1981);[7] or is no more than 11% of university research effort[8] (up from the 3.8% estimated in 1981).[9]

But while industrial funding does not have the potential to replace federal funding *as the major source of financing university research*, it *does* have the potential to replace much of what universities have *lost* (and stand to lose) because of decreases in the level of federal funding. From the university perspective, it is this potential that provides the incentive for enhanced university-industry research cooperation. From the industry perspective, there is an increased realization that reversing America's continuing loss of the productivity battle with foreign competitors depends on greater recognition and use of the demonstrated causal connection between advances in technology and greater productivity. Thus it is imperative to build better linkages between the acquisition of new technical knowledge in universities and the application of new knowledge in industry.

This rapprochement is not a completely new phenomenon to a few universities, but even in those institutions the pace has distinctly quickened. To most universities the opportunity for new university-industry relationships brings with it an almost completely new set of problems with which to cope.

II. SCOPE AND APPROACH

This article concentrates on those occasions when an industrial firm and a college or university desire to enter into a cooperative or sponsored research agreement. These agreements usually fit into one of two categories. First, the industrial sponsor may desire to enter into a partnership relationship with the university to carry out a truly collaborative research effort. Second, the firm may contract with the college or university to perform research aimed at a specific goal or end product. Often, of course, the actual arrangements are a mixture (sometimes a *curious* mixture) of these two types of research arrangements: for example, sometimes there may be some "unrestricted" basic research funding mixed in with the other types of funding. In each case, the specifics or details of the agreement become very important. This article will address the document actually spelling out the terms of the research arrangement, or the "research agreement" as it will be referred to herein.

It is also useful to note some issues we will not discuss under the rubric of "research agreements." We will exclude consulting for industry by individual faculty and other university researchers, not a new phenomenon at all. Basic research funding from industry on a gift or "no strings" grant basis also is common in universities and this, too, will not

[7] See NATIONAL SCIENCE FOUNDATION, NSF 81-311, *supra* note 1, at 21.

[8] McDonald, *The Chronicle of Higher Education*, June 30, 1982, at 6, quoting Kenneth A. Smith of the Massachusetts Institute of Technology.

be addressed. Finally, we will exclude from this discussion the many industrial associate arrangements entered into over the years where, in exchange for an annual financial contribution, multiple industrial associates have such privileges as receiving publications, attending seminars, and having industrial problem areas diagnosed by knowledgeable faculty. Such industrial associate arrangements have served as "half-way houses" between outright gifts and grants on the one hand and sponsored research agreements on the other.

That these research agreements vary so much and often involve curious mixtures of collaborative efforts and contracted research, present a certain challenge in meaningfully discussing their characteristics. Should we attempt to develop a more or less standard industrial research agreement, a national "basic agreement" if you prefer, in the manner of standard federal grants or research? Or is there no one "best way" to structure these agreements; is each situation essentially so different as to require customized handling to attain the desired results?

This writer, based on his own experience, leans toward the latter view: each agreement must be written to fit the situation. Although there do inevitably develop, over time, identifiable areas to which one needs to attend in almost every case, every provision must be examined on each occasion, if not actually customized, to assure the proper result. At the same time, certain baseline approaches need to be developed for various provisions, so as not to "re-invent the wheel" for each arrangement. It is these identifiable areas and baseline approaches upon which we will concentrate in this article. Because it is so very important to customize each agreement to fit the situation, we have stifled the temptation to include a collection of *sample* clauses, lest they be regarded as *model* clauses. Nevertheless, we will attempt to discuss the essence of *each* provision.

III. SOME PROBLEM AREAS AND BASIC APPROACHES

This section identifies fifteen issues which recur generally in drafting research agreements and discusses some of the basic approaches which have been followed in addressing them.

A. THE SCOPE OF THE RESEARCH PROJECT.

It is not at all uncommon to find an industrial sponsor and a university researcher who are uncertain about the desired specific outcome of their research arrangement or even about the bounds of the research area. This is often a natural and inevitable result of the definitionally speculative nature of much scientific research and of some engineering endeavors. But just for that reason, it is paramount that the boundaries of the research undertaken be described with as much specificity and precision as the situation permits. Many aspects of the arrangement other than

ample, control over the research project, any right of the industry sponsor to exclusive funding of the specified area of research, and patent or publication rights often turn on the defined scope of the research project. Failure to have a well-defined scope can lead (and has led) to embarrassing and costly disputes over who owns the patent rights to inventions made by the researcher (or the researcher's organization) during the term of the research agreement, but not necessarily as part of it.

B. Nature and Extent of the Sponsor's Commitment to the Project.

Frequently, an industrial sponsor would like to fund a research project for as long as the research seems to progress in an acceptable manner or as long as it fits into the firm's overall research and marketing plans; when the research no longer meets the firm's needs, it would like the right to cease funding the project. If year-to-year funding is compatible with the university's needs, it may be willing to agree that the firm has the right to cease sponsorship at the end of each year. After all, universities have had to live with this mode of operation with most funds received from the federal government for many years.

Often, however, the university's needs will require greater stability in the funding arrangement. Because of the need for new staff or facilities which would not otherwise be required, the university will want an assurance that industry will not "bail out" from a successful ongoing research project and continue the work on its own. Thus, it may be necessary to negotiate a provision by which the industrial sponsor agrees to fund the project, within certain overall limitations, for so long as the research project meets certain clearly defined milestones. Of course, the ability to establish and agree upon such intermediate goals or "gates" depends on the degree of specificity to which the research project, and its intermediate and ultimate goals, lend themselves. Although often difficult to set forth, intermediate "gates" should be identified in the agreement with a provision whereby the sponsor agrees to continue funding the project, at agreed upon levels, as long as the research continues to meet those targets, until either the time or funding negotiated for the total project have expired.

C. Nature and Extent of the University's Undertaking Pursuant to the Agreement.

A university should never make a firm commitment to achieve a specific research result, or to achieve *any* result for a fixed or guaranteed amount of funding. Such a commitment is in conflict with the inherently open-ended nature of scientific research. Guaranteeing results (especially for a set amount of money) is somewhat analogous to asking a physician or a lawyer to guarantee the results of medical treatment or litigation: it can't be done, and it would be unethical to purport to do it.

aversive institutions which have no legal right to place institutional funds at financial risk with speculative research commitments. The consequences for unauthorized expenditures can be severe: the institution may be liable for improper diversion of charitable funds,[10] or it may lose its tax exempt status if it permits the fruits of its operations to inure to the benefit of a private party.[11]

As a result, one of the first provisions that should be written into a university research agreement is a statement that it will be carried out by the university on a "best efforts" basis, with no financial or other contractual penalty for default, except of course the right of the sponsor to withdraw its support. The idea of such a provision may sound obvious to members of an academic community, but it is foreign to many industries, particularly those not commonly dealing with universities. Universities must remember that industrial organizations are typically accustomed to firm performance commitments, fixed prices, and provisions which allow for recoupment of damages in case of default. These types of provisions should be foresworn where the party responsible for performing the research is a nonprofit, tax exempt university.

D. Control Over the Conduct of the Funded Research Program.

Universities traditionally avoid any hint of control by the industrial sponsor over the specific research program being funded once it has been initiated. This resistance goes to the very heart of an academic community's concern over industrial sponsorship. It involves the ubiquitous (albeit not always clearly defined) concept of threats to "academic freedom" and to "scientific inquiry." Most industrial firms that have

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[10] Many jurisdictions, such as California, in recent years have revised the general standard of care applied to a typical "trustee" of a university organized as a non-profit corporation. The trend is to make that standard more like the standard imposed on the director of a general business corporation, as contrasted with the strict liability imposed on the trustee of a true trust. *See*, e.g., Cal. Corp. Code § 5231(c) (Deering 1979); *see also* 1B Ballantine & Sterling, Cal. Corp. Laws § 406.02[5] (4th ed. 1982). The now famous *Sibley Hospital* case also applied this "modern trend" in the hospital setting. *See* Stern v. Lucy Webb Hayes National Training School for Deaconesses and Missionaries, 381 F. Supp. 1003, 1013 (D.D.C. 1974). *Nevertheless*, this should not obscure the fact that, in most jurisdictions, the funds and other assets of non-proprietary universities are, by law, charter, or constitution, dedicated to public or charitable purposes; *see*, e.g., Cal. Corp. Code § 5111 (Deering 1979); 1B Ballantine & Sterling, *supra*, § 406.02[1][a] (4th ed. 1982). In some cases, these assets are impressed with an actual charitable trust. Such funds and assets cannot, therefore, be diverted to private or other purposes without violating the laws, charters, or constitutions under which the universities operate. Even under the liberalized standard of care, university "trustees" could be found guilty of mismanagement for authorizing or permitting such diversions.

[11] *See* I.R.C. § 501(c)(3) (West Supp. 1982) which provides that the exemption from federal income tax allowed by § 501(a) of the Code will apply only to those organizations "no part of the net earnings of which inures to the benefit of any private shareholder or in-

had any significant dealings with universities realize how important this matter is to university researchers and will agree to a "hands off" approach, except for appropriate technical reporting or collaboration.

E. Exclusive Right of the Industrial Sponsor to Fund Research in the Area Involved in the Agreement.

While universities are correct in rejecting attempts by industry to control either the manner in which research is done, or exploration into areas not covered by the agreement, a sponsoring firm may have a legitimate reason for demanding the right to be the exclusive funding source for a project. Where the sponsor is funding research in a fairly well-defined area, with the hope of commercially exploiting the results, it may desire to negotiate certain exclusive rights to use the outcome of that research. For example, the sponsor may request the right to an exclusive license on any patentable inventions which result. In this case it will be important to the sponsor to assure that the results of the work are not "contaminated" with rights vested in others, particularly other industrial or commercial sponsors, but in many cases also including the federal government. In these situations the sponsor will usually insist on an agreement by the university that it will not accept funding from any other source during the course of the funding agreement which could adversely affect its rights to the final result of the research.

The extent of agreement granting exclusive rights to fund a research project will vary depending on the facts of the situation. It may be worded generally to prohibit the university from accepting money during the course of the project which would alter the rights of the industry to that research. Or the provision may contain an absolute prohibition against other sponsorship of the same research project without the original sponsor's concurrence. Occasionally, the parties may prefer to agree to exclude all additional sponsorship except for specifically enumerated parties, as where the parties depend on contributions from the federal government or other noncommercial sources.

F. Extent and Terms of Actual Technical or Scientific Collaboration by the Industry Participants.

The more that the proposed arrangement takes the form of a cooperative research effort, as opposed to contracted research, the more likely it is that questions will arise as to industry's nonfinancial contributions to the project. These contributions should be spelled out as clearly as possible in the agreement to avoid misunderstandings as the project proceeds. The following questions illustrate possible problem areas.

Perhaps some exotic source material (for example, the subject matter of the research) is to be produced or otherwise supplied by the industrial sponsor. When is it to be delivered? In what condition? How will it be transported?

Perhaps fabrication or testing of materials, which can better be done in the industrial setting, is to be performed by the sponsor. Who decides when it is to be done and in what quantity? What limitations are there on the industrial sponsor's obligations to produce, deliver, or test? What if the sponsor fails to provide the materials? Will the sponsor provide additional funds to the university to obtain them elsewhere?

Frequently, industry will provide scientists or technicians to collaborate with the university's researchers. The parties should specify the details of such efforts. What is to be the division of labor between staff? If the industrial researchers are to work on campus with the university researchers, who decides what personnel will be made available, the times they are to be in the campus laboratories, and the number on campus at any one time? It is often best to provide that the university principal investigator has the right to approve which staff will be admitted to university laboratories, as well as their specific schedules, to prevent confusion and unsupervised activities in the labs.

It is terribly important for the parties to agree that the university's normal research and teaching regimen will not be upset. Both faculty and students (particularly graduate students) can be seriously hindered in the pursuit of their normal research and educational activities if adequate care is not taken to prevent disruption. The academic infrastructure involved is often fragile at best, and it is crucial that intrusion of industrially sponsored research does not adversely affect the normal academic environment. More importantly, the industrial sponsor should not be placed in a position to divert student or faculty time and effort to its commercial use (except as the agreement provides). Attention to this problem not only will protect ongoing academic activities, but also will deter potential accusations of improper and illegal diversion of the university's assets.

G. Reporting Requirements.

The matter of reporting requirements should be distinguished from inappropriate attempts by an industrial sponsor to control the actual research project. Here, the tests should be reasonableness of the requirement and the feasibility or practicality of the reporting. Some sponsors may ask for monthly technical progress reports which are really too burdensome for the particular researcher to produce. Others may ask for long, detailed reports which absorb an undue amount of time otherwise better devoted to the research effort. The university researchers, on the other hand, might prefer an annual report only, or if possible, no report at all.

A good compromise is often to provide for a quarterly or semi-annual report consisting of an oral report and interactive discussion, followed by a short written summary or minutes of the meeting. This process tends to furnish the information required with the least amount of administrative

demand on the researcher. In addition, periodic technical interaction is often exceedingly useful to both parties.

Care must also be taken to prevent unrealistic commitments as to financial reporting. The university should not be committed to monthly, or even quarterly, financial reports by, for example, the tenth of the month, if the university financial reporting system cannot deliver that result without special heroic efforts. Often university systems are not set up to report on the financial condition of research projects until approximately the twenty-fifth of the following month. Because most university financial reporting on sponsored research is associated with reporting on federally-funded projects, it is probably impractical to agree with an industrial sponsor to furnish different or earlier reports. (Of course, the industrial sponsor may be willing to pay for the additional expense. Even then, it may be an unwise practice to begin unless the university is prepared similarly to customize reporting requirements for other sponsors.)

II. Funding.

The type and frequency of appropriate funding will vary considerably with the circumstances and the usual practices of the particular university involved. If a university is accustomed to working on letters of credit or other forms of advance funding, it should by all means request advance funding in such amounts and frequency as will assure uninterrupted work on the research project. This type of arrangement works best if a detailed schedule of funding, by date and by amount, is set forth in the research agreement itself. Of course, arrangements can be made whereby the university makes periodic estimates and requests for funding. But this type of procedure introduces an element of uncertainty into the funding arrangement by requiring industry approval for each request. And this approach inevitably requires more administrative time and effort on the part of all concerned. It is more convenient to use a schedule agreed upon in advance if the necessary flow of funds can be reasonably estimated in advance of the project.

One variety of funding arrangement deserves special attention because it contemplates two different types of advance funding to achieve vital complementary goals. The first kind of funding covers the actual costs or expenditures (both direct and indirect) estimated to be incurred in performing the specified work. The other portion of funding is in the nature of a grant for use by the university researcher in an unrestricted way (but usually within a specified area of research). For example, an industrial sponsor may agree to provide funds in the amount of $250,000 for each of three years on the following terms: on or before the beginning of each year the sponsor is to pay $100,000 to the university, $50,00 as a grant for the use of researcher X on an unrestricted basis and $50,000 as an advance to be used for the first quarter of the specific research project

sponsored under the agreement. Fifty thousand dollars are then to be advanced on or before the first of each of the three following quarters, in each year, all to be used on the sponsored research project. This research agreement helps to fulfill two research funding needs: funding the specific project, and providing money which is essentially unrestricted and can be used by the researcher for basic or other research of his or her choice.

1. Competing Interests in the Use of Research Results.

This topic brings us to an area identified by many people responsible for university research as the most difficult in working out research arrangements between universities and industry.

Freedom to publish (often confused with the general concept of academic freedom) is a deep-seated matter of principle in academe, which has at its base a curious mixture of a need to be able to publish and a sort of academic "machismo" that sometimes defies description or categorization. The need to publish is based both on the concept of the free exchange of ideas and knowledge, which is so essential to scientific inquiry, *and* on the fact that universities are usually tax exempt institutions which must protect that status in order to exist.[12] In any event, freedom to publish is a—nay, *the*—governing fact of life at many, if not most, research universities. It cannot, and should not, be bargained away for funding, industrial or otherwise.

This premise, of course, brings the university's principles into basic conflict with a valid concern of many industrial and commercial organizations. Although some industrial firms obtain and "sit on" trade secrets or other proprietary information (usually perceived by academe and the public as a "social bad"), many more organizations seek to obtain and use such information as a necessary part of the production or delivery of their goods or services to the public (a "social good"). The trade secret is often the vital link which provides the firm with its commercial niche or

[12] The importance of the freedom to publish, and to do so promptly, to an organization exempt under § 501(c)(3) of the Internal Revenue Code on the basis that it performs scientific research is discussed in detail by Kertz in *Tax Exempt Organizations and Commercially Sponsored Scientific Research*, 9 J. Coll. & U. L. 69, 72-76 (1982-1983). *See also* Treas. Reg. § 1.501(c)(3)-1(d)(5) (1976), and Rev. Rul. 296, 1976-2 C.B. 142-143, which addresses the question of when commercially sponsored research performed by a § 501(c)(3) tax-exempt organization is considered to be carried on "in the public interest" and thus comes within the exemption and when, on the other hand, such research is regarded as generating unrelated business income. The right to publish freely and promptly helps establish the necessary substantial relationship between research and furtherance of the exempt purpose. Publications become particularly important where the university is performing for industry "development" or other work going beyond what the I.R.S. will accept as "research" that falls under the exclusion from unrelated business income which colleges, universities and hospitals now enjoy under § 512(b)(8) of the Code. See the discussion on this point in Kertz, *supra*, at 76-84, particularly note 41 therein.

competitive advantage, allowing it to prosper or at least survive. How can these two interests be resolved in the research agreement?

This reconciliation is often difficult and sometimes impossible, and this problem probably leads to the majority of cases where industry and the universities just cannot arrive at a research agreement. Few universities today will agree to keep the results of industrially sponsored research confidential. If confidentiality of the results of research is really important to the industrial sponsor, that firm would be well advised to have the research performed somewhere other than an academic institution.

Nevertheless, there are a few bright lights at the end of this tunnel. From industry's perspective, the anticipated results of the research are often much more scientifically or technically valuable to the industrial organization, than is the keeping of such results confidential. This is particularly true in the case of the basic, generic research which has tended to foster multi-sponsored arrangements. It is also true in situations where the particular technology is extremely dynamic and obsolescence may come quickly; in these cases it is much more important to be the *first* firm with the technology, even with a short lead time, than the *only* one with it. Increasing numbers of high technology organizations seem to be coming to this conclusion.

Companies are very likely drawn to this conclusion by recognizing that the *right* to publish is not the same as the *obligation* to publish immediately, and university researchers often *do* delay publications for various reasons legitimate to them. Furthermore, the process of scientific or technical publication itself usually takes several months. Thus, if the industrial organization is receiving progress reports on the research and has staff on the scene, it has a definite advantage over others not privy to the research. And, if the technology in that area is sufficiently dynamic, that advantage may be sufficient for the firm's needs.

A recent study[1] has shed some interesting light on how industry and university research personnel currently view the decision to delay publication and how important the *reason* for wanting such an agreement can be. That study indicated that eighty-two percent of the university respondents believed that universities *should* agree with industrial sponsors to withhold research results from publication *during the time necessary for the university or industry to obtain patent protection*. Conversely, eighty-seven percent of the university respondents said that

[1] This study was conducted in the Spring of 1982 by the author as a portion of the research for his dissertation as part of the requirements for a Ph.D. degree in Management. Eighty persons in industry at the level of vice president, director of research, or above, were queried, as were seventy-eight persons of roughly comparable status within the forty-eight universities which constitute the U.S. members of the Association of American Universities (AAU). The results of this study are included in the dissertation entitled *The Need for and the Impediments to Improved and Novel University-Industry Research Relationships*, to be published in early 1983 by University Microfilms International, Ann Arbor, Michigan.

universities should *not* agree to withhold research results from publication *for the firm's competitive reasons other than patent protection*. Thus, there seems to have developed within the academic community a rather clear cut distinction between delaying publication for the time needed to obtain patent protection and agreeing to delay publications for other reasons. This distinction seems to be reflected in most of the recent research agreements which we have examined.

The contractual provisions defining the agreement to delay publications until patent protection is obtained vary considerably. Some provisions are quite simple and very general: the parties merely agree to keep confidential and not publish any results of the research until adequate steps have been taken to protect the patent rights of each. Some provisions are more elaborate and require a pre-publication notice to be sent to the other party, or establish a specific time period during which publication will be withheld, so that the party may file patent applications. These periods typically range from thirty to ninety days, although some are extended up to six months.

Otherwise, the agreements generally do not give to the industrial sponsor the right to approve, or even to review, publications prior to submission for publication. It is not uncommon, however, for the parties to agree that research submitted for publication will simultaneously be submitted to the sponsor. In these cases, the firm can take comfort that there is a considerable time period, typically about four months, between submission for publication and actual publication. Most university researchers are likely to be receptive to legitimate comments or criticisms from the sponsor during that time. Presumably, however, changes would not be made merely because the report places the sponsor or its products in an unfavorable light or otherwise decreases the sponsor's competitive edge. In the last analysis, that decision must be left to the individual researcher, who must remain free from any contractual commitment limiting the exercise of judgment as to which comments or criticisms of the sponsor should be reflected in the final publication.

J. Receipt of Proprietary Information From Industrial Sponsor.

One matter that is often confused with the university's need to publish is the acceptance of proprietary (confidential or trade secret) information from the sponsor which is necessary to the performance of the research, with an accompanying explicit agreement that the sponsor's information will be kept confidential. This is an entirely different matter from agreeing to delay or to keep confidential the results of the research project, and therefore, the overriding principles of publishing research do not apply. Nevertheless, there are practical problems in agreeing to protect a sponsor's confidential information in the academic environment. An academic community, with its principle and practice of free exchange of ideas, is by its nature simply a difficult place in which to promote any confidentiality.

There also need to be clear-cut contractual understandings regarding the university's right to disseminate the same or similar information if received without restriction from sources other than the sponsor. The university needs to be protected from liability or criticism if otherwise confidential sponsor information gets into the public domain without university fault.

With the proper orientation of the university research team and proper drafting of the research agreement, these matters can be dealt with to the satisfaction of both parties. Nevertheless, in the final analysis, each university must decide whether it wants to subject itself to the internal controls necessary to receive and protect sponsor-furnished proprietary information. The university and its faculty must also decide whether they are willing to accept the adverse impact (albeit often relatively slight) on the free interchange of information among faculty and students which could come from protecting the sponsor's information.

K. Patent Rights.

Patent rights involve another important, highly publicized area of dispute between industry and universities. However, there are several indications that contention over patent rights is not as serious a problem as it may have been a few years ago. For whatever combination of reasons, patent applications filed by, and patents issued to, United States inventors have declined markedly over the past several years, both in absolute numbers and relative to foreign inventors.[14] In the opinion of Professor Raymond Vernon of Harvard, the reasons for this decline are that: "With a speeding up in the technological change, some companies prefer to keep their innovations to themselves rather than publish their results. Moreover, the shift in innovation from creating novel products to developing cost-reducing products and processes also tends to reduce the innovator's willingness to patent."[15]

There appears to be growing recognition that an exclusive license to a patented invention, title to which is retained by the university, will accomplish almost everything for the industrial sponsor that outright title to the patent would accomplish. Exclusive commercial use for several years, in some cases for the life of the patent (see discussion below), usually will be sufficient for industry to accomplish its purpose (even for tax purposes[16]). Most universities are willing to grant an exclusive

[14] See Commissioner of Patents and Trademarks, Annual Report, Fiscal Year 1981 (1982) at [illegible].

[15] Vernon, Come Are the Cash Cows of Yesteryear?, Harv. Bus. Rev., Nov.-Dec., 1980, at 153.

[16] For example, in order for a sale or exchange of a patent to constitute a sale or exchange of a capital asset held for more than one year, all that is necessary is a "transfer . . . of property consisting of all substantial rights to a patent, or an undivided interest therein which includes a part of all such rights." I.R.C. § 1235(a) (1976). See Treas. Reg. § 1.1235-

license in the appropriate case and with the proper march-in rights. ("March-in rights" are rights in the licensor, typically to reclaim from the licensee all or certain rights in the invention or to require mandatory sublicensing by the licensee if the latter does not take the steps necessary to develop and market the invention in a timely fashion.) Thus, while patent rights are an important element in the negotiation of any university-industry research agreement, their resolution is less troublesome than once perceived.

Often the first point of contention between the parties is whether title to patents on inventions made in the course of the research will vest in the industrial sponsor or in the university. It has been our experience that an exclusive license, properly drafted, will satisfy most industrial sponsors. However, some industrial organizations will not accept anything less than title. In those cases, unless the university will agree to assign title to the sponsor, agreement may not be possible. This problem has proven to be the exception rather than the rule.

Most universities, given their druthers, would prefer to grant non-exclusive licenses, as opposed to exclusive licenses or patents, because they are more in keeping with the academic concept of free and broad dissemination of newly acquired knowledge. Universities often have specific written policies declaring the non-exclusive license to be the preferred way to license patents.

Particularly in the case of generic research sponsored on a multi-sponsor or consortium basis, the industrial sponsor sometimes will agree in advance to non-exclusive licenses. The decision to accept a non-exclusive license often will depend on the sponsor's competitive position in its field (if dominant or large enough, it may feel able to forego a preferential patent position), the size of its investment in the project, or the importance of the results of the particular research to the future of the sponsor.

The goal of granting free access to innovations created by universities is certainly laudatory. However, as the federal government learned over a period of many years, if a firm cannot obtain some measure of protection by preferential licensing, it is not likely to spend significant amounts of money to develop and market the type of innovations which typically result from university research. Thus, most universities must be prepared to grant exclusive licenses to the industrial sponsor in appropriate cases if they are to deal effectively with such sponsors.

If the parties agree that an exclusive license is appropriate, the following issues arise. Should the license be for a term of years, or for the life of the patent? What rights will the university reserve so that it can use the innovation for research, education, and the performance of other contracts? What type of reporting on inventions will be required, and under what circumstances must such reports be made? Who will file the necessary patent applications and pay for their costs? What developmental or performance requirements must be met by the industrial licensee in

order to retain the license, and what are the companion "march-in" rights of the university if the licensee fails to comply with the license agreements? What license fees or royalties must be paid by the licensee and under what arrangement? How will the parties handle joint inventions? Who will control, and pay for, the prosecution of patent or license infringers? Should the license be restricted to one "field of use," leaving the university the right to license the invention for other uses?

Detailed analyses of issues such as these, relating to specific patent rights to be granted to the industrial sponsor in the event patentable innovations do arise under the research agreement, are beyond the scope of this article. Patent counsel should always be involved in formulating agreements involving patent rights, terms of art and standard practices are frequently involved in this area which may be applied incorrectly by a lay person or even by general legal counsel.

Some universities prefer to delay a decision as to the type of license to be granted until a patentable invention has actually been made. In this way, it is felt that any specific pertinent circumstances can be taken into consideration before that decision is made.[17] Sometimes agreement with the sponsor to delay a decision may be possible, but sponsors understandably prefer to settle these issues in advance.

Agreements with industrial sponsors as to the patent rights they will have in future inventions vary in two major respects from most patent licenses otherwise granted by universities. First, most patent licenses otherwise granted by universities cover inventions made under contracts with or grants from the federal government. Therefore, they come with all the strings which may be attached to patent rights gained under such

2(b) I.D. 6852 (1964 2 C.B. 287, 289-90), which defines what grants the I.R.S. believes do not meet the test of transferring "all substantial rights to a patent." Those not meeting the test, according to the I.R.S., include a grant which: (a) is limited geographically within the country of issue; or (b) is limited in duration to a period of less than the remaining life of the patent; or (c) grants rights, in fields of use within trades or industries, which are less than all the rights covered by the patent, where the reserved rights have value at the time of the grant; or (d) covers less than all the claims or inventions covered by the patent that exist and have value at the time of the grant. Treas. Reg. § 1.1235-2(b) also defines the rights which the I.R.S. believes to be "insubstantial" for the purposes of § 1235 and which thus may be retained by the transferor without prejudicing the capital asset nature of the grant. The permissible retentions include: (a) retention of legal title for the purpose of securing performance or payment by the transferee in a transaction involving transfer of an exclusive license to manufacture, use and sell for the life of the patent; and (b) retention of such rights as are not inconsistent with the passage of ownership, such as the retention of a security interest (as in a vendor's lien) or a reservation in the nature of a condition subsequent (such as a provision for forfeiture for nonperformance). Certain other examples of rights which may or may not be substantial also are given in the regulation. Whether these latter rights may be retained depends on the circumstances of the whole transaction. The regulation makes clear that retention of a right to terminate at will is retention of a substantial right for the purposes of § 1235.

[17] For a discussion of the distinction between granting of exclusive patent licenses on inventions already made and granting of such exclusive licenses on all inventions which may be made in the future under a sponsored research project, see the text of the so-called Pajaro Dunes statement set forth *infra* at 9 [illegible] & U.L. [illegible] (1982).

contracts or grants. Under the new law governing inventions made under contracts or grants funded by the federal government,[18] several such requirements exist as to inventions to which the university elects to take title. These include, among others: (a) a prohibition (unless the government otherwise agrees) against the granting of exclusive licenses to persons other than small business firms for terms greater than the earlier of five years from first commercial sale or use, or eight years from the date of exclusive licensing (excepting certain years needed for pre-market regulatory clearance);[19] (b) certain "march-in" rights reserved to, and which can be exercised directly by, the federal government in the case of exclusive licenses issed by a university;[20] and (c) unless waived by the government, a requirement that an exclusive license not be granted unless the licensee agrees that any products embodying the invention or produced through the use of the invention will be manufactured substantially in the United States.[21] Because these requirements attach only if federal funding or support is involved, agreements often specify that there will be no federal support which might detract from the industrial sponsor's rights.

The second major way in which provisions in research agreements regarding patent rights vary from the usual patent license granted by the university is that they are all agreements made in advance of the innovation. It is clearly more difficult to negotiate appropriate provisions to cover future inventions than to negotiate patent license provisions for an existing invention. That is a prime reason why some universities defer a determination as to whether any license should be exclusive or non-exclusive until after the fact of invention. About the most that can be done in pre-invention situations is to negotiate as flexible and as comprehensive a provision as is acceptable to both parties. Such a provision can range from a simple agreement to negotiate in good faith any necessary licensing arrangement after the fact of the invention to a relatively complete license agreement, fully negotiated except for a description of the patent or patents involved. The latter is normally attached to the research agreement to be executed by the parties if and when patentable innovations arise under the research agreement. This writer personally favors the latter approach, to the extent feasible, because of his penchant for certainty and for settling things while one still has some bargaining power.

L. THE LICENSING OF "KNOW-HOW."

The licensing of unpatentable or unpatented "know-how" is not usually a major issue in the academic context. Even within this context of

[18] Act of Dec. 12, 1980, § 6(a), Pub. L. No. 96-517, 94 Stat. 3019 (1980) (codified at 35 U.S.C. §§ 200-211 (1976 & Supp. IV 1980).

[19] 35 U.S.C., § 202(c)(7)(B) (1976 & Supp. IV 1980).

[20] *Id.* at § 203.

[21] *Id.* at § 204.

free publication there remains a considerable amount of technical and procedural research detail which never reaches publication, not because of contractual or other external constraints, but because of the nature of the information, or because the researcher simply does not get around to publishing it.

In the typical *after-the-fact* patent license, any need for related "know-how" by the licensee can be (and usually is) filled by making the researcher available for individual consultation. In the *before-the-fact* situation typically involved in research agreement negotiations, the university is sometimes faced with a demand by the industrial sponsor for a license, to use a term of art, to "know-how." Such a "know-how" license for related technology, particularly on a non-exclusive basis, would appear to present no conceptual or practical problem for the university, provided the researcher processing the "know-how" is agreeable and the license is subject to the university's and researcher's rights to publish freely. But questions might arise were the sponsor to wish an "exclusive" license for all unpublished data. That issue can (and has) been resolved by providing clear understanding that the sponsor's "exclusive" license can be effectively negated by publication by the university or researcher. By such an agreement, the industrial sponsor still gains exclusive access to the data unless the researcher goes to the time and trouble of publishing it. In addition, the agreement raises an effective bar to any competitor's access to the unpublished data.

M. Indemnification and Hold Harmless Agreements.

Fairly frequently, an industrial sponsor will ask the university to indemnify the sponsor for, and hold it harmless against, any and all claims, costs, suits, and the like, arising out of the performance of the research work. Often these proposed indemnity agreements are unlimited in scope; they ask for indemnity and holding harmless without regard to the nature of the injury, damage or loss, and more importantly, without regard to who is at fault. These broad indemnities should be, and usually are, rejected out of hand. They are over-reaching and unfair, and would subject a university to completely unknown and unquantified exposures and, quite possibly, to catastrophic loss.

Whether the university should agree to any sort of indemnification running to the industrial sponsor, and to what extent it should do so, will depend upon several factors. These include: (1) whether the institution is public or private, (2) its attendant authority to enter into such agreements under the law which is applied to the institution, and (3) the risk assumption and management philosophy of the particular institution involved, including the nature and extent of its insurance coverage.

In certain cases it may be appropriate for the institution to arrange a limited indemnity and hold harmless agreement, running to the sponsor, for injuries, damage or loss arising out of the actual performance of the research agreement. However, in such a case, the exposure should almost always be limited to, for example, the "acts or omissions of . . ." or, preferably, the "negligence or other fault of . . ." the "officers, agents and employees of" the university. Such an indemnity agreement at least limits the scope of liability to something approximating that normally covered by general liability insurance; often the type of limited indemnity described comes within specific "contractually assumed" liability coverage provided by the institution's insurance carrier. Where the industrial sponsor will actually be collaborating in the research, every effort should be made to obtain from the sponsor a similar indemnity and hold harmless agreement covering the sponsor's officers, agents and employees.

Some institutions, for legal or other reasons, may not be able to or may not wish to agree to any indemnities at all. Some may insist on a release by the industrial sponsor of any liability for any kind of damage suffered by the sponsor (and perhaps by others). Others may go further and insist on a unilateral indemnity and hold harmless agreement running from the sponsor to the university. And other institutions may expressly disclaim *any* warranties, express or implied, as to the conduct of the research project or its findings, or as to the accuracy of the results or their utility, merchantability, or fitness for any purpose. Whether and to what extent the university can extract such a release or indemnity and hold harmless agreement from the sponsor, or sustain such a disclaimer, will be largely a function of negotiation and of the relative bargaining positions of the parties.

In any event, every institution should be alert for one particular situation even if it agrees to some sort of indemnity or hold harmless provision covering the actual performance of the research itself. In the case of *any inventions licensed to the sponsor* as a result of the research, the burden should be squarely placed on the sponsor to indemnify and hold harmless the university (and its trustees, officers, agents, and employees) from any liability arising out of the manufacture, use, or sale of products covered by the license(s) and suffered by the sponsor or by users or purchasers of such products. This situation, of course, involves *product liability*, a field in which the industrial sponsor who is commercially exploiting the research is in a position far superior to the university's to protect against, and be financially responsible for, such liability. The university should not permit itself to be placed in the position of having to assume this burden in place of the sponsor.

N. Use of University's Name.

Another important consideration in an industrial agreement will be a clear contractual understanding concerning any limitations on use of the name, trademark, logo, or other identifying marks of the university, and of the names of researchers, students, or staff, for advertising or promotional purposes. Universities generally are loath to permit industrial organizations to profit financially by trading on their names or reputa-

tions. Provisions in the contract can prohibit this, yet still provide for exceptions to be made with university approval.

C. Potential Conflicts of Interest on the Part of the University Researchers

For the most part, problems of potential conflicts of interest are internal to the university and exist between the university and its faculty. But such conflicts can and do often impede the making of research agreements between universities and industrial sponsors. For example, one or more of the faculty researchers involved in a particular project may have an equity interest in the potential industrial sponsor, or an ongoing consulting arrangement with it, which may be seen by the university or its faculty as constituting an actual or potential conflict of interest. That situation, at one extreme, could result in a research agreement not being entered into between the university and the industrial organization for that particular research. At the other extreme, the researcher instead might relinquish his or her interest in or relationship with the company.

Occasionally, concern over an actual or possible conflict of interest will make it necessary to negotiate into the research agreement itself a provision whereby the industrial sponsor agrees that no faculty member, staff member (and perhaps student) of the university has or will have any interest in, or will participate as an officer, director or consultant in or of, the organization during the course of the agreement. It might be provided further, that failure to abide by this agreement could result in cancellation of the agreement by the university and forfeiture by the sponsor of any further rights to research results or patents. It should be kept in mind that on occasion individual consulting by faculty or staff members is a useful inducement or supplement to the research agreement, as discussed with regard to the licensing of "know-how." It is important to distinguish those situations from the situation where a continuing consulting arrangement with the sponsor is really just a convenient substitute for an equity-holding position in the company.

IV. Conclusion

This article has sought to address some of the more frequent and important problems encountered in negotiating and drafting university-industry research agreements, and to demonstrate various ways in which these problems or issues can be approached and resolved. In many respects, we who are negotiating and drafting these agreements for universities are still in the "birthing" stage of our efforts, in a very dynamic field at that. What were important issues yesterday have become, in some cases, relatively unimportant today; today's burning issues may be tomorrow's cold ashes. And so we may expect that new and creative solutions will continue to be needed to cope with continuing change.

PAJARO DUNES CONFERENCE
Draft Statement*

Preamble

Research of the past several decades, through enlightened public support, has profoundly advanced the understanding of life processes. A new biotechnology of extraordinary promise has emerged. While much of great importance remains to be learned at the most fundamental level about living organisms, applications of present knowledge can be foreseen that are likely to be of far-reaching benefit to people everywhere. These useful applications may well improve health, enhance food and energy supplies, improve the quality of the environment, and reduce the cost of many industrial processes and products.

With such beneficial possibilities at least dimly foreseeable, it becomes a matter of urgent concern to take constructive steps toward their fulfillment. Most of the basic research which made these applications possible has been done in universities in the United States, mainly with federal government funding. The development of these findings into useful processes and products is already vigorously underway in American industry. The chain of progress from basic research to useful applications necessarily involves universities and industry. For the promise to be fulfilled, all links in the chain must be strong.

The translation from opportunity to reality is not simple or easy: Serious problems are involved. These problems center on the preservation of the independence and integrity of the university and its faculty, both faced with unprecedented financial pressures and complex commercial relationships. Universities are a repository of public trust, and, in many cases, of public funds as well, and they have an obligation to the public as well as to their students and faculty to ensure that they remain devoted to their primary goals of education and research, and that their resources be properly used in their pursuit of these goals.

Therefore, leaders from five of the universities that have engaged heavily over many years in research in the life sciences met to explore problems and clarify the considerations essential to wise policy-making

* From a Biotechnology Conference held at Pajaro Dunes, California, March 25-27, 1982. The presidents of Stanford University, the California Institute of Technology, the University of California, Harvard University, and Massachusetts Institute of Technology convened the meeting. The 35 invited participants included university presidents, administrators, faculty scientists, and industry representatives. Permission to publish granted by Robert M. Rosenzweig, Vice President for Public Affairs, Stanford University.

in this area. Each university invited members of its own faculty and people from the business community to attend as discussants and resources. These considerations must be viewed from the perspective of individual scientists, universities and institutions, industry large and small, and the general well being of people everywhere who can someday benefit from the uses of biotechnology. The social consequences of the technologies are an integral part of research in this field.

There are several strong motivations for academic institutions and their faculties to seek industry support for reseach. First, there is a genuine interest in facilitating the transfer of technology—from discovery to use—to contribute to the health and productivity of society; second, there is interest in ongoing dialogue between academia and industry which could improve the level of applied science by close association with industry applications; and, third, academic institutions and their faculty members are feeling particularly hard-pressed financially and see such cooperation with industry as a way of compensating for a small but important part of the support lost from federal sources.

Although biotechnology is at the center of today's news, we have considered it appropriate to discuss a broader range of university-industry relationships without regard to subject area.

From industry's point of view, a competitive position is critical. Each high-technology company seeks to develop the "best technology" and to use it productively. The development by a business of a cooperative research relationship with a university is likely to be based on the presumption that "best technology" can most readily be created by "best people," access to whom is one objective for the business which finances the program. As long as the conditions which surround access to a university's "best people" are not too onerous, business will continue to make new agreements with universities to enhance their opportunities to achieve competitive advantages.

But the appropriate development of new opportunities in academic-industrial relations presents universities with a host of problems. The most important of these is the potential distortion such relationships may cause to academic objectives. While this issue may vary in degree from one academic institution to another, it is shared by most research-based universities and institutes. If not carefully managed, these patterns of affiliations among university faculty, universities and industrial firms, beneficial though they may be to the transfer of technology, may lead to serious difficulties.

The purpose of the meeting was to contribute usefully to a more fruitful process of policy-making—but not to make policy. This responsibility rests with the individual institutions. The focus of the conference was to define the areas of difficulty or potential conflict and to develop suggestions for guiding the growth of industry-university cooperation in research. It has long been felt that university administrators, faculty and industry leaders have not been communicating enough about the problems arising within the universities in connection with the commercialization of basic research. Equally important, the problems and objectives of industry have been often ignored. As a result, different institutions have been engaged in ad hoc policy formulation, without the benefit of sharing their experience and discussing their common problems.

The overriding concern of the participants was to explore effective ways to satisfy the university community and the public that research agreements and other arrangements with industry be so constructed as not to promote a secrecy that will harm the progress of science; impair the educational experience of students and postdoctoral fellows; diminish the role of the university as a credible and impartial resource; interfere with the choice by faculty members of the scientific questions they pursue, or divert the energies of faculty members and the resources of the university from primary educational and research missions.

RELATIONSHIPS BETWEEN UNIVERSITIES AND INDUSTRY

Research Agreements

It is important that universities and industries maintain basic academic values in their research agreements. Agreements should be constructed, for example, in ways that do not promote a secrecy that will harm the progress of science, impair the education of students, interfere with the choice by faculty members of the scientific questions or lines of inquiry they pursue, or divert the energies of faculty members from their primary obligations to teaching and research.

Universities have a responsibility not only to maintain these values but also to satisfy faculty, students and the general public that they are being maintained. One way of accomplishing this result might be to make public the relevant provisions of research contracts with industry. Another method may be to allow a faculty committee or some other competent body to examine all research contracts with industry and assure that their terms are consistent with essential academic values. Reasonable people may differ on the choice of methods to be used, and we propose no single solution. What is essential is that each university establish some effective method.

The traditions of open research and prompt transmission of research results should govern all university research, including research sponsored by industry. Those traditions require that universities encourage open communication about research in progress and research results. However, as discussed below, it is appropriate for institutions to file for patent coverage for inventions and discoveries that result from university research. This action may require brief delays in publication or other public disclosure.

Receipt of proprietary information from a sponsor may occasionally be desirable to facilitate the research. Such situations must be handled on

a case-by-case basis in a manner which neither violates the principle stated above nor interferes with the educational process. Any other restrictions on control of information disclosure by institutions are not appropriate as general policy.

PATENT LICENSING

Patents and patent licensing provide valuable incentives to facilitate the process of translating scientific discoveries into useful processes and products. By protecting the rights of the inventor, patents also encourage inventors and institutions to make public their discoveries, thus promoting the progress of science and technology. These advantages are fully applicable to universities, which need an incentive to identify potentially useful discoveries and to seek companies that have the resources and capabilities to bring these ideas to the marketplace. The federal government has recognized these advantages by amending the law to allow universities to own and license patents on discoveries made in the course of research financed by government grants and contracts.

Universities are now developing more effective programs to identify and patent potentially useful discoveries and to license them to interested firms. With few exceptions, such programs have not resulted in significant financial gains to universities though greater gains may come in the future. However, regardless of the uncertainty of the economic return, as recipients of public funds, universities have a responsibility to initiate and maintain effective patent and patent-licensing programs to encourage technology transfer.

It is important that universities administer patent programs in a manner that conforms to the public interest and to the universities' primary commitment to teaching and research. One important question is whether universities should grant exclusive or non-exclusive licenses. Some people fear that allowing a single firm the sole right to develop a patent will necessarily remove competition, slow the development of the patent or even prevent development altogether. This fear is exaggerated. Although, in some cases, multiple licenses will undoubtedly speed development, in other cases, exclusive rights are essential if development is to take place since no firm will expend large sums for development that will primarily benefit others.

Thus, universities should be able to negotiate exclusive licenses provided that exclusivity seems important to allow prompt, vigorous development of the patent to occur. The desirability of exclusivity in certain cases is recognized under current federal law. When exclusivity is allowed, however, it should be permitted for only the interval necessary to encourage the desired development. In addition, the university should insist upon a requirement of due diligence on the part of the licensee in developing and using the patent. In exercising these responsibilities, universities should seek to insure that their patents are vigorously developed—not only to promote the public interest but also to further the universities' rights to royalty income.

While the foregoing policies seem acceptable for licensing patents on discoveries already made, greater difficulties arise in corporate research agreements where the sponsor requests the right to exclusive licenses on all discoveries made a result of the research funded by the company. Some of us believe that such exclusive rights are an appropriate *quid pro quo* for the funds provided for research. Others believe that the university should be willing to agree to provide instead non-exclusive royalty-free licenses to the sponsor, but should not give up its right to examine the appropriateness of exclusivity for each invention on a case-by-case basis. This question needs to be addressed by universities on a continuing basis in light of their experience.

It is important that universities not influence the nature of the research proposed by professors, postdoctoral fellows, or students by pressing them to do work of potential commercial importance or to become involved in other commercial activities. Professors may choose to delay publication of research findings for a brief period to permit the timely filing of patent applications, but, absent a contractual obligation, universities should not try to prevent faculty members from publishing or disclosing their research findings to preserve the universities' patent rights.

Universities should not be improperly influenced in choosing a licensee by the fact that a faculty member, or the university itself, is a substantial stockholder or has other significant ties with a particular company.

Licensing agreements between a university and a company are intended to accomplish the transfer of technology in an effective way. In those rare instances where a faculty member or the university has a major financial interest in a company seeking such an agreement, and where the technology to be licensed has been, in whole or in part, developed by the faculty member, licensing should ordinarily be on a non-exclusive basis. Exceptions might arise if the transfer of technology is best accomplished through an exclusive arrangement for a limited period, as, for example, in the case of companies possessing unique skills necessary to such transfer on a timely basis.

THE UNIVERSITY AND ITS FACULTY

University professors have long associated with companies through consulting and other types of relationships. Such interaction can have significant advantage to the univeristy, to the faculty member, to the company, and to the public. In many fields, faculty involvement with the commercial world provides valuable material for teaching and reserach, career opportunities for students and support for institutional activities.

Notwithstanding these benefits, professors' relationships with com-

mercial firms should not be allowed to interfere with their overriding obligation to the university to fulfill their primary responsibilities of teaching and research.

In recent years, the problems of achieving this goal have assumed greater urgency by virtue of the growing tendency, especially in the biotechnology field, for professors to own significant blocks of stock in commercial enterprises, to assist in the formation of such enterprises, or even to assume substantial executive responsibilities. Conflicts of interest may arise through combinations of public funding, private consulting, and equity holding in companies engaged in activities in a faculty member's area of research. These developments underscore the need for universities to consider the rules and procedures needed to insure that faculty members fulfill their responsibilities to teaching and research, and to avoid conflicts of interest.

At times, the research or entrepreneurial efforts of a faculty member may have the potential materially to affect the economic condition of a company. (In such cases, the faculty member is often a substantial stockholder in the firm.) Under these conditions, investment by the professor's own university in the firm gives the institution a financial stake in the activities of its faculty member. This situation may cause others to believe that the university encourages entrepreneurial activities by its faculty. Moreover, it may cause, or appear to cause, the university to extend preferential treatment to the professor, for example, in such matters as promotion, space, or teaching loads and thus undermine the morale and academic integrity of the institution. Hence, it is not advisable for universities to make such investments unless they are convinced that there are sufficient safeguards to avoid adverse effects on the morale of the institution or on the academic relationship between the university, its faculty, and its students.

Many approaches have been used by different universities to address these problems. We make no effort to specify the proper rules and procedures to be used for this purpose. The development of these rules is a matter internal to each university and extends to all faculty members—scientists and nonscientists alike. Hence, this conference does not provide a proper forum in which to resolve such issues. Different rules and procedures may well be appropriate to suit the special circumstances and traditions of different institutions.

Although we see no single "right" policy, we do believe that each university should address the problem vigorously and make efforts to publicize widely and effectively the rules and procedures it adopts to avoid compromising the quality of its teaching and research. Our institutions are committed to such an undertaking.

We also feel that faculty members have an obligation not only to abide by the prevailing rules but to make these resrictions known to the companies with which they have a relationship.

Finally, we suggest that firms ask for copies of applicable rules in

hiring university consultants and act in conformity with these regulations.

We do not view this summary statement as the end of the process of deliberation on these important issues. Rather, we offer it as a contribution to further consideration in meetings of other groups and in many individual institutions. We emphasize again that what we have produced is not policy, but an agenda of issues that may be a useful framework for the development of policy.