of audits—a number well within the normal rounding error. But in these matters vindication comes late and in private, while the damage is done early and in public. Stanford suffered some short-term damage to its reputation and some longer-term financial consequences. Research universities, as a class, suffered from a loss of public esteem and a souring of the political climate. And public policy suffered because for nearly a year it was impossible for any government agency to risk talking about reform with universities while they were the object of ridicule and scorn by so powerful a person as John Dingell.

By 1992, calmer heads came into positions of responsibility at OMB and the Office of Science and Technology Policy. Wise and experienced leadership in those two agencies helped to organize a series of informal meetings on Saturday mornings in which the parties explored ways to work out of the impasse that had developed. That process was helped along by a parallel set of discussions co-chaired by William Richardson, President of The Johns Hopkins University and Harold Varmus, a Nobel Laureate, a Professor at UC San Francisco, and not long thereafter, Director of The National Institutes of Health. These conversations included university administrators, association heads, faculty, and representatives of the major scientific societies. Their purpose was to identify areas of agreement and to use those as a means of bridging the areas of disagreement. The process, as much as the substance of the group's work, helped make it possible for all parties to take part in the larger negotiations then in progress and gave the results of those negotiations a degree of political legitimacy previously unattainable.

Eventually, a new set of proposals was developed that would limit recovery of administrative costs but continue to reimburse facilities costs, very much in the spirit of the Pings Committee report. Language incorporating those changes was drafted and largely agreed to. It seemed that closure was near.

But 1992 was not an ordinary year; it was a presidential election year. During the campaign, candidate Bill Clinton stopped at a Maryland college campus, and in his speech to students and faculty, he promised to bring an end to the waste, fraud, and abuse of the indirect cost system. He would, he said, take research funds from the wasteful university administrations and return them to the scientists in their laboratories. No doubt to the surprise of the candidate and his staff who could surely not have known much about the history of the issue or the passions it excited, a tidal wave of letters, faxes and phone calls hit the campaign from every

“friend of Bill’s” who could be identified by university representatives. The Clinton campaign, while not publicly changing its position, gave informal assurances that the candidate had not meant exactly what he said. It turned out, however, that, upon taking office, the new leadership of OMB refused to issue the revised rules that the old crowd had agreed to, and a new round of studies and negotiations was begun.

What Have We Learned?

That is far from the whole story, though. The place to start is with a dose of reality—or several. For universities, that means that it is past time to give up the fantasy that government is a partner in the research enterprise. The government is many different things in this relationship—patron, priority-setter, scold, regulator—but it is not and cannot, by its nature, be a partner, if that word means what it is commonly understood to mean in ordinary discourse. It is not that the government acts in bad faith, it is that it acts out of its own nature: a democratically-controlled apparatus, subject to multiple pressing demands, in which policy is set by a changing cast of characters who come to power with different ideas of what is important and how to accomplish it, urged on them by shifting electoral constituencies. For all its ups and downs and fits and starts, there has been a remarkable constancy in the government’s commitment to university-based research, but no commitment is good beyond the next appropriations cycle, and in emergency circumstances, not even that far.

The most debilitating manifestation of the partnership myth as it affects indirect cost policy is the persistent notion that universities were promised full cost reimbursement for research, and that any departure from that commitment is a breach of faith. I can say, categorically, that in my ten years dealing with this issue in Washington I never met a single federal official who believed that any such promise had ever been made or who had any intention of reimbursing full indirect costs, even if it were possible to calculate that elusive sum.

Universities can save themselves future trouble if they view their relationship with the government as another example of the most common kind of Washington relationship, a combination of business and politics. The goal should be to strike the best deal possible, to keep a sharp eye out for changes in the environment that might produce a shift in policy, and to be prepared to act to help shape the new policy.

Faculty, too, have a date with reality. Even in this (perhaps brief) period in which politicians have chosen research as the road to sustained economic growth, it cannot have escaped their notice that there is broad public and political concern about the quality and availability of undergraduate education and that institutional subsidies for research are blamed by many for rising tuitions. While faculty enjoy short term advantages from lower indirect cost rates, in the longer term the insistence on low rates combined with the demand for compensating institutional subsidies may well increase the force of a backlash that is already larger than the size of a man’s hand on the horizon.

There is a general lesson which both university administrations and faculty would do well to learn: The great thing about disputes over money is that they provide a handy matrix for compromise. However, when disputes over money are turned into arguments about principle, only war can settle the matter. The battles over indirect cost are quintessentially fights about dollars in which invented principles have been used to bludgeon the adversary. The sensible approach is to negotiate as hard as possible on every occasion, and then return to fight another day. It is an approach that applies equally to institutional negotiations over rates and to higher level negotiations over policy.

Finally, and most important of all, it should be clear that in facing the government universities and their faculties have far more important interests in common than there are differences between them. Differences there are, to be sure, but they are not necessarily unhealthy unless, as was too often the case in the past, they are allowed to grow larger for want of a structure in which they can be negotiated and resolved. Much more effort needs to be devoted to building and maintaining a coalition that will enable universities and their faculties to deal with the government on all of the issues of research costs, direct and indirect, as if they were actually participants in a common enterprise and not warring parties that happen to inhabit the same piece of land. That won't "solve" the indirect cost problem, but it is the course most likely to produce policies that will enhance the great enterprises of teaching and research in the interest of the American people.

About the Author

In 1993 **Robert Rosenzweig** became President Emeritus of the Association of American Universities. He lives in Palo Alto, CA where he has been writing and consulting with a number of universities on issues of policy and organization.

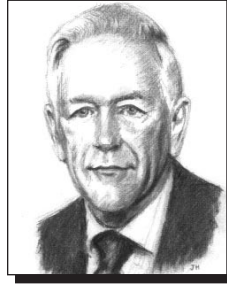
From 1983-93 he served as President of the Association of American Universities, a Washington-based organization representing the interests of the nation's leading research universities. For twenty years prior to that he held a variety of academic and other administrative positions at Stanford University, the last of which was Vice President for Public Affairs.

Rosenzweig took a BA and MA in Political Science from the University of Michigan and a PH.D. in the same field at Yale. He taught at Amherst College, and before joining Stanford in 1962 spent five years in Washington, first as a Congressional Fellow of the American Political Science Association and then in the U.S. Office of Education, the last two years of which were as Special Assistant to the Commissioner.

He has written three books and many articles on various topics in higher education

The books are: "The Federal Interest in Higher Education" (with Homer D. Babbidge, Jr.) 1962 (McGraw Hill); "Research Universities and Their Patrons" (1982); and "The Political University: Policy, Politics and Presidential Leadership in the American Research University", The Johns Hopkins University Press (1998).

UNIVERSITY TECHNOLOGY TRANSFER: EVOLUTION AND REVOLUTION



HOWARD W. BREMER

*“Upon this gifted age, In its dark hour
Rains from the sky a meteoric shower
Of Facts-; They lie unquestioned, uncombined—
Wisdom enough to leech us of our ill
Is daily spun, but there exists no loom
To weave it into fabric.*

•

*from a poem by
Edna St. Vincent Millay*

Prologue

Propos to the basic research function at universities, it is suggested that the loom for weaving into a substantive fabric the wisdom derived from the conduct of research lies in the enlightened cooperation between the universities, industry and the government which, through voluntary acts and legislative initiatives, has permitted and continues to permit the transfer of that wisdom to the public for its use and benefit.

Technology Transfer Defined

The concept of technology transfer—the transfer of the results of research from universities to the commercial sector—is said to have had its origins in a report made, to the President in 1945 by Vannevar Bush¹ entitled “Science—The Endless Frontier.” Having witnessed the importance of university research to the national defense for its role in the successful Manhattan Project, he projected that experience to a recognition of the value of university research as a vehicle for enhancing the economy by increasing the pool of knowledge for use by industry through the support of basic science by the feder-

al government. The report stimulated substantial and increasing funding of research by the federal government leading to the establishment of several research-oriented governmental agencies, e.g. the National Institutes of Health, the National Science Foundation, the office of Naval Research, and, ultimately, to the acceptance of the funding of basic research as a vital activity of the federal government.

Long before the Vannevar Bush concept, but absent federal support in their research endeavors, the universities have been engaged in the transfer of the technology, although that specific term may not have been applied to their activities.

Their greatest technology transfer efforts have probably been expended in preparing papers on research results for publication in scientific journals. Another area involves the activities of the Extension Services, particularly the Agricultural Extension Services, which communicates a great variety of useful information, largely technical, but also in social and economic fields, to many users, both rural and urban.

Another area of communication of information lies in the continuing education programs, e.g. in law, medicine, pharmacy, and engineering, to keep professionals in those fields abreast of the latest developments.

Technical consultantships provide technology transfer in both directions—the consultant imparts information to whomever is engaging him while the consultant, in turn, can expect some professional enrichment from that activity.

Still another means for transferring technology is by making a tangible product of research available to others with or without a view toward commercialization. For example, seedling plants for propagation by others, appropriate fragments of tissue for tissue culture, cell lines, hybridomas, and seeds as well as mechanical or electronic prototypes and computer programs.

Thus, technology transfer occurs in many ways—through the simple spoken word, through the physical transfer of a tangible product of research or through the relative complexity of an intellectual property licensing program.

Although all of these forms of technology transfer have been and are being practiced today the focus of this paper is upon the transfer of technology as represented by the transfer of a property right as the result of ownership of the intellectual property generated during the conduct of research. Such ownership may be manifested by patents, copyrights, trademarks, trade secrets or a proprietary right in the tangible products of research.

Intellectual Property

CONSTITUTIONAL BASIS

As we all know, the Constitution was drafted in the context of a struggle with a government which had abused its obligations to defend the rights of its citizens. It was no accident, therefore, that the salient portion of the Constitution drafted for the purpose of protecting your liberties, the fifth amendment, made the Government the servant and protector and not the master of your individual rights. The Fifth Amendment of the Bill of Rights provides that:

“No person shall—be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use without just compensation.”

Thus, the Fifth Amendment provides generic protection for individual property. Since there is little doubt that the term “property” as used in the fifth amendment includes intellectual property, it

would seem that the protection afforded the individual by that amendment would be adequate. Yet, the framers of the Constitution felt compelled to be even more explicit about intellectual property and provided the following language in Article 1, Section 8:

“The Congress shall have Power—To promote the Progress of Science and useful arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”

Why this special handling of intellectual property?

There was no recorded debate in the Constitutional Convention on September 5, 1787, when Article I, Section 8, was presented and it was approved unanimously. That intellectual property, the products of the mind, should prospectively receive legal protection, even from a centralized Government to be formed, was a principle upon which no one disagreed.

The power given under this clause is not general. Hence, it expressly appears that Congress is not empowered by the Constitution to pass laws for the benefit of protection of authors and inventors except as a means to “promote the Progress of Science and useful arts.”

Under this specific power the present patent statute, Title 35 of the United States Code, (35 U.S.C.) was enacted. It is significant that the face of the patent document contains the following statement:

“—these Letters Patent are to grant unto the said claimant(s)—the right to exclude others from making, using, or selling the said invention throughout the United States.”

and that 35 U.S.C. 261 characterizes this right to exclude as a property right. The technology transfer function is in great part based upon the recognition of and the specific provision for that very special property right.

NATURE OF UNIVERSITY RESEARCH

During the prevalence of the “ivory tower” concept of universities and the research that was carried out in them, little thought or impetus was given to the transfer of the results of that research to the public other than through the accepted and acceptable route of scientific publication. In fact, under that “ivory tower” concept, a researcher who accepted a corporate subsidy aroused the suspicion among his colleagues that he had been diverted from his basic research and had become a tool of vested interests. He had accepted “tainted money.”

When, in 1924, it was suggested at the University of Wisconsin that a plan be developed to make use of patentable inventions generated by faculty members which would:

- protect the individual taking out the patent;
- insure proper use of the patent; and, at the same time;
- bring financial help to the University to further its research effort,

the purists quickly applied the “tainted money” theory to the plan. It was feared that any such arrangement would divert the scientist from basic research to work only on those ideas which appeared to have commercial potential. In other words, the research function would no longer be driven by the seeking of new knowledge but by the dollar-driven need to solve current problems in the real world, even to the development of products and processes to market-ready condition.

The fears propounded by the purists then, and which are still embraced in academia by some, did not materialize. There was no great rush toward patenting. There was no evident movement among

university researchers toward applied research tied directly to actual product development. Nor was there any observable change in the research scientists' attitude. In fact, University research then, even as now, remained essentially basic in character.

The generation of inventions is almost never the main objective of basic research. If inventions do flow from that research activity, it is a largely fortuitous happening that takes place because the researcher, or perhaps, an associate, has the ability to see some special relationship between his scholarly work product and the public need. It is from the recognition of this connection, which can convert a discovery or invention into patentable invention, that innovation arises.

It was not too many years ago that there was little appreciation of the value of intellectual property generated during the course of research being conducted on the university campus or of the value of that intellectual property to the university if properly transferred to the private sector for development and marketing through appropriate arrangements. In fact, on numbers of campuses those activities would have even been unwelcome as an incursion into academic pursuits as was the early experience at Wisconsin. Nevertheless, prior to the legislative initiatives under which, today, most universities engage in the protection and licensing of intellectual property, several universities and organizations carried out such practices with the attendant opportunity to generate funds to aid in supporting research efforts. Prominent among such institutions were the University of California, Iowa State University, Battelle Development Corporation, Research Corporation, which represented an number of universities and the University of Wisconsin through its patent management organization the Wisconsin Alumni Research Foundation.

THE GOVERNMENT VECTOR

During the early history of the United States very little technical development work was done by the Government and therefore, as a practical matter, the question of the Government owning a patent never arose. Gradually, federal agencies began to undertake the practical kind of development work, which led to inventions. Since prior to World War II almost all Government-financed research and development work was conducted in federal laboratories by full-time Government employees, there was a small but recurring problem of what to do with inventions resulting from such work—inventions which, if made by private parties, would have become the subject of patent applications.

This situation changed rapidly during and after World War II when the technological demands imposed by more and more sophisticated military requirements, as well as the increasing complexity of support services, made it quickly evident that there were not sufficient resources within the Government to undertake all the scientific projects necessary to a winning war effort. The absolute necessity to utilize the best technical ability available, regardless of its locus, spawned a rapid proliferation of Government-sponsored and-funded research and development contracts.

The proper disposition of rights to patents resulting from this work was theoretically as important then as now but was never seriously addressed as a major problem because of the exigencies of wartime needs.

The basic issue was whether the Government should always take the commercial rights to patentable inventions generated under a Government sponsored contract or from Government-funded research or whether such rights would be better left with the contractor or grant recipient to permit utilizing the patent system for transferring the technology developed to the public sector for its use

and benefit.

Post World War II the rapid technological strides made under the impetus of a wartime footing and the obvious necessity for continuing technological superiority, at least in defense-oriented efforts, made it imperative to continue to provide public support for science. Nor was this support limited to the military. For example, in 1950 Congress finally provided an annual budget of \$15 million for the National Science Foundation to conduct basic scientific research at universities.

During this same period, hundreds of millions of dollars were appropriated by the Government in the area of medical research in the beginnings of an all-out attack on disease.

With the rapid expansion of scientific projects being undertaken and supported by the Government, the same shortage of technical ability and facilities continued to prevail as had been experienced under the pressures of World War II. Since the Government could not do all the necessary work in its own facilities, qualified private companies, universities and nonprofit organizations were sought out to perform many of the programs through contractual arrangements. In each arrangement, the same old problem of ownership of patent rights existed but was seldom, if ever, directly addressed. In the case of universities and other non-profit organizations, few were engaged at the time in patenting the results of research and in technology transfer activities. Since one of the prime objectives of such an institution was to support its respective research efforts and since the government was a ready source of funds for supporting such efforts, the prevailing attitude was simply to “take the money and run” with little thought being given to the underlying property rights and the value of those rights in the long term.

The Government itself had not developed a uniform patent policy for all of its agencies regarding the disposition of rights in intellectual property generated during the course of research supported by those agencies. In fact, there was no existing statutory authority which gave the agencies the right to hold patents or license technology. Such acts were viewed as objectives of the agency mission. Consequently, each governmental agency which supported a research and/or development effort, through either or both of contractual or grant arrangements, developed its own policy. The ultimate result was that many and varied policies evolved to the point that the university sector was faced with the prospect of having to deal with some 26 different agency policies. Also, since to support a given research pursuit, funds from different agencies were often co-mingled, more than a single agency policy had to be considered with the most restrictive policy becoming the controlling policy.

Operating under the various agency policies, the Government had accumulated in its patent portfolio about 30,000 patents of which only about 5% had been licensed and the inventions of which had found their way into commercial use in an even smaller percentage. Thus, with the Government, as represented by its agencies, espousing, in the main, a non-exclusive licensing policy the experience of licensing Government-owned patent had been irrefutably one of non-use. For example, in 1978 NASA reported that through 1978 it had had 31,357 contractor inventions reported to it. Of those, title had been waived to the contractor in 1,254 cases, or less than 4%. The results of NASA's own licensing program were said to have been disappointment representing a commercialization rate of less than 1%. In contrast, the rate of commercialization of the waived inventions was consistently in the 18-20% range. Therefore, the intended benefits that were to flow to the public in the form of new products and processes as a result of federal support of research both intramurally and in the university sector and stimulated through use of the patent system were left unrealized.

An interesting comparison along these lines was made by Harbridge House² in its 1968 study of Government funded patents put into use in 1957 and 1962. It was found that contractor-held inventions were 10.7 times as likely as Government-held inventions to be utilized in products or processes employed in the private sector for the benefit of the public.

Moreover, under the agency policies then in place, Government ownership of a patent was in a sense an anomaly. The patent system was created as an incentive to invent, develop, and exploit new technology to promote science and useful arts for the benefit of the public. When the government held title to those many inventions under the aegis that the inventions should be freely available to all, much the same as if the invention had been disclosed in a publication, the patent system could not operate in the manner in which it was intended. The incentive inherent in the right to exclude conferred upon the private owner of the patent, and which is the inducement to development efforts necessary to the marketing of new products or the use of new processes, was simply not available. What is available to everyone is of interest to no one.

The ineffectiveness and inadvisability of such agency policies and their adverse effect on the public benefit should have been apparent.³

GOVERNMENT POLICY—MOVE TOWARDS UNIFORMITY

In 1963, Jerome Weisner, President Kennedy's Science Advisor, recognized a need for some guidelines to effect a more uniform Government policy toward inventions and patents on a Government-wide basis. The results of Dr. Weisner's study culminated in the Policy Statement issued on October 10, 1963 by President Kennedy⁴ to establish Government-wide objectives and criteria, subject to existing statutory requirements, for the allocation of rights to inventions as between the Government and its contractors, which would best serve the overall public interest while encouraging development and utilization of the inventions.

Since the policy, as promulgated, would most likely have to be revised after experience had been gained in operating under it, a Patent Advisory Panel was established under the Federal Council for Science and Technology to assist the Agencies in implementing the Policy, acquiring data on the Agencies' operations under the policy, and making recommendations regarding the utilization of Government-owned patents. In December 1965, the Federal Council established the Committee on Government Patent Policy to assess how the Policy was working.

The studies and experience of the Committee and the Panel culminated in the issuance of a revised Statement of Government Patent Policy by President Nixon on August 23, 1971.⁵ The changes effected in the Nixon Policy Statement were made as a result of analysis of the effects of the Policy on the public interest over the seven years from the Kennedy Policy Statement. The fundamental thrust of that statement was:

A single presumption of ownership of patent rights to government-sponsored inventions either in the government or its contractors is not a satisfactory basis for government patent policy and, that a flexible, government-wide policy best serves the public interest.

The considerations basic to the Statement of Government Patent Policy were the following:

- The Government expends large sums for the conduct of research and development which results in a considerable number of inventions and discoveries.
- The inventions in scientific and technological fields resulting from work performed under

Government contracts constitute a valuable national resource.

- The use and practice of these inventions and discoveries should stimulate inventors, meet the needs of the government, recognize the equities of the contractor, and serve the public interest.
- The public interest in a dynamic and efficient economy requires that efforts be made to encourage the expeditious development and civilian use of these inventions. Both the need for incentives to draw forth private initiatives to this end, and the need to promote healthy competition in industry must be weighed in the disposition of patent rights under government contracts. Where the contractor acquires exclusive rights, he remains subject to the provisions of the antitrust laws.
- The public interest is also served by sharing of benefits of Government-financed research and development with foreign countries to a degree consistent with our international programs and with the objectives of U.S. foreign policy.
- There is growing importance attaching to the acquisition of foreign patent rights in furtherance of the interest of U.S. industry and the Government.
- The prudent administration of Government research and development calls for a Government-wide policy on the disposition of inventions made under Government contracts reflecting common principles and objectives, to the extent consistent with the missions of the respective agencies. The policy must recognize the need for flexibility to accommodate special situations.

Although there is evidence that the guidelines did bring the patent practices of the Agencies into greater harmony, divergent policies still existed and there was a strong presumption, if not evidence, in terms of the transfer of technology to the public sector, that the more restrictive the policy of the Agency, i.e. the more “title” oriented the Agency was toward inventions and patents generated under its funding i.e. the Agency generally took title to most if not all inventions made with the use of the funds, the less was the likelihood that the technology would be transferred for the public benefit.

INSTITUTIONAL PATENT AGREEMENTS

During the period from 1963 to 1971, while experience with the Weisner-Kennedy effort was being gained, further efforts were being made to persuade several federal agencies, specifically the Department of Health, Education and Welfare (now Health and Human Services [HSS]) and the National Science Foundation, to enter into Institutional Patent Agreements, (IPAs) with universities. The policies of both of these agencies permitted a waiver of rights to the inventions made with their funds (referred to as an 8.2(b) grant of greater rights). However, on the very few occasions where such a waiver was granted, it was so fraught with restrictive provisions that it presented an unworkable basis for transferring technology to the private sector. No commercial firm was willing, under the conditions imposed under many of the waivers, to risk the expenditure of the necessary development funds.

Subsequently, after five years of negotiation, the then Department of Health, Education and Welfare, in 1968, issued its first new IPA to the University of Wisconsin. This was followed in 1973, after another five years of effort, by an Institutional Patent Agreement⁸ between the national Science Foundation and the University of Wisconsin. The first ever of such agreements with that agency.

That evidence of not only the availability of an IPA, but that those two agencies would actually grant them, appeared to provide some impetus to universities to engage in the technology transfer business. Nevertheless, some of the provisions of the IPAs available from those two agencies were unacceptable under some universities’ policies, while many other governmental agencies still clung tena-

ciously to the policy of taking title to all inventions made with funds they had supplied.

Fundamental to the success of technology transfer under the IPAs was the vestment of certainty of title to inventions held by the universities under those agreements. That factor and, in addition, the ability of universities to grant exclusive licenses were instrumental in the subsequent willingness of private sector industry to engage in licensing arrangements with universities that had IPAs.

Although limited to two agencies, the IPAs were not only important as manifesting a change in the attitude of those agencies and potential licensees but, more importantly, as establishing, through negotiation, terms and provisions which were carried into and set the tone for the legislative effort which culminated in the passage of Public Law 96-517, the Patent and Trademark Law Amendments Act, in 1980 (the Bayh-Dole Act). In fact, that law is often looked upon as a codification of the terms and provisions of the IPAs.

THE BAYH-DOLE ACT⁷

The passage of the Bayh-Dole Act was the reward for almost 20 years of effort by the non-profit sector to stimulate the transfer of technology through the vehicle of the patent system. It was the culmination of the many pieces of legislation introduced over many years that had sought to establish a uniform patent policy within the government. It should be considered a landmark piece of legislation in that, after many false starts and unsuccessful efforts it was, finally, a recognition by Congress:

- that imagination and creativity are truly a national resource;
- that the patent system is the vehicle which permits us to deliver that resource to the public;
- that placing the stewardship of the results of basic research in the hands of universities and small business is in the public interest; and, significantly,
- that the existing federal patent policy was placing the nation on peril during a time when intellectual property rights and innovation were becoming the preferred currency in foreign affairs.

The most significant feature of the Act was that it changed the presumption of title to any invention made by small business, universities and other non-profit entities through the use, in whole or in part, of government funds from the government to the contractor-grantee. Another factor, often overlooked, is that the Act did away with the distinction between grants and contracts, which agencies had often made when dealing with universities, a distinction which a number of agencies rigorously applied in their zeal to retain rights to intellectual property as a contractual obligation.

It is also not universally recognized that the Act provided, for the very first time, statutory authority for the Government to apply for, obtain and maintain patents on inventions in both the United States and foreign countries and to license those inventions on a non-exclusive, partially exclusive or exclusive basis. The passage of the law was not, however, the end of the battle. It took over a year to settle the controversy which arose over the drafting of the regulations under the law. During the course of the legislative effort, an almost adversarial relationship had developed as between the University sector on the one hand and the Departments of Energy, Defense, and NASA on the other hand. The nature of that relationship became very clear when those agencies combined to voluntarily draft regulations which actually controverted the law and its intention. As a consequence, much greater attention was given to the regulations by the Council on Governmental Relations which promoted and influenced subsequent regulations that afforded protection against both arbitrary exemptions to the law at agency discretion and to the exercise of march-in rights by the Government.

The Bayh-Dole Act represented the first cautious step into a new relationship between the Government, as represented by its agencies, and the universities. It also presaged a new and closer relationship with industry. The certainty of title in the universities to inventions made with government funds afforded by the Bayh-Dole Act, which was the stimulus to successful technology transfer under the Institutional Patent Agreements, provided the major impetus to new and expanding university-industry relationships. Inasmuch as the Government always receives an irrevocable royalty-free license under any of such inventions and because of other provisions of the Bayh-Dole Act and the ensuing regulations under that Act, the relationship is, in reality, a university-industry-government relationship.

The Economic Climate

To more fully appreciate what has evolved through the sequence of events which has been enumerated, it must be kept in mind that through this period, the economy of the country as a whole, as well as the economy of each state, was and still is in transition. Today, universities operate in an economic climate which:

- is knowledge based—not capital based (although, without question, availability of capital is a necessity);
- is entrepreneurially based—witness the large numbers of new companies created in recent years;
- involves world markets—the international aspect of protection for intellectual property generated through the research function must be a consideration;
- reflects continuous and often radical technology changes;
- is becoming more decentralized—making state and local options and initiatives more significant;
- is an economy of appropriateness not one of scale—i.e., merely increasing the size of a production plant will not necessarily reduce the cost of product or increase its quality;
- is increasingly competitive on a global scale—witness the advent of the European economic community and other geographic economic blocks.

In view of this continually evolving economic climate, and since new products arise from new fundamental ideas as well as from new applications of existing technology, the necessity for supporting research is evident. However, support of research is not enough. That support must be coupled with a creative technology transfer capability. Invention without innovation has little economic value.

With the passage of the Bayh-Dole Act and, in the same year, the decision of the Supreme Court in the Chakrabarty Case,⁸ which stood for the proposition that merely because something was alive (in that case a bacterium) it was not precluded from being patentable, along with the evolution of genetic engineering concepts, the universities were literally propelled into an awareness of the potential economic value of the technology that was being generated in their research programs. That fact made it self-evident that steps had to be taken to make innovation follow invention since invention alone holds little hope for generating needed revenues to support an expanding research effort. Because the government has been and still is the primary source of the funds supporting the research effort at universities, the passage of the Bayh-Dole Act permitted the universities to position themselves, through the establishment or expansion of technology transfer capabilities, to better insure that innovation *would* follow invention.

Government Patent Policy Reshaped

At the outset it must be presumed that Government research dollars are made available in the expectation of not only developing basic knowledge, but also in the expectation that the funded research will lead to products, processes and techniques which will be useful and acceptable in all or part of our society to improve the well-being of society in general.

In the face of this presumption it is apparent that inventions, whether made through the expenditure of private or governmental funds, are of little value to society unless and until they are utilized by society. In order to achieve such utilization it is essential that the invention be placed in a form or condition which will be acceptable and beneficial to the public. In other words, the technology must somehow be transferred to the public sector. To quote Thomas Edison: “The value of an idea lies in the using of it.”

In a free enterprise system such transfer is normally accomplished as the result of pertinent and appropriate activities of private enterprise. Since such activities obviously entail the commitment and expenditure of substantial monies—many times the amount needed to make the invention—adequate and appropriate incentives to such commitment and expenditures must be afforded. Consequently, and since the patent system provides such incentives and is the most viable vehicle for accomplishing the transfer of technology, full and careful consideration must be given to the making of any policy which will affect the transfer of technology that has been generated in whole or in part by Government-funded research. In addition, careful consideration must also be given to proposed changes in the patent laws, including proposed treaty accommodations, which could adversely affect the technology transfer capabilities.

One would not disagree that the primary objectives of a Government patent policy should be to:

- promote further development and utilization of inventions made in whole or in part with government funds;
- ensure that the Government’s interest in practicing inventions resulting from its support is protected;
- ensure that the intellectual property rights in Government sponsored inventions are not used for unfair, anti-competitive or suppressive purposes;
- minimize the cost of administering patent policies through uniform principles; and
- attract the best qualified contractors.

However, of all of the considerations attendant upon the establishment of a governmental patent policy only one consideration should be paramount:

In whose hands will the vestiture of primary rights to inventions serve to transfer the inventive technology most quickly to the public for its use and benefit?

The passage of the Bayh-Dole Act was the beginning of the reshaping of federal patent policy. Subsequent events between 1981 and 1985 further shaped that policy. The Bayh-Dole Act, the first event, became effective on July 1, 1981. The Congressional intent in its passage is abundantly clear from the recitation of the Policy and Objectives portion of the Act 35 U.S.C. 200.⁹

The second event was the issuance in 1982 by the Office of Management and Budget policy guidance to federal agencies for implementing the Bayh-Dole Act in the form of OMB Circular A-124.¹⁰ This Circular clarified provisions in the Bayh-Dole Act regarding:

- standard patent rights clauses for use in federal funding agreements;
- reporting requirements for universities electing title; and
- special federal rights in inventions.

A third event was the issuance of a Presidential Memorandum on Government Policy¹¹ under which federal agencies were directed to extend the terms and provisions of the Bayh-Dole Act to *all* government contractors with a follow on amendment to the Federal Acquisition Regulations (FAR) to assure that all federal R&D agencies would implement the Bayh-Dole Act and the Presidential Memorandum.

The fourth event was the amendment of the Bayh-Dole Act by Public Law 98-620¹² to remove some politically-motivated restrictions on exclusive licensing placed in the original Bayh-Dole Act. That law, in essence, made the Department of Commerce the lead Agency in administration of the Bayh-Dole Act as amended.

The fifth event, which did not occur until 1987, comprised publication of rulemaking¹³ by the Department of Commerce which finalized the provisions of the Bayh-Dole Act, P.L. 98-620, the OMB Circular A-124 and the Presidential Memorandum.

Also, in this same period the establishment of the Court of Appeals for the Federal Circuit, under the able leadership of Chief Judge Howard Markey, gave further impetus to the value of patents and a uniformity to their interpretation which put to rest the disparities which existed among the Judicial Circuits and had led to forum shopping in patent litigation. To paraphrase Chief Judge Markey—no institution has done so much for so many with so little understanding as the United States Patent System.

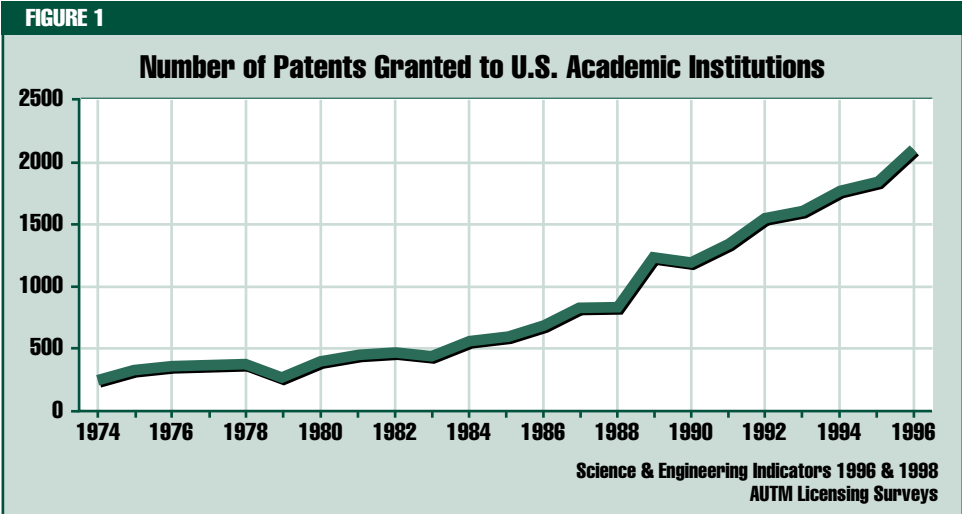
The government patent policy, as reshaped by the events noted, presented a charge and a challenge—a charge to show, through performance, that the confidence which was placed in the hands of the universities by Congress to transfer technology for the public benefit was not misplaced—a challenge to maximize the benefits which can be derived from the opportunity offered through that patent policy to aid in maintaining the United States as the world leader in innovation.

These events, led by the passage of the Bayh-Dole Act created the revolution in university technology transfer.

The Impact of the Bayh-Dole Act

How can we measure the practical impact on universities of the Bayh-Dole Act and the reshaped Government patent policy? Since we are dealing for the most part with the transfer of technology from a protected base, i.e., patents and other forms of intellectual property protection, an obvious answer is to look at the change in the number of patents issued to universities and other non-profit entities, e.g. teaching hospitals, since the effective date of the Bayh-Dole Act in 1981. The increase in numbers of patents issued can be readily seen from Figure 1. The growth and trend lines are evident. The Figure is also significant in that it evidences that in the period from 1981-1985 the university sector was gearing up to either engage in or expand technology transfer efforts and that the fruits of those efforts became abundantly clear in the large increase in patents in the post-1986 period. That trend continues today. Universities now receive approximately 3% of all U.S. origin patents issued. That figure was up from about 1% in 1980.

It is tempting to view patents issued on a year-to-year basis as evidence of current activity, particularly for those who are not familiar with the patenting process. Because of the varying periods of time



patent applications are in prosecution in the United State Patent and Trademark Office, over the short-term that kind of assessment can be very misleading. Over the longer term, however, for example, since the passage of the Bayh-Dole Act in 1980, the number of patents issued to the university sector is a more meaningful measure.

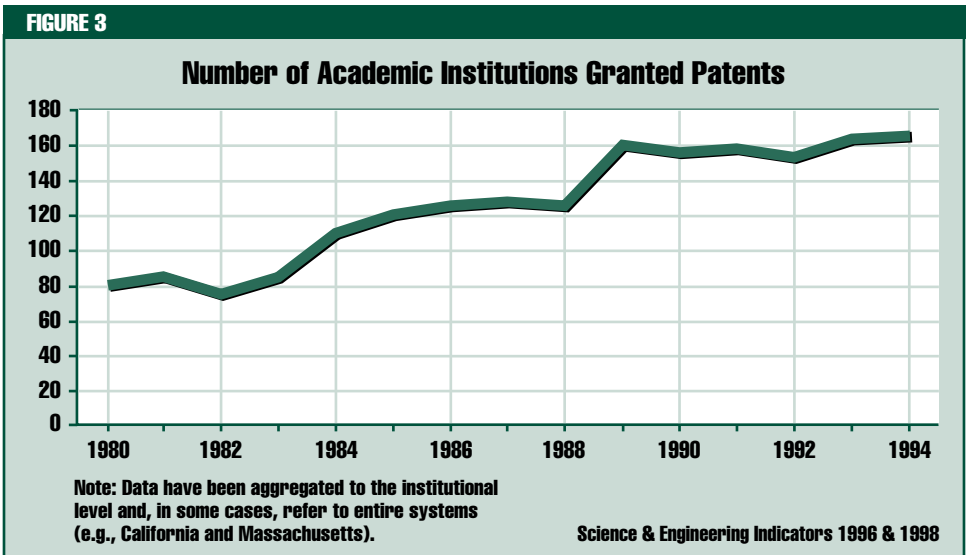
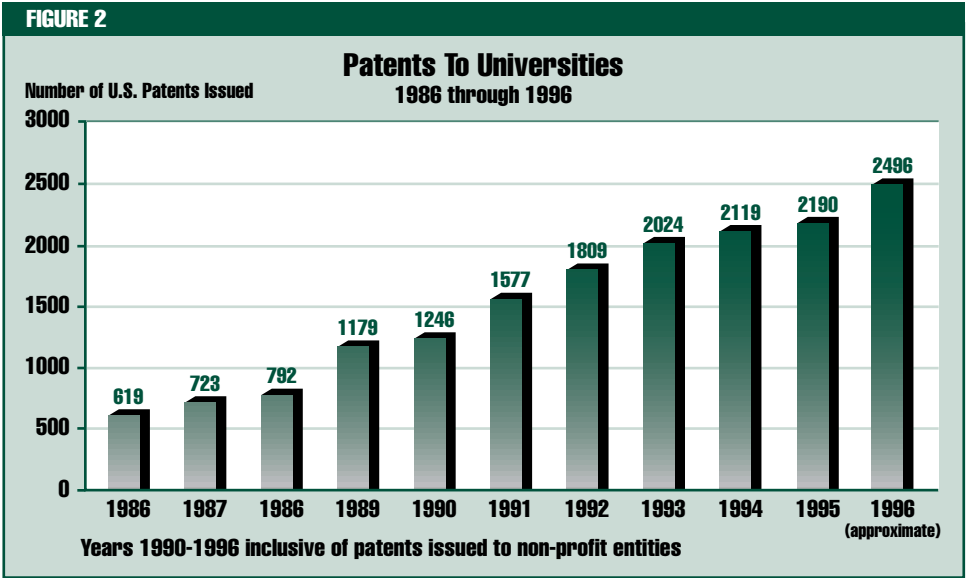
If the total count of patents issued is inclusive of non-profit entities in addition to the universities, as has been done in Figure 2 for the years 1990-1996, the observable impact of the Bayh-Dole Act is even greater.

Perhaps even more significant is the increase in the number of U.S. universities receiving patents. This is strongly indicative of more universities engaging in technology transfer activities. It can be seen from Figure 3 that the number of universities receiving patents doubled form 1980 to 1994. It is reasonable to assume that this was in great measure due to the Bayh-Dole Act.

The real measure of technology transfer is not, of course, the number of patents which the university sector holds, but the amount of technology represented in and by those patents which has been transferred to the private sector for further development into products and processes useful to mankind.

What has been the licensing experience? The most recent licensing survey by the Association of University Technology Managers (AUTM)¹⁴ shows a continuing growth in patenting and licensing activities by the university sector. The data presented in the Survey Summary was utilized by the General Accounting Office in part in formulating its required periodic review of the administration of the Bayh-Dole Act.¹⁵

Licenses and options executed have increased steadily since the passage of the Bayh-Dole Act, representing both an increase in the number of universities engaging in patenting and technology transfer activities and in the increasing activities of those universities already engaged in those functions. In accordance with the GAO report for fiscal 1996, the percent increase from the previous year was 8.4 percent for recurring correspondents in the AUTM survey. About 10.9 percent of the licenses or options granted were to start-up companies. 54.7 percent were to small businesses. Moreover, at the



end of fiscal 1996, the university sector reported 10,487 active licenses or options, the latter being up by 12.9 percent over the previous year. The number of such licensees and options producing income increased by 16.1 percent over the previous year while the income of \$365.2 million generated by those activities in 1996 represented an increase of 22.1 percent over 1995.

Although, the foregoing figures represent the effect of all licensing activities and not only those attributable directly to operation under the Bayh-Dole Act, it is submitted that because of the over-

whelming support of research and development in the university sector by government funding, being 60.2% of all funding in 1995, and the traditional co-mingling of funding by the universities it is legitimate to conclude that the bulk of patenting and licensing activity in the university sector is government-fund driven and falls within the ambit of the Bayh-Dole Act.

Without question, the economic impact of the universities' licensing activities is substantial—estimated, on the basis of the AUTM survey, to add \$24.8 billion to the U.S. economy.

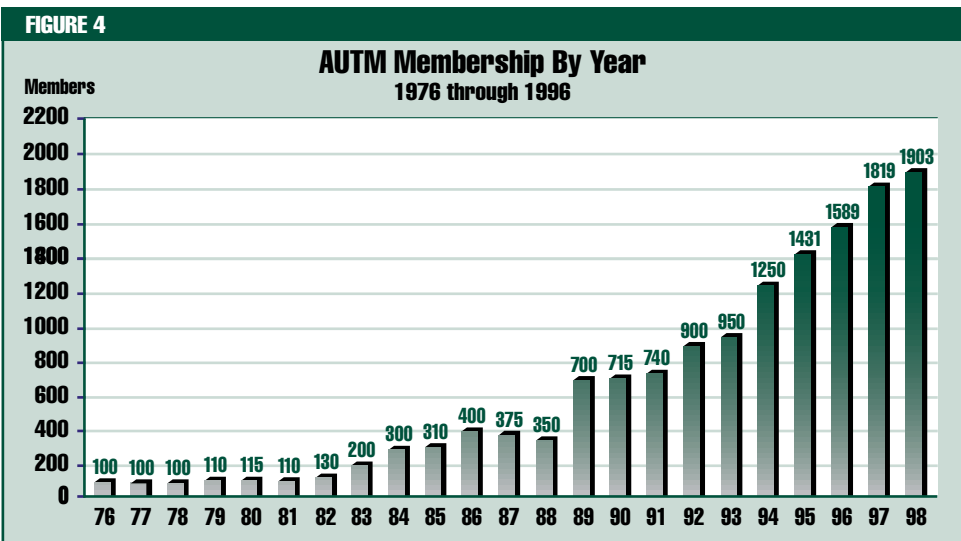
Significant as these figures are, it should not be overlooked that university inventions, arising, as most of them do, from basic research, have led to many products which have or exhibit the capability of saving lives or of improving the lives, safety and health of the citizens of the United States and around the world. In that context their contribution to society is immeasurable.

What is truly remarkable too is that these benefits have been realized and the Bayh-Dole Act has been administered without the necessity for congress to appropriate any of the taxpayers' money for its operation.

Another measure of the effect of the Bayh-Dole Act is the growth of membership in the Association of Technology Managers and its predecessor the Society of University Patent Administrators. That growth, which is graphically shown in Figure 4 is, perhaps, the most direct measure of the interest in and growth of the technology transfer functions in the university sector. It also evidences the creation and growth of technology transfer as a professional calling.

The Heritage of the Bayh-Dole Act

The Bayh-Dole Act can be given credit for focusing congressional interest on intellectual property-oriented legislation. With that focus established, the years since have seen many pieces of such legislation introduced. Some have become law, most have not. One piece of legislation which could be consid-



ered to have been almost directly spawned because of or as the result of the Bayh-Dole Act is the Federal Technology Transfer Act of 1986 (FTTA). That act was introduced as an amendment to the Stevenson-Wydler Act of 1980 which had been intended to promote the utilization of technology generated in government laboratories, but was singularly unsuccessful in accomplishing that goal.

The FTFTA was largely a response to the increasingly tough international competition facing the United States and the prevalent complaint that “the US wins Nobel Prizes while other countries walk off with the market.” The designers of the FTFTA built the act under certain fundamental principles:

- The federal government will continue to underwrite the cost of much important basic research in scientifically promising areas that takes place in the United States.
- Transferring this research from the laboratory to the marketplace is primarily the job of the private sector, with which the federal government should not compete.
- The federal government can encourage the private sector to undertake this by judicious reliance on market-oriented incentives and protection of proprietary interests.

The principles enumerated were first tested through experience with the Bayh-Dole Act and the FTFTA responded to the lessons learned from that law, perhaps the most important of which was its success in promoting university-industry cooperation.

The FTFTA is, clearly, a direct highly beneficial legacy of the Bayh-Dole Act, as has been additional legislation designed to expand the use of the results of research carried out within government-owned government operated laboratories by expanding the licensing opportunities for those laboratories.

Commentary

The growth of technology transfer has taken place over the last 30 years in an environment that slowly progressed from hostile to favorable. That progression was given major impetus by the passage of the Bayh-Dole Act. During that period we have seen a dramatic change in the attitude of the Justice Department and the interpretation of the anti-trust laws where patents and anti-trust are no longer viewed as antithetical. We have seen a move toward a favorable statutory basis under which we have much greater freedom to operate. We have had an active effort by various administrations to obtain equitable treatment for U.S. citizens in foreign venues, both in trade and intellectual property pursuits. We have had numerous and far-reaching changes in the patent laws of those foreign venues for example the Patent Cooperation Treaty which provided greater opportunities for technology transfer to these venues. We have also experienced extensive changes in our own patent laws and practices which have further expanded the opportunities to engage in technology transfer. We have had the benefit of a knowledgeable court in the Court of Appeals for the Federal Circuit which has slain many of the mythical dragons attached to intellectual property law to provide uniformity of interpretation of those laws and before which we can expect equitable treatment. We have obtained the attention of Congress and, particularly, the attention in that body to the university sector’s perspective on intellectual property law issues. We have seen the introduction and passage of legislation favorable to the universities and their technology transfer efforts. We have also seen developed, not only in the university sector, but in university-industry relationships and university-industry-government relationship, a greater awareness of technology transfer and a growing recognition of the possibilities which can be made available through creative technology transfer efforts and a much greater sophistication in handling

those possibilities. Today we operate in a climate that recognizes the value of intellectual property and the technology transfer function. We would like to think that much of this has come about because the universities, as a source of fundamental discoveries and inventions, have been the source of enlightenment for a recognition of the value of innovation.

A word of caution, however! We work in a very uncertain business where, on the average, it takes in excess of 10 years and hundreds of thousands, even millions, of dollars to bring an invention to the marketplace. We must also remember that, as a licensor, we have very little actual control over the process by which an invention is brought to the market or how, ultimately, it is marketed. We are always vulnerable to the attacks of special interest groups, whether inside or outside of government, which are based not on fact but on emotion or which may be waged for psychological reasons. As long as envy and jealousy are part of the human condition such attacks are inevitable, only the intensity will rise and fall.

The emphasis today, as well as the “buzzword” in Washington is “competitiveness.” That the university sector has made a tangible contribution to the competitiveness of the United States in a global market through the technology transfer function cannot be denied. The seminal piece of legislation which made that contribution possible was the Bayh-Dole Act. Without doubt, the objectives¹⁶ of the Act have been realized. Through operation under that Act:

- Small business, which is frequently the test bed for embryonic university technologies, has benefited to a very large extent;
- the government is comforted in knowing that taxpayer dollars, which support the bulk of basic research in the university sector, have led to the development of products and the use of processes that have advanced the quality of life for its citizens.
- industry can rely on a source of technology, data and information and a pipeline of manpower which fulfills its needs and feeds the production processes.

In sum, all sections of society enjoy both the protection and benefits afforded under the Bayh-Dole Act and its progeny.

In recent years we have been experiencing an increasing incidence of efforts to restrict or curtail the technology transfer capabilities of the University sector under the Bayh-Dole Act through government agency actions, agency programs and legislative activities and through agency-industry consortiums. For example, pending legislation would disenfranchise the universities, as well as other non-manufacturing entities utilizing the patent system, from exercising the constitutional-based right vested in the patentee to exclude others from practicing the invention patented.

We must understand that no matter how much money we spend on research and development the findings are not going to benefit the public unless there are suitable incentives to invest in commercialization. And because no one knows which venture will succeed, we must strive for a society and an environment ruled by the faith that the guarantee of reasonable profits from risk-taking will call forth the endless stream of inventions, enterprise and art necessary to resolve society’s problems. The words of the poet Edna St. Vincent Millay seem most apropos to this situation.

We have already passed through an era where science was being made subservient to politics. In today’s technologically intense atmosphere, where the maximum protection for intellectual property is more than ever necessary to provide protection for the heavy investment necessary to technology development, we must remain alert.

Even in the current favorable climate for university technology transfer as the heritage of the Bayh-Dole Act, views on the issues in the control of intellectual property, whether by government or special interests, can lend themselves to emotional molding. Outspoken claims to the guardianship of the public interest or welfare is a rich field for cultivating political power. We must never forget that freedom demands a constant price and that vigilance is essential. To quote Pogo, “We have met the enemy and he is us.”

In the struggle to obtain the passage of the Bayh-Dole Act as well as on other pieces of proposed legislation which impinged on the university sector, the universities, collectively, spoke with a loud and single voice. We must continue to do so in all circumstances which threaten the rights and opportunities which we have earned over many years by dint of perseverance, patience and hard work. This will require a unified, active and continuing participation by all members of the university sector.

“The heritage of the past is the seed that brings forth the harvest of the future.”¹⁷

Endnotes

- 1 Vannevar Bush held the following positions in government: Chairman, National Defense Research Committee 1940; Director-Office of Scientific Research and Development 1941; Chairman-Joint Research and Development Board 1946-47; Member-Research and Development Board of National Military Establishment 1944-48.
- 2 Harbridge House, Inc., Government Patent Policy Study for the FCST Committee on Government Patent Policy, May 15, 1968 Vol. II, Parts II and III.
- 3 See Resume of U.S. Technology Policies—Dr. Betsy Ancker-Johnson-Les Nouvelles (Journal of the Licensing Executives Society) Dec. 1976, Vol. XI No. 4, P. 186; Statement before the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, Dec. 11, 1976. (This latter document also contrasts the experience of universities in licensing patents owned by them, some or most of which may have resulted from research supported in whole or part by Federal monies.)
- 4 Presidential Memorandum and Statement of Government Patent Policy (F.R. Vol. 28, No. 200, October 12, 1963).
- 5 Presidential Memorandum and Statement of Government Patent Policy (F.R. Vol. 66, No. 166, August 26, 1971).
- 6 For historical interest re Institutional Patent Agreements and early DHEW practice see Report to the Congress on “Problem Areas Affecting Usefulness of Results of Government-Sponsored Research in Medicinal Chemistry” by the Comptroller General of the United States, August 12, 1968.
- 7 P.L. 96-517, Patent and Trademark Amendments Act of 1980. This law amended Title 35 United States Code by adding Chapter 18, Sections 200-212.
- 8 *Diamond, Commissioner of Patents v. Chakrabarty*, 206 USPO 193, U.S. Supreme Court.
- 9 § 200. Policy and objective. “It is the policy and objective of the congress to use the patent system to promote the utilization of inventions arising from federally supported research or development; to encourage maximum participation of small business firms in federally supported research and development efforts; to promote collaboration between commercial concerns and nonprofit organizations, including universities; to ensure that inventions made by nonprofit organizations and small business firms are used in a manner to promote free competition and enterprise; to promote commercialization and public availability of inventions made in the United States by United States industry and labor; to ensure that Government obtains sufficient rights in federally supported inventions to meet the needs of the Government and protect the public against nonuse or unreasonable use of inventions; and to minimize the costs of administering policies in this area.”

- 10 OMB Circular A-124 was subsequently codified as 37CFR Part 401.
- 11 The Presidential Memorandum was incorporated into the text of OMB Circular A-124 on March 24, 1984.
- 12 PL-98-620, The Trademark Clarification Act amended Chapter 18 of Title 25 U.S.C.
- 13 Final rules were published on March 18, 1987 (52 FR 8552) and subsequently codified at 37CFR Part 401.1-401.16.
- 14 AUTM Licensing Survey 1996, Survey Summary, 1997.
- 15 Technology Transfer—Administration of the Bayh-Dole act by Research Universities, GAO, Report to Congressional Committees May 7, 1998.
- 16 See note 9.
- 17 From a tablet affixed to the front of the National Archives in Washington D.C.

About the Author

Upon graduation from the University of Wisconsin College of Law in 1949, **Howard Bremer** began his career as a patent attorney with The Procter & Gamble Company. He remained there until 1960 when he left to become Patent Counsel at the University of Wisconsin's Wisconsin Alumni Research Foundation, a position he held until 1988. Since 1988, Bremer has served as consultant to WARE.

Bremer has served as Secretary, Vice Chairman and Chairman of the Patent, Trademark and Copyright Section of the State Bar of Wisconsin. He also served as President and Board member of the Wisconsin Intellectual Property Law Association. With COGR, Bremer served on the Patent, Copyright and Rights in Data Committee and the Grants and Contracts Policies Committee. He further served as President and Trustee of the Association of University Technology Managers.

Bremer has prepared several statements of position on university patent procedures and government patent policy and has delivered testimony before Congress on behalf of COGR and other university associations. Bremer remains active in patent matters with both the American Bar Association, Special Committee on University Intellectual Property Law and its Committee on Cooperation with Foreign Patent Office. He also is active with the American Intellectual Property Law Association as Chairman of its University Relations Committee.

He is a widely published and respected expert on patents, technology transfer and rights in data.

SPONSORED PROGRAMS OFFICES IN HIGHER EDUCATION: A CONTINUING EVOLUTION RESPONDING TO FEDERAL REQUIREMENTS



JULIE T. NORRIS AND JANE A. YOUNGERS

Introduction

Administration for externally sponsored programs at colleges and universities is a relatively recent phenomenon. Whether called research administration, sponsored programs administration, grants management, or any number of a host of names, this activity thrives as a result of the availability and receipt of increasing amounts of federal funding prompted in large part by the Cold War and space race which began in earnest with the launch of USSR's Sputnik.¹ Likewise, the organization, structure, and responsibilities vested in research administration offices differ widely from institution to institution and depend on a number of factors including institutional size, mission, and culture.

For the most part, the receipt of federal funds has had a profound impact on the nature of colleges and universities. In addition to being a primary factor in the establishment, growth and maintenance of research and graduate programs, the existence of federal funding has also shaped institutional administrative systems, policies and procedures. Unfortunately, the proliferation of federal regulations and unfunded mandates has not always had a positive impact on research results or administrative efficiency.

This paper will trace sponsored programs administration over five eras: from its earliest years (for some institutions, this was pre-World War II), through the flood of federal funding of the 1960's, the proliferation of stricter regulations and financial auditing in the 1970's, and the explosion of unfunded mandates which began in earnest in the 1980's and continues to the present. Finally, we will look at the future of sponsored programs administration as we move into the next millenium. A recurring theme in these five sections will be the changing roles of sponsored programs offices.

The Early Years

In the two decades following the end of World War II, sponsored research activities began to play a prominent role in the fabric of higher education. The impetus came not only from the influences of WWII and the Manhattan Project but also from international conflicts in the fifties such as the Korean conflict, the initial Soviet conquests of space, and the beginning of technological growth on both a national and international level. As research funding at colleges and universities grew from approximately \$15 million in 1940 to \$1.3 billion in 1966,² it became apparent that federal funding would provide a significant portion of the research budgets of our colleges and universities.³ Beginning with the Department of Defense and the Atomic Energy Commission and expanding to the National Institutes of Health, National Science Foundation, and the National Aeronautics and Space Administration, funding levels increased and, along with those increases, requirements for management and administration of federal research funds also developed and prospered.

A 1973 study of university research administration functions and organizations described the early growth of offices of sponsored programs.⁴ In this study of 144 sponsored research offices (both public and private) established prior to 1973, the period of establishment was reported as follows:

1945	1950	1955	1960	1961-1965	1970	1973
5	5	6	18	44	53	13

This growth is postulated to correlate with the scrutiny of research administration functions at colleges and universities both internally and by the federal government.

In the early decades there was little specific direction, policy, or concern expressed over the manner in which institutions managed the federal funds they received, and there were virtually no non-financial compliance requirements tied to the receipt or management of those funds.

In the 1950's and early 1960's, most research administration/sponsored programs offices reported to academic vice presidents or to graduate deans.⁵ Part of the reason for this reporting relationship was a response to the issues that federal funding at universities posed: roles and responsibilities of faculty members as funded research became an increasingly important institutional function, the training of graduate students, the potential neglect of teaching, the growth of research centers separate from academic departments, and the degree to which research was a criterion in tenure and/or promotion. A 1954 report of the American Council on Education stated these pressures succinctly:

*“The Committee believes ... that sponsored research in educational institutions may be expected to continue for many years and ... the problems of long-range policy thus raised affect ... all institutions of higher learning in America. Consequently the establishment of wide and stable policies ... for the management of this research is important for sponsoring agencies and educational institutions alike.”*⁶

The report continued by recognizing the crucial importance sponsored research has been to educational institutions: it has expanded the quality and quantity of research in colleges and universities; it has contributed toward the advanced education of students; it has provided research equipment to institutions; and it has enlarged thesis opportunities and allowed people to gain skill in cutting edge research techniques.

These early reports focused almost exclusively on the development of broad, institutional policies for accepting and using federal funds to support both the research and education missions of

institutions. With the increasing recognition at both federal and institutional levels of the importance of external funding for research, the emphasis at many institutions of higher education was placed on the search and identification of sources for such funding and on processing proposals created by faculty members through institutional bureaucracies to funding agencies. During these early years the focus was mainly on acquiring the funds and less on managing them after they were received. In fact it was not until the 1970's that government-wide policies which defined standards for administrative management of those funds were broadly adopted. What compliance regulations were included in research awards focused almost exclusively in financial areas, such as transferring of funds between award categories and restrictions on foreign travel. Research administrators today would be envious of the limited restrictions on administrative management requirements of the 50's and early 60's.⁷

In the years immediately following WWII, even the requirements for submission of proposals were far less encumbered than they became in later years. Agencies generally did not specify formats, page limitations, or type sizes. Deadlines were more fluid, and the process of negotiating awards was more flexible. What has become commonplace in the last fifteen years (such as representations, certifications, and assurances) were either nonexistent or minimal in those years. Sponsored programs offices focused on such mundane tasks as adding proposal budgets, ensuring that salaries were accurate and that fringe benefits were applied appropriately, and that proposals reaching their offices had appropriate authorizing signatures at required institutional levels. Little attention was placed on areas such as utilization of animals and humans in research, compliance with civil rights, and equal employment opportunity legislation, etc.

Stated another way, faculty members looked at sponsored programs offices as sources to identify potential sponsors and as administrative support offices to ensure that proposals were editorially correct and that budgets were accurate. At some institutions, the sponsored programs director was involved in the creation and implementation of research policies and procedures as recognition of the need that stewardship of the increasing amount of federal money was necessary and appropriate. But, as one can tell from the numbers of such offices in the early years, it was not until the 1960's that research administration offices began to come of age as a necessary and important part of the institutions they served.

The Flood of Federal Funding

The Soviet Union's launch of the Sputnik satellite was the dawn of a new age in federal funding for research and other sponsored activities on college and university campuses. That funding increased from \$405 million in 1960 to \$1.7 billion in 1970.⁸ As mentioned previously, this era brought the establishment of many more centralized research administration offices, and throughout this period the roles and responsibilities of these offices continued to be defined. Certainly, the beginning of this period found the typical sponsored programs office, and particularly those which were organized within traditional academic or graduate school lines, collecting and disseminating funding information to faculty and other interested campus personnel. There was special emphasis on assistance with proposal development, preparation, and production. Assurance of fiscal accountability was provided by the institution's general financial system.

However, there was little uniformity on the federal level with respect to the requirements necessary

to apply, receive and administer research and other funding. In 1966, the Bureau of the Budget issued a report describing the administration of government supported research at universities. In its introduction, the report stated that

“This report was undertaken in response to the executive branch’s continuing concern that its research programs be well managed. Specifically, it attempts to identify those administrative procedures which will foster excellent research, assist in strengthening the institutions engaged in federal-ly-funded research, and guarantee prudent stewardship of public funds.”⁹

The authors of the 1996 report interviewed individuals at five federal agencies, thirteen universities and five private foundations.¹⁰ The report was organized into four specific sections: statement of major issues, recommendations on basic policy issues, proposals for improving agency organizations and procedures for administering research programs, and administrative improvements relating to specific terms and conditions for research grants and contracts. The last two sections of this report are of particular interest here.

The report noted that “the growth in Federal research support also creates problems for the universities [including] the development of more sophisticated business systems required to handle Federal funds.”¹¹ The report goes on to note that, in recent years (pre-1966), Congressional attention began to be focused on the administration of federal funds and that Congress had noted a number of administrative deficiencies in some federally-funded research programs. The report made a number of recommendations to “increase the effectiveness of the Federal Government’s management of its university research programs.”¹² The recommendations included several, which would have an impact on sponsored programs requirements and activities. Of interest to today’s research administrator was a recommendation that a traditional fixed price contract should be used only in circumstances where “a specific service or piece of hardware is the end product; the research to be conducted is to be directed toward the solution of a specific operating problem of the agency; the agency finds it necessary to exercise control over the objectives, direction, specifications, costs, or methods of the research and precise scheduling must be followed; and the research to be conducted is classified.”¹³

The report further states that a standard instrument should be developed for all other circumstances and that

“. . . terms and conditions of the agreement, e.g., fiscal and technical reporting, handling of equipment, travel arrangements, etc ., would be consistent with the unique requirements for the conduct of university research and have the simplicity and flexibility traditionally associated with the grant.”¹⁴

The report also made certain recommendations focused on increasing the flexibility in the conduct of research (such as allowing rebudgeting of funds) and recommended that data be collected on a principal investigator’s research portfolio, data not unlike that collected today as current or pending support.

Examining federal processes and procedures, the report concluded that agencies needed to look at providing flexibility to investigators in performing research tasks by, among other approaches, selecting the appropriate funding instrument depending upon the work performed. At the same time the report identified areas in which the universities were expected to maintain appropriate management controls and standards, including:

- the formulation of standards of administration for handling federal funds,
- clearer understanding by principal investigators of their responsibilities in expending federal funds
- an internal proposal review to ensure that the proposal is consistent with the purposes of the institution and the agency
- adequate accounting and administrative services

During this era, the role of sponsored research administration offices continued to evolve. A 1972 study by Willner and Hendricks quoted in Steinberg's doctoral dissertation in 1973¹⁵ noted seven basic responsibilities of an office of grants administration:

1. The identification of federal programs which might support projects of interest to the faculty,
2. Communication of information regarding programs to the faculty and the transmitting of faculty interests to appropriate government agencies,
3. Assistance in the preparation of proposals,
4. Administration of grants from the time of award to the time of completion,
5. Acting as a campus-based Washington liaison for the university,
6. Maintaining contacts with other universities and related organizations for aid in the solution of grant administration problems, and
7. Keeping informed of changes in grant policies and procedures.

Steinberg noted a trend toward the establishment of separate proposal development sections in those offices.

Quoting from a study in 1967 by Eurich, Beasley, *et al.* noted the following description of the administrator of sponsored projects:

*“The administration of sponsored research in the university is one of the crucial areas in this whole field. For here the university and the surrounding society work out the terms of their symbiotic relationship. The university needs the wherewithal to pursue its knowledge-producing activities; the society needs the collective brainpower, which the university represents. How the needs of each can be met without violating the rights of any is an increasingly delicate and complex problem. The man who administers research is at the interface between the university and society. And interfaces mean friction, constant change, wear and tear.”*¹⁶

As the era the present authors have dubbed as the “Flood of Federal Funding” drew to a close, the once pervasive emphasis of the sponsored research office on proposal processing had shifted to encompass other areas of concern to senior administration and federal funding officials alike. Assuring accountability and proper monitoring of federal funds and requirements had become as important as assisting faculty in locating sources of support and preparing their proposals. The results of the Steinberg¹⁷ study bear this out. While 95% of respondents indicated they were involved in pre-proposal activities and proposal preparation, 64% were also involved in active account administration such as monitoring accounts and negotiation of overruns and extensions. Thirty-two percent were involved in accounting and fiscal activity, defined as cost control procedures, fiscal reports for sponsors, and the computation of indirect cost rates. The Steinberg study also noted that few offices considered themselves organized by specialties such as organization by sponsor or academic department. This, too, was to change, as the fundamental relationship between academe and government, often referred to as a partnership, would shift.

The Proliferation of Regulations

The mid-70's to late 80's are often viewed as the period of the greatest growth of regulation and compliance activity in the research enterprise. Universities have always recognized their responsibility for proper stewardship of research funds, and for appropriate conduct of research. This era, however, was characterized by the increased involvement of the federal government in assuring the fulfillment of these responsibilities. Federal funding for research grew at a phenomenal rate during these years (from \$2.5 billion in 1976 to \$9.0 billion in 1989),¹⁸ and the federal government focused increased audit attention on educational institutions. OMB Circular A-21 was reissued in 1979 and modified three times between 1979 and 1987. Of equal importance was the issuance on July 1, 1976, of OMB Circular, A-110, "Grants and Agreements with Institutions of Higher Education, Hospitals, and other Nonprofit Organizations: Uniform Administrative Requirements," an outgrowth of the Bureau of the Budget 1966 report. This Circular's purpose was to promulgate "standards for obtaining consistency and uniformity among federal agencies in the administration of grants to, and other agreements with, public and private institutions of higher education, public and private hospitals, and other quasi-public and private nonprofit organizations."¹⁹

This particular Circular significantly affected the growth of sponsored programs offices across the country. For the first time, the federal government codified the wide-ranging and often unclear administrative regulations and requirements for grants and cooperative agreements into a single document. In 1993, the Circular was revised and reissued. It required federal granting agencies to implement the provisions of the Circular but, in some cases, allowed the agencies to issue agency-specific implementation guidelines.

The Circular focused on administrative management of grants and cooperative agreement awards to colleges and universities. It specified the maximum requirements that agencies could impose on recipients and the minimum the recipient would need to do to maintain adequate systems for the management of such awards. In its original issuance, the Circular included a series of appendices which described appropriate systems (such as financial systems, purchasing systems, property systems, systems for applying for federal funding, etc.). Perhaps as much as any specific issuance in the 1970's this circular provided a framework for administrative management of awards, was a catalyst in institutional development of sponsored programs offices and, in some cases, of the beginning movement toward combining pre-award and post-award sponsored programs functions into a single office.

There were two other significant themes in the '70's and '80's which influenced the development of sponsored programs offices: increased federal emphasis on audit and an explosion of federal regulatory and compliance requirements.

As an example of the former, one need only to point to the passage of the Single Audit Act of 1984, P.L. 98-502, and its implementation via OMB Circular A-128 (Audits of State and Local Governments)²⁰ on April 12, 1985. Not only did the government specify requirements for financial audits, the Circular also addressed requirements for compliance with a host of administrative regulations by stating that the auditor shall determine whether "the organization has internal accounting **and other control systems** (emphasis added) to provide reasonable assurance that it is managing Federal financial assistance programs in compliance with applicable laws and regulations."²¹ This audit was to include a review of subrecipient organizations and their compliance with such regulations as the Davis-Bacon Act, Civil Rights Act, and Drug-Free Workplace in addition to

the normal requirements for financial compliance and cash management.

Certainly it was matters relating to finances that were the driving forces in the further development of sponsored programs offices in these years and in the recognition of their critical role in the research enterprise. Auditors' attention was directed not only at issues related to cash management and financial reporting processes, but also at the myriad of areas where the federal government had requirements for agency review and approval (items of equipment, travel which exceeded certain dollar thresholds, transfer of funds between categories, etc.). The expenses naturally were collected and reported by the institutional financial system, but the institutional and agency approvals for deviations from initial budgets were generally handled by sponsored programs offices. Although not universally true, one can point to the role of sponsored programs personnel in the issuance, monitoring, and managing of sub-recipient agreements as symbolic of this growth.

Ray Woodrow's seminal publication, "Management for Research in U.S. Universities," illustrates this change.²² Woodrow argues that prior to the 1970's the sponsored programs officer's principal role was that of identification of funding sources and processing of proposals. Woodrow points out that by the mid 1970's that role had expanded to include negotiating with sponsors on terms, conditions, and budgets of grants and contracts; officially accepting awards on behalf of the institution; monitoring active research projects and ensuring implementation of all sponsor requirements; and aiding in the completion and termination of research projects.²³

Attention now turned toward compliance with a host of new regulations in three generic areas: Individual Rights and Responsibilities; Protection of the Environment and of Living Organisms; and Fraud, Waste, and Abuse.

In the area of individual rights, the years between the early 70's and the late 80's saw the issuance of regulations pertaining to employment of the handicapped (1973), sex discrimination (1972), age discrimination (1975), affirmative action for the disabled and Vietnam veterans (1972), and protection of workers in labor surplus areas (1980). Further, the government became concerned about protecting both the environment and living organisms in that environment. Thus, Congress passed laws on clean air and water (1970), hazardous materials (1970), human subjects (1986), recombinant DNA (1986), and strengthened already existing regulations on the use of animals in research. In addition, universities began seeing a host of regulations related to fraud, waste, and abuse. Included among these were regulations concerning debarment and suspension (1986), anti-kickback (1986), misconduct in science (1987), and procurement integrity (1988).

The common thread in all of these regulations (and a host of others passed during the same years) was a requirement for institutions of higher education to provide an assurance or a certification that they complied with these regulations and had institutional policies and programs to ensure that compliance. Somewhat glibly, this has been called the period of "the regulation of the month club," but it is important in the development of research administration offices. The responsibility for compliance with this wide-ranging host of regulations did not lie exclusively in the sponsored projects office. Generally a personnel or human resources office was responsible for the protection and guarantees of individual rights. Most of the environmental protection regulations were the responsibility of the physical plant, although responsibility for humans and animals was vested in a research office or an academic vice president's office. Responsibility for regulations controlling fraud, waste, and abuse were generally distributed among financial offices, sponsored programs offices, and academic vice president's offices.

No matter how distributed, in virtually all colleges and universities the sponsored programs director was officially identified (or identified by default) as the individual responsible for coordinating and ensuring that the institution met all these responsibilities. As it became more common for sponsored programs officials to be delegated the responsibility for signing proposals and negotiating and accepting awards, their role became more central since they were, as individuals, certifying regulatory compliance on behalf of the institution. They became the focal point within institutions to ensure compliance, across the board, with federal regulations. As the years have passed, the role of sponsored programs offices have continued to change, but the responsibility for compliance with federal regulations has not only remained in sponsored programs offices, but has become recognized as a primary responsibility of such offices.

In April of 1989 the Council on Governmental Relations, in response to the wide-ranging requirements placed on institutions through these two decades for management of externally funded sponsored activities, issued its first edition of a document entitled "Managing Externally Funded Programs at Colleges and Universities: A Guideline to Good Management Practices."²⁴ It suggested good management principles and practices, and provided indicators to test those practices. By looking at the list of areas covered in the document (fiscal administration; procurement; property management; personnel; audits; health, safety, and regulatory compliance; grant and contract management; records management; intellectual property; ethics and conflicts) one can fairly easily identify those areas which are a primary responsibility of most sponsored programs offices and recognize how the role of such offices has changed through the years.

Unfunded Mandates

While the 1960's and 1970's brought exponential increases in federal support to colleges and universities and, in the regulatory arena, made institutions subject to a whole series of socio-economic regulatory policies, the 1980's continued the imposition of additional federal regulations, most coming in a series of unfunded mandates grounded in legislative requirements. Some of these were in the financial area as costing regulations (primarily OMB Circular A-21) were further refined. Others were in areas of public policy and perception, running the gamut from substance and alcohol abuse to misconduct in science; from integrity in the procurement process to the reporting and management of real or potential financial conflicts of interest. While many institutions already had procedures to deal with conflict of interest and financial and scientific misconduct, the new regulations were very prescriptive of the form these procedures must take. Finally, audits began to place an emphasis on non-financial compliance. As a result of these federal initiatives, the roles of sponsored programs offices and research administration activities on campuses continued its shift from pure service functions to control and compliance as a primary directive. For many in the research administration field, this was a profound, and not always welcome, change.

The first series of regulations were those issued by the National Science Foundation, the Public Health Service and the Office of Naval Research beginning in 1987 pertaining to misconduct in science. All institutions were required to adopt policies and procedures implementing the regulations. While the majority put new special committees in place to deal with allegations of misconduct and named senior academic officials to coordinate any actions under the regulations, the sponsored programs administrator found him- or herself the interpreter of the regulations and, in most instances, an integral player in any action taken under the regulation.

The next series of regulations had to do with the use and abuse of controlled substances and alcohol. Beginning with the Drug Free Workplace Act of 1988 and continuing through to the Drug-Free Schools and Campuses Act which was enacted in 1989, sponsored programs officials once again became interpreters of regulation. In addition, they were placed in the role of submitting assurances and certifications to federal agencies as well as in playing integral roles on their campuses in the implementation of the regulations.

Conflict of interest, particularly as reflected in the financial holdings of principal investigators and other key personnel, was the next major compliance initiative in which sponsored programs administrators began to play a key role. With regulations promulgated by the National Science Foundation and the Public Health Service, the research administrator was often the initial drafter of implementing policies and procedures, the collector of disclosure forms, the proposal certifier, and many times, once again, an integral player in any determination of real or potential conflict of interest.

Perhaps the most profound change for college and university research administrators resulted from the unfortunate incidents in the early 1990's concerning the calculation of indirect costs. An investigation which reached all the way to the U. S. House of Representatives centered around the costing practices of one West Coast university but which had ramifications for all institutions of higher education. The changes which were incorporated in OMB Circular A-21 at that time and the subsequent refinements have had significant impact on college and university research administrators.

Among the changes were the capping of administrative costs, the specification of cost categories as either direct or indirect, identification of certain costs as unallowable, incorporation of four of the Cost Accounting Standards into the Circular, and a certification requirement that facilities, depreciation or use recovery for research facilities was indeed used for that purpose.

While all of the above changes were consequential to institutions, particularly the capping of the administrative rate components, two held special significance for the research administrator. The first of these was the definition of indirect and direct costs as it pertained to departmental administration (Section E.6.b. of OMB Circular A-21). For the first time, regulations specified what could normally be considered a direct or an indirect cost as it related to the administration of grants. That the government chose to make those definitions subjective by the use of the word "normally" has, consequently, made the sponsored programs administrator not only the interpreter of the regulation but the promulgator of institutional policies and the enforcement official of such guidance.

Cost accounting standards integrated into OMB Circular A-21 also became a major focus of the research administrator. Because CAS Standard 501 specified consistency in proposing, accumulating, and reporting costs, the pre-award and post-award functions of research administration became compelled to act in concert with each other in assuring that the standard was followed. Sponsored research administrators found themselves playing an active role both in the budget development process and the ensuing financial and administrative requirements related to the accumulation and reporting of costs represented in the proposal budget. Recent emphasis by federal auditors on cost sharing is illustrative of the continuing need for involvement of sponsored research personnel across the continuum of the research enterprise.

The complete opposite of all of these unfunded mandates was an initiative begun in 1986 called the Florida Demonstration Project. Now renamed the Federal Demonstration Partnership (FDP), the FDP has represented a renewing of the partnership between the federal government and the higher

education community in the area of streamlining research administration policies and practices. The original Florida Demonstration Project is seen as responsible for the universal adoption of the “expanded authorities” for research projects into Circular A-110. Those expanded authorities include an authority to expend funds ninety days in advance of award, institutional approval of no-cost extensions, and automatic carryforward of funds into the next budget period. In its current phase, the FDP consists of 65 institutional members, 11 federal agencies, and five professional organizations. With a set of unified grant administration policies and regulations for all participants, the FDP has broadened its scope. In a 1997 article, Barbara E. Siegel, Chairperson of the FDP, noted that the scope now “emphasizes demonstrations that combine electronic research administration and reengineering systems and procedures, with increased productivity and stewardship and decreased administrative burden.”²⁵ With the inclusion of faculty representatives to the FDP, the potential for real streamlining of redundant requirements and certifications may be obtained.

Local events on campus also began to change the role of many sponsored programs offices as reengineering efforts began in the late 1980’s and early 1990’s. Organizations sought to “re-invent” themselves to allow for maximum efficiency and service to the campus community. As a result, many institutions began to look at research administration functions, eliminate duplication and, on some campuses, combine various units of research administration into one-stop service centers on either a decentralized or centralized basis.

As the millenium approaches, the sponsored research administrator now finds him- or herself embarking on another great change—that of the incorporation of electronic technology into all aspects of research administration.

The Next Millenium: The Future is Electronic

One of the most exciting aspects of the next millenium with respect to a sponsored programs office is the change brought by technology creating additional challenges. These changes are not, of course, limited only to what happens in sponsored research offices but are changes that will become apparent across the institution.

A few examples will illustrate this: Faculty and researchers are, more than ever before, accessing research opportunities via the internet, downloading proposal guidelines, downloading forms, and completing proposals either using some type of word processing equipment themselves or giving handwritten text to support staff and students using such equipment. At the end of the process, research financial offices (whether as a part of or distinct from sponsored programs offices) are preparing invoices electronically, drawing down cash from federal systems electronically, and submitting financial reports using electronic media. Faculty, at the end of the process, are writing and submitting technical reports electronically and the institution is submitting close out documentation, technology transfer reports, and property reports using some type of automated system. These types of activities are occurring now.

What will change as we move to the future? There are four distinct changes institutions (generally through their sponsored programs offices) must prepare for:²⁶

- the dramatic increase in activity at the federal agency toward using electronics to do the business of research management
- the corresponding need at the higher education level to respond with electronic systems to handle the institutional half of the electronic research administration partnership

- the emergence of a new profession – computer specialist in research administration, and
- the use of electronic and computerized systems to help meet regulatory and compliance mandates of the government

Sponsored programs administrators—in responding to these new challenges—will have to change. Critical will be the ability to use technology, to understand how to develop and implement systems using these tools, and to help faculty and other principal investigators to adapt to this new way of doing business. There will be dramatic changes within the sponsored programs offices, also. One current example of such a change: where sponsored programs offices traditionally did funding searches for faculty and identified specific potential sponsors for the faculty member's research program, an increasing number of sponsored programs offices are now concentrating on teaching faculty members the best and most efficient ways to access the myriad of information available on the internet.

As the new century begins, institutions will routinely prepare and submit proposals, receive awards, and submit financial invoices and receive payments electronically. The use of electronic data interchange and other data transmission means will become routine as institutions and agencies become more proficient in this new mode of operating. These changes are particularly important as institutions of higher education focus on the future and consider how processes and activities will be influenced by the exciting technology of the next decade.

There will be no lessening of what we have seen in the 90's with respect to transferring regulatory and compliance responsibilities to recipients of federal funds without the funding to implement such mandates. The challenge to research administrators in universities will be to use the tools that are and will become available to ensure appropriate stewardship of these funds. The growth of sponsored research offices in the last 30 years was, in no small measure, an outcome of these compliance requirements. It is ironic but, as funding for administrative activities at colleges and universities has become more and more restricted, the government has imposed more and more responsibility on institutions for management of their own research affairs. This is welcome in many areas since faculty and researchers have greater latitude in using their funds and institutions can provide the flexibilities to faculty that the Bureau of the Budget study recommended in 1966. It does, however, cause institutions to move beyond the reengineering activities of the 90s and explore still newer approaches to these same problems.

Electronic and computerized systems can provide immense value in ensuring that institutions do, in fact, comply with basic governmental requirements and, at the same time, allow the research administrator to perform value-added functions to the research enterprise. How would this work? Imagine, for example, creating, securing approval signatures for, and submitting a proposal using electronic media throughout. Then imagine receiving the award, loading institutional databases electronically with terms and conditions of the award, processing expenditure documents, securing on-line approvals for deviations, and submitting computerized invoices and reports. Equally impressive, imagine using computer systems to ensure compliance with agency regulations, implementation of Cost Accounting Standards, institutional requirements, etc. as well as providing agencies with all the institutional level information required on proposals and awards, allowing reviewers to download vitae and biographical sketches, and providing certifications and assurances electronically for all proposals and awards.

These are not processes that are only a gleam in programmers' eyes; in some variation, everything mentioned above is currently either operational or in development at federal agencies and institutions

of higher education. For example, the federal government has adopted a set of standards which defines the data elements which must be a part of an electronic proposal to the government. As currently being developed, institutions will create proposals, upload them electronically and transmit that data set to a federal agency where the same process (in reverse) will allow the agency to review and process the proposal, leading hopefully, to an electronic award utilizing a different federally adopted transaction set. It is apparent that the responsibility to develop and implement such systems will be in sponsored programs offices, with the support of institutional information technology offices.

How, then, does this relate to compliance activities of sponsored programs offices? Essentially, the only limitation on how compliance requirements can be aided by electronic systems lies in the level of creativity of sponsored programs personnel and their computer professionals on staff. A few examples again will suffice. The requirements of Cost Accounting Standard 501 (consistency in proposing costs, accumulating costs, and reporting costs) suggest that there needs to be a process at an institution to ensure that these three activities are closely interconnected. Many institutions, for example, set annual percentage increment pools for types of employees, for fringe benefits, and for inflation in purchasing goods and supplies. In an electronic proposal system, the budget portion of the proposal could have these annual increment percentages programmed into the budget development system. Faculty and administrators could build basic direct cost budgets, and the increment and indirect cost percentages, for example, could be automatically applied. Proposers could override the “standard” increments with adequate justification.

Electronics can be used in another way to provide necessary compliance information on proposals and standard institutional information required by the government. Currently under development is an electronic institutional profile which would provide to the government all the necessary information about an institution and also would include institution generated certifications of compliance with the federal regulations such as compliance with lobbying rules, debarment rules, compliance with environmental and equal employment opportunity standards, and animal and human subjects requirements. An authorized institutional official would update these certifications on an annual basis (as now allowed as an agency option in OMB Circular A-110), and thus institutions would avoid having to submit certifications with individual proposals. Another approach might be to embed certification type questions within the electronic transmittal processes of an institution.

No matter how it is done, research administrators who carefully construct computerized and electronic systems can provide an essential tool to their institutions to help ensure stewardship of external funds. Not only can automated systems include computerized calculation of Facilities and Administrative cost rates, standard increment percentages, and benefit rate calculations tied to individuals or positions, they can also track compliance with Institutional Review Board and Institutional Animal Care and Use Committee reviews, help in monitoring subcontractors, and produce notifications for timely report submissions.

Summary

Clearly, the new century will open with both federal agencies and colleges and universities focused primarily on the electronic creation, processing, and submission of proposals. That, however, is just the beginning; by the end of the first decade of the 21st century, research administration will be significantly different than it is today. The changes that we have seen over the past fifty years will be

dwarfed by the changes in the next dozen years and the successful research administration professional will be one who can adjust to a dramatic new paradigm.

Regardless of the scope and magnitude of the upcoming changes, sponsored programs administrators will meet the challenge while being mindful of Ray Woodrow's admonition that what they do is management for research, not management of research.²⁷

Endnotes

- 1 Prior to the influx of federal funding, some institutions of higher education (primarily large, private universities) had, even before World War II, established offices to manage industrial contracting activities.
- 2 Bureau of the Budget, Executive Office of the President, *The Administration of Government Supported Research at Universities*, March 1966, p. i.
- 3 In fact, in 1958 the Bureau of the Budget issued its Circular A-21: Cost Principles for Educational Institutions, which established the principles for cost reimbursement for those institutions.
- 4 Steinberg, Louis H., *A Study of University Research Administration: Organizational Structure, Function and Effectiveness* (Western Michigan University, August 1973).
- 5 Steinberg, p. 14.
- 6 *Sponsored Research Policy of Colleges and Universities. A Report of the Committee on Institutional Research Policy* (Washington, D.C., American Council on Education, 1954), p. 3.
- 7 Bureau of the Budget, pp.102-112.
- 8 *Science and Engineering Indicators*, 1998 (Arlington, Va., National Science Board, 1988), Appendix Table 5-2, p. A-196.
- 9 Bureau of the Budget, p. ii.
- 10 *Ibid.*, p. 75.
- 11 Bureau of the Budget, p. i.
- 12 *Ibid.*, p. 3.
- 13 *Ibid.*
- 14 *Ibid.*, p. 4.
- 15 Steinberg, p. 19.
- 16 Beasley, Kenneth L., Dingerson, Michael R., Hensley, Oliver D., Hess, Larry G., and Rodman, John A., *The Administration of Sponsored Programs* (San Francisco, Jossey-Bass, Inc., 1982), p. 13.
- 17 Steinberg dissertation.
- 18 *Science and Engineering Indicators*, Appendix Table 5-2, p. A-196.
- 19 Preamble to OMB Circular A-110, July 1, 1976.
- 20 Although this Circular did not apply to private colleges and universities, public colleges and universities could be included in the requirements of the Circular if so determined by the state. Private colleges and universities were, however, subject to the requirements of OMB Circular A-133 (Audits of Institutions of Higher Education and Other Nonprofit Institutions) which was issued on March 14, 1990.
- 21 Preamble to OMB Circular A-128, April 12, 1985.
- 22 Woodrow, Raymond J., *Management for Research in U.S. Universities* (Washington, D.C., National Association of College and University Business Officers, 1978) pp. 103-110
- 23 Woodrow, p. 104.

- 24 *Managing Externally Funded Programs at Colleges and Universities: A Guideline to Good Management Practices* (Washington, D.C.: Council on Governmental Relations, 1989).
- 25 Siegel, Barbara E., "The Federal Demonstration Partnership, Phase III: A Cooperative Venture between Federal Agencies and Participating Institutions," *Academic Medicine*, Vol. 72, No. 5, May 1997, pp. 374-375.
- 26 Private communication between Norris and Youngers and the Atlantic Information Service which will be incorporated in a revised chapter on electronic research administration in their publication entitled *A Guide to Managing Federal Grants for Colleges and Universities* (Washington, D.C.), 1998.
- 27 Woodrow, p.xiii.

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