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ABSTRACT

The problem of transferring university "technology" to industry must be addressed in highly specific terms if satisfactory and conclusive results are to be expected. It is the general purpose of this conference report to identify major obstacles and to explore successful means for reducing or eliminating them. The conference was planned with the following objectives in mind: (1) to promote an increased interest among university administrators in the technology potential of their respective institutions; (2) to develop a more acute awareness of the need for more effective management of university technology resources; (3) to assemble university representatives with considerable experiences and expertise in the management of faculty discoveries and inventions to encourage them to communicate with one another, and to a broad university audience details relating to their policies, procedures, methodology, etc.; and (4) through an effective program format to maximize effective communication among all institutional representatives relating to pertinent problems now impeding the flow of "technology" into the market place. (Author/KE)

# TECHNOLOGY TRANSFER

# UNIVERSITY OPPORTUNITIES AND RESPONSIBILITIES

A Report on the Proceedings of

A National Conference on the Management
of University Technology Resources

At Case Western Reserve University

October 15 and 16, 1974



Cover: Wade Commons in CWRU Dormitory area where Conference was held.

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# PREFACE

In the recent past so much has been said and written about "Technology Transfer" that it has become a catch phrase. With respect to Universities, however, more attention seems to have been given to the broad overall concept than to its fine structure. The problem of transferring university "technology" to industry must be addressed in highly specific terms if satisfactory and conclusive results are to be expected. We must depart from the large picture and begin to identify those particular barriers in the pipeline obstructing the flow of research accomplishments into the stream of technology utilization.

It was the general purpose of this conference to identify some of these major obstacles and to explore successful means for reducing or eliminating them.

More specifically, the conference was planned bearing in mind the following objectives: (1) To promote an increased interest among university administrators in the technology potential of their respective institutions; (2) To develop a more acute awareness of the need for more effective management of university technology resources; (3) To assemble university representatives with considerable experience and expertise in the management of faculty discoveries and inventions to encourage them to communicate with one another and to a broad university audience details relating to their policies, procedures, methodology, etc. (4) Through an effective program format to maximize effective communication between all institutional representatives relating to

pertinent problems now impeding the flow of "technology" into the market place; (5) To compile and publish a detailed report on the information deriving from the meeting for the benefit of participating institutions as well as others who may be interested in the future.

The first four objectives have been accomplished with apparent success during the conference. This publication will of course deal with the final objective.

Essentially all of the structured portion of the conference was taped and the participants were asked to go over the tape transcripts to make any needed corrections or additions. Every effort has been made by all concerned to retain the informal flavor of the meeting. It is hoped that the proceedings will reflect this atmosphere which seemed to promote free and open discussion among the conferees.

Allen C. Moore

ACKNOWLEDGEMENTS

As has been stated elsewhere, this meeting could not have taken place without the financial support provided by three major licensing corporations. In this connection, I wish to acknowledge the assistance and advice of Willard Marcy, Vice-President of Patents, the Research Corporation; R. F. Dickerson, Vice-President and General Manager of Battelle Development Corporation; and Alfred R. Johnson, Director of Invention Management, Arthur D. Little, Inc. In addition, special recognition must be given to Norman Latker, Patent Counsel for the Department of Health, Education, and Welfare. His intense interest and encouragement were of principle importance in making plans for the conference become a reality.

The panelists and program participants selected from universities having active patent programs deserve the highest praise for their excellent contributions. Their names appear in association with the major segments of this report.

The real work of reducing plans to practice was carried forward by an able group serving as a Program Committee. Three panels were organized and moderated: "Fundamentals of Patent Policy", by Ralph Davis; "Internal Administration of Technology Transfer" by Earl Freise; and "Mechanisms of Technology Transfer" by Irving Antin. Berry Cobb moderated the session on "Reports of Current Status of University Patent Management". A. P. Rosenberg moderated the session on "Available Corporate Assistance". Informal Discussions on the second day of the Conference were also moderated by the same

members of the Program Committee. Without this Committee there would have been no Conference. Therefore, these men also deserve our warmest gratitude for their valuable efforts.

Lastly, credit must be given to Dorothea Regal, Case Western Reserve University's "professional" on handling meeting arrangements, and to all the members of the Office of Research Administration staff for a wide variety of assistance: Ralph Rodriguez, James Koppenhaver, Charlotte Horton, George Stadler, Terry Kurth, Carole West, and Freda Bonner.

ACM

An Updated Statement from
the Keynote Speaker
ON THE HORIZON: A NEW GOVERNMENT PATENT POLICY FOR NON-NUCLEAR ENERGY RESEARCH AND DEVELOPMENT

Betsy Ancker-Johnson,*
Assistant Secretary of Commerce
for Science and Technology

In my remarks to the Technology Transfer conferees on October 15, 1974 I spoke extemporaneously and candidly about the challenge confronting the university community in the area of government patent policy. Now two months later, I have been asked by the Conference Chairman whether I would care to submit some written remarks for inclusion in the Conference proceedings.

For this opportunity I am most grateful. Rather than attempt to recreate my previous remarks, which were intended to be conversational in character, I prefer to make use of this opportunity by updating that portion of my presentation which dealt with the status of S. 1283, the Non-Nuclear Energy Research and Development Bill. This choice reflects my conviction that, for better or for worse, S. 1283 will have both a profound and enduring impact on the industrial utilization of university-generated research advances.

The text of the patent provision in S. 1283, as reported out of the Senate-House Conference Committee on December 11th, remains unchanged from that which was negotiated between Senator Hart and the Administration. Inasmuch as my office represented the Administration throughout these negotiations, I am aware not only of the strong points of the present provision, but also, and perhaps more acutely, of its weaknesses.

*See Appendix B for biographical information

To the extent that we had any bargaining power at all in our confrontation with Senator Hart, the entire credit must be given to Congressman Don Fuqua, a Florida Democrat and a member of the House Science and Astronautics Committee. It was he who led the successful floor fight last September which resulted in the deletion of the patent policy section that had emerged from the House Interior Insular Affairs Committee.

Congressman Fuqua announced that he would lead yet another floor fight if the House Conferees brought back a package which did not accord with those principles which I, as spokesman for the scientific community and the Administration, had enunciated in my testimony before the Interior Committee. It was the fear of this second floor fight, potentially jeopardizing the whole of S. 1283, which brought the Senate to the conference table.

What, then, did we bring away from the table?

We have, essentially, a title policy. The major tenet of this policy may be expressed as follows:

> THE GOVERNMENT WILL TAKE TITLE TO ANY PATENTABLE INVENTION WHICH IS CONCEIVED OR FIRST ACTUALLY REDUCED TO PRACTICE IN THE COURSE OF OR UNDER ANY ERDA R&D CONTRACT.

So far as government-financed inventions are concerned, the Senate would have inserted a period at the end of this sentence.

I am confident that many of our universities hold patents or inventions which have never been "actually reduced to practice." Remember, the mere filing

of a patent application on the concept is not an "actual" but rather a "constructive" reduction to practice. Patents which fall into this category can be lost to the government if the first actual reduction to practice occurs under a contract between the patent owner and ERDA. There are two ways to protect your patent rights in this situation. You can refuse to enter into a contract with the government...or you can achieve the first actual reduction to practice at your own expense outside the contract. The difficulty which exists here is no different from that which you face under NASA and AEC contracts today.

Now I recognize that the establishment of a title policy for ERDA constitutes a dismal beginning. You will be happy to know, therefore, that there are exceptions to this policy. The principal exception may be stated as follows:

> THE ADMINISTRATOR MAY WAIVE TITLE TO ANY INVENTION, EITHER AT THE TIME OF CONTRACTING OR AFTERWARD, PROVIDED THAT CERTAIN CONSIDERATIONS ARE SATISFIED, AND PROVIDED FURTHER THAT THE GOVERNMENT RETAINS A LICENSE FOR ITS OWN USE, AS WELL AS CERTAIN MARCH-IN RIGHTS.

The first step in getting a waiver is to ask for it, either at the time of contracting or after the invention is made.

The next requirement is that the Administrator sit down and reflect on a number of considerations which the Congress feels should be in the forefront of his mind whenever he makes a waiver decision. More on these considerations

in a moment.

It is important to note that there is no hearing connected with a waiver determination. Nor is there any provision for third party participation. And finally, there is no court review of the Administrator's determination .

Now since it is easy enough to ask for a waiver, the important question is whether it will be granted. What exactly are these considerations on which the Administrator must fix his attention? The number of considerations involved is 11 in the case of waivers requested at the time of contracting, and 10 for waivers requested after identification of the invention. Eight of these considerations are the same in each case, and they may be paraphrased as follows:

1. Government's contribution to the field of technology
2. Intended use of contract results
3. Contractor's contribution to the contract, either of money or technology
4. Contractor's contribution to the field of technology
5. Government's intentions regarding further development
6. Public health, safety, and welfare needs
7. Effect on competition and market concentration
8. Technology transfer capability of any university applicant

Focusing on consideration #5, as a for instance, the government would not want to waive title to an invention which it intended to carry all the way through the development process and into the marketplace - such as was done by Agriculture in respect to instant mashed potatoes.

In addition to these eight basic considerations, there are three others which must be attended to when the waiver is requested at the time of contracting.

1. Is the contractor's participation necessary?
2. Will the contractor's participation expedite attainment of program objectives?
3. And, finally, will the contractor's commercial position expedite utilization of the R&D results?

We have two different questions to ask if the waiver is requested after identification of the invention.

1. First, do we need a waiver to call forth risk capital?
2. And second, will the granting of a waiver really help speed this technology into the marketplace?

Let's suppose that, after applying the appropriate considerations, the government decides to retain title; what happens then? As a general proposition, the contractor responsible for the invention will receive a non-exclusive license in the U.S. and full foreign rights in any country where the Administration itself does not seek a patent. Additionally, the Administrator can grant non-exclusive licenses to other parties in the U.S.

In fact, there are many in the Congress, particularly in the Senate, who feel that the best way to commercialize an invention is to insure that as many people as possible have the right to practice that invention.

Our experience in this matter suggests that the opposite is true. Of the 23,401 government-owned U.S. patents available for licensing during fiscal year 1972, only 1,238, or less than 6 percent, were actually licensed. Moreover, the overwhelming majority of those patents which were licensed had only one licensee.

It was for the purpose of correcting this anomaly that we insisted upon the flexibility to license exclusively in appropriate circumstances. The only requirement is that objectors be afforded an opportunity to be heard before an exclusive license is granted.

While I hate to be the bearer of ill-tidings, especially when things are just now beginning to look reasonable, I must remind you that we negotiated this settlement - we didn't write it. We didn't get waiver of title without hearing and exclusive licensing just by asking. We bargained for these features and we did so in good faith.

We took the position that it made better sense to relax the antitrust controls at the beginning of the administrative process, while applying a second look further down the line.

Instead of holding up a hundred waivers because one of them might be ill-advised, why not waive more generously in the beginning and call back the one, if any, after it becomes distinguishable from the 99?

Accordingly, we accepted all of the standard march-in rights, plus an important new one. This new march-in right permits the Administrator to modify or rescind any waiver which can be shown to have transgressed the antitrust

standard set forth in Section 7 of the Clayton Act, notwithstanding the fact that suit could not be brought under that statute because of governmental participation in the questioned activity.

Section 7 of the Clayton Act deals not only with mergers but also with the acquisition of capital assets. A patent is a capital asset.

Suppose that, instead of acquiring the patent on a waiver from the government, you purchased it from a private party. Should that purchase be set aside as a violation of Section 7 of the Clayton Act? That is the question which the Administrator may be asked to decide. If he answers yes, he can rescind the original waiver, or require you to license the patent to other parties, with or without royalties. Obviously, this march-in provision is of greater concern to industry than to universities. In either event, the patent owner is entitled to a hearing before his waiver can be modified or revoked, and the hearing cannot be called until four years following the patent filing date. This protection is inserted to curb unnecessary fears respecting the invocation of this Section. We know of no existing waiver which could be recalled under this clause. We doubt that one will ever arise.

In summary, these are the highlights of the ERDA patent policy.

1. It is a title policy, as distinguished from a license policy.
2. However, the Administrator can waiver title and he is encouraged to do so when such is in the best interests of the United States.

3. The Administrator has the option to grant exclusive licenses.
4. There is no mandatory or compulsory licensing of privately-owned patents - such as called for in the original senate version.
5. And finally, there is no surrender of background patent rights as a precondition of participation in a government contract. This precondition was also contained in the original Senate version.

I am hopeful that the settlement which we reached with the Senate will permit the full force of our private inventive capacity to be brought to bear in the successful implementation of Project Independence. We have certainly come a long way from the draft provisions which existed last September. The crucial question is whether we have come far enough.

PROCEEDINGS OF THE CONFERENCE

# REPORTS ON THE CURRENT STATUS OF UNIVERSITY PATENT MANAGEMENT: THE UNIVERSITY OF CALIFORNIA SURVEY

Mark Owens,*
Assistant Vice President
University of California

There were basically two reasons why we conducted a survey on university patent programs. The first was to find out how we compared in our operation, our volume, our administration with other like institutions; and second, to see if we should tie up with an outside patent management organization. I say this with some hesitation for I don't mean to imply anything derogatory of organizations which handle patent programs for institutions. I am not speaking of the people who are going to be speaking to you tomorrow. We have, however, been deluged in recent years with profit making organizations who have set themselves up as patent management organizations on a for-profit basis. Probably most of you have been approached by this type of organization. The proposal is that you sign up with them on an exclusive basis not on a permissable basis as is the case with the Research Corporation, Battelle Development Corporation, Arthur D. Little, Inc., etc. So our desire was more or less as a defensive measure to check and see if we should tie up with one of those organizations or to determine that we were doing all right by ourselves.

To accomplish this, we sent out questionnaires to some 25 educational institutions about a year ago, and received responses from 22 of the 25. The period covered in the survey was for the years 1968-1972. Let me just read to you the names of the participating institutions so you can get some feel of the type of

*See Appendix B for biographical information

institutions which were involved. These were: The California Institute of Technology, the University of California (we included ourselves), Carnegie Institute of Technology, Columbia University, Cornell University, University of Florida, Georgia Institute of Technology, Harvard University, University of Illinois, Iowa State University, Johns Hopkins University, Massachusetts Institute of Technology, the Universities of Michigan, Minnesota, and Missouri, Purdue University, University of Rochester, Rutgers University, University of Southern California, Stanford, University of Washington, and the University of Wisconsin.

The survey revealed that most, but surprisingly not all of these 22 institutions who responded to us, encouraged the disclosure of inventions. The majority of institutions have a mandatory assignment requirement. If the invention was generated as a part of the employees university activity, they reserve the right, either by patent agreement, or by institutional policy, or something of this sort, to require the assignment of invention to the institution.

All of those institutions which have an active patent program share royalties with the inventor in some degree or the other. In three cases, the royalties are negotiated on a case by case basis, apparently prior to any royalty income coming in, as a part of the assignment process. In four cases the departments in which the inventor is employed share the royalties with the inventor: the institution, the inventor and the department, share royalties on some basis. In most cases the inventors get from 15% to 50%, this is probably on a net rather than a gross basis. In many cases it's just on the 15% gross basis. Of these 22 institutions, and keep in mind this was a year ago, 13 of them have institutional patent

agreements with the U. S. Public Health Service. Only two indicate any increase in activity as a result of that institutional patent agreement.

As far as the expenses of operating a patent program are concerned, there were such varied answers that I think the question wasn't really as clear as it should have been. Some institutions listed the salaries of the people who were directly involved with the handling of the patent program. Some listed the salaries of the people who were involved and an overhead factor, and some listed only the monies paid out to patent attorneys. Although we have rough figures, which may not hold up too well for comparison, it appears that the expenses to the institution run anywhere from $600 a year up to $470,000.

With respect to program management, (and keep in mind that this is one of the reasons we were having the survey made), we learned that the great majority of these 22 institutions managed their own patent program internally. Six of the institutions have apparently established a separate foundation to handle the patent program. We consider those as part of the great majority that handle their own patent program. Five of these 22 institutions augment their own program by permissive arrangements with outside organizations such as Research Corporation, Dr. Dvorkovitz, Battelle, and so forth. But keep in mind again these are permissive arrangements, not exclusive arrangements. Only one of the institutions which responded is fully managed by a separate outside organization.

Of the institutions responding, 5 had more than $100,000 gross income per year since 1968-72. In one case, that gross income came from 8 inventions, but

almost in all the other cases the income came from one or two inventions. Therefore, as you can see, the pattern is that there is usually one invention, or two inventions at the most, which pretty much carry the patent program.

Since there may be some interest in why many of these institutions chose not to go to one of these outside profit making organizations, let me just note some of their responses to that question. Most of the institutions wanted the flexibility of deciding how to pursue a course of action for themselves. They didn't want to get involved in any exclusive arrangement where they were bound to follow the dictates of some outside organization. The institutions in some cases believe that only by managing their own programs could they maintain what they felt was a necessarily close relationship with the faculty. And they didn't want to have the over-riding interest of the institution, which may transcend the patent interest of the institution, in the hands of an outside organization. Further, in many cases they felt that because of geographical considerations the contacts with profit making exclusive management firms would tend to be sporadic. The institutions felt that prompt interviewing of inventors as soon as inventions are disclosed was really critical to getting the technology out. One of the institutions responded, "No outside firm has been able to demonstrate that it would be more successful in managing the program and/or would be able to serve the best interest of the program, the university, its inventors, and sponsors of research."

-This hits the high points of what we found in our survey.

# REPORTS ON THE CURRENT STATUS OF UNIVERSITY PATENT MANAGEMENT: THE NORTHWESTERN UNIVERSITY SURVEY

E. J. Freise,*
Assistant Director,
Research and Sponsored Programs,
Northwestern University

In the late summer of 1973, David Mintzer, Vice President for Research at Northwestern University, undertook a review of the patent policy and administrative procedures in effect at the University. In an effort to gather information which would be helpful in developing an effective and, hopefully, productive technology transfer program at the University a questionnaire was developed and circulated to 76 selected universities from a list compiled by the NSF of the top 100 universities in federal funds for research and development.

The selection of institutions receiving the questionnaire was based on two criteria:

1. The institutions should have schools or programs which are likely to produce patentable inventions (e.g. Schools of Engineering, Medicine, Agriculture, etc.)
2. Institutions which were judged to have highly successful technology transfer programs, because of unusual circumstances such as very large numbers of technically oriented faculty, coupled with large dollar volumes of industrial and federal research funds, were to be



* See Appendix B for biographical information.

excluded. For our purposes we felt that their responses to such a questionnaire would not be representative of the research and technology transfer atmosphere existing at an institution such as Northwestern.

The federal research dollars of the institutions selected ranged from 10 to 75 million dollars per year.

The questionnaire used will be found in the Appendix Section of this publication. Since the Office of Research and Sponsored Programs was just entering into the area of patent administration, the information requested was of a rather basic nature and often required the respondent to make estimates. However, the purpose was to gather order of magnitude information and to determine what gross correlations seemed to exist. Fifty-four institutions responded. Two of these indicated that they were in the process of revising their own patent policies and procedures and another two institutions indicated that their policies allowed the faculty inventors to work directly with patent development firms such as the Research Corporation. Thus, fifty institutions supplied useable information provided in response to some or all of the questions.

A brief review of the highlights of the survey and our interpretation of the results will be presented.

With respect to the site of responsibility the following question was asked:

"What office and/or university official has responsibility for administering your patent policy?"

The response was:

| OFFICIAL/OFFICE | PERCENTAGE OF 49 RESPONDENTS |
|---|---|
| Research Office | 67% |
| Fiscal Office | 14% |
| Legal Office | 2% |
| Separate Patent Office | 6% |
| Academic Officer (i.e. Provost) | 10% |

In 5 of these institutions the responsibility is shared with another office, but since an individual from a Research Administrative Office responded, these replies were included in the percentage shown for the Research Office.

In responding to the question on how a decision to pursue a patent application was made, 27 out of 50 institutions use a patent committee of either faculty or administrators. Nine of these institutions used information from an outside firm such as Research Corporation in reaching a decision. Six institutions had the Committee either working with or reporting their results to an individual who was classified as a patent administrator while the remaining 12 institutions had the committee report their recommendations to an academic officer. Of the 50 institutions responding, a total of 22 relied on information supplied by a firm such as Research Corporation or Battelle, in reaching a decision on filing for a patent, although 42 of the institutions indicated that they had agreements with firms of this type.

With respect to the involvement of professional staff, the question was asked:

"How is the patent program staffed within the university and what percentage of time does each devote to the program?"

The response on time spent by professional staff was:

| Total Time of: | Less than 6% | 10 to 49% | 50% or more |
|---|---|---|---|
| Respondents | 21.0 | 20.0 | 9.0 |
| Disclosures/Inst./Yr. | 7.0 | 16.6 | 52.0 |
| Patent appl./Inst./Yr. | 1.3 | 4.0 | 14.2 |
| Licenses/Inst./Yr. | 0.4 | 2.0 | 4.1 |

As one might expect, as the number of disclosures, patent applications and licenses increases, the amount of professional staff time also increases. From this limited data, and keeping in mind the types of institutions surveyed, the middle column of figures appear to represent the best performance.

With respect to the use of licensing corporations the question was asked:

"Which outside firms does your institution use to promote patents and inventions?"

The response was:

8 used no outside firms

21 used one firm:

| | |
|---|---|
| Research Corporation | 18 institutions |
| Battelle | 2 " |
| Dvorkovitz | 1 " |

21 used two or more firms:

| | |
|---|---|
| Research Corporation | 21 institutions |
| Battelle | 17 " |
| Dvorkovitz | 4 " |

Of the eight who did not list any affiliation with an outside firm, 4 have their own research foundations.

Another question related to covering expenses:

"How are expenses incurred in the University Patent Program covered?"

The responses from 49 institutions were as follows:

| NO. OF UNIVERSITIES | METHOD OF RECOVERY |
|---|---|
| 11 | Royalties |
| 8 | Indirect Cost |
| 14 | Direct University Support |
| 2 | Royalties and Indirect |
| 7 | Royalties and Direct |
| 1 | Direct and Indirect |

(Six Institutions gave estimated percentages as follows:)

| University | % Royalties | % Indirect | % Direct |
|---|---|---|---|
| 1 | 90 | -- | 10 |
| 2 | 75 | 25 | -- |
| 3 | 40 | -- | 60 |
| 4 | 82 | -- | 18 |
| 5 | 28 | 36 | 36 |
| 6 | 50 | 25 | 25 |

Although institutions were asked to provide estimates of the percentages of expenses recovered by the various sources, only six provided actual percentage estimates. The remainder simply checked one or more methods of recovery. It is suspected that many of the institutions which listed direct university support for the program may actually be covering expenses through recovery of indirect costs, since often the expenses are incurred by an office within the university whose operating budget is included in the indirect cost pool for the purposes of calculating the indirect cost rate.

As would be expected, the survey revealed that the number of patent applications is markedly less than the number of disclosures, indicating that a considerable effort is made to eliminate non-patentable and perhaps non-marketable items. However, the interesting feature of the results is that the median number of disclosures is 11 and the median number of patent applications is 3, indicating that for a median school about 27% of the

disclosures result in patent applications, and in turn the median school licenses 2 inventions per year for a ratio of 66% license-to-patent ratio. This figure is much higher than generally quoted by firms such as The Research Corporation which reported that approximately 10% of the disclosures they receive result in patent applications, and of these only 10% result in licenses. In the actual report on the survey, some possible reasons for these differences and cautions on interpretation of these data are presented.

Results on the administrative costs and royalty income for a number of the institutions indicate that while the schools having the highest reported administrative costs are among the schools having a large number of disclosures and licenses, the correlation between these parameters is not simple. The two institutions having very large royalty incomes have, to the best of our knowledge, apparently licensed one major invention each.

In attempting to identify other correlations which may exist among the data, we examined the relationship between the number of disclosures and federal obligations. One might have assumed that a large federal obligation for research at an institution would result in a large number of disclosures. However, the data appear to fall into two groupings. Eighteen respondents definitely belong to Group 1 (low number of disclosures per federal dollar) and 12 to Group 2 (high number of disclosures per federal dollar). The remaining 16 institutions lie in the overlap region.

One might have also assumed that some correlation would exist between the number of disclosures and the administrative costs. However, no such

correlation was readily obvious. This may be because of the crudeness of the data or perhaps reflects the fact that institutions which do not actively pursue patent applications probably have not reported costs involved in having an administrator or faculty patent committee process the disclosure. Once a decision is made to pursue a patent application, costs are more readily identifiable, since some administrative official, and perhaps a patent attorney, are now devoting substantial time and funds to processing the application.

Some correlation may exist between the administrative costs and the number of patent applications filed per year. The reported results of the survey appear to group the responding institutions into those which have relatively high administrative costs per patent application and those with a much lower administrative cost. When comparing these results to those relating to the number of disclosures per federal dollar, one finds that 11 of the schools having high administrative costs per patent application, also have a large number of disclosures per federal dollar, while 9 schools which have low administrative costs per patent application have a small number of disclosures per federal dollar. The other six respondents would fall into one of the other two possible combinations. These correlations can be examined in terms of net royalty income. While certainly the net royalty income can be used to gauge the financial success of a program, it can also be interpreted in the broader sense as some measure of the effectiveness which an institution is having in transfering technology for the benefit of the public.

An important feature which these data appear to indicate is that if

an aggressive and expensive patent program is established at an institution which does not have a large research base, as judged in this case by federal dollars, then the program may not be successful financially, and probably indicates that the research expertise of the institution is not capable of producing large numbers of inventions, which are useful to the public, even though a relatively large number of disclosures per research dollar is obtained. On the other hand, if the research base is relatively large, even if the program at the institution is not well administered, or if the administrative costs are kept to a minimum, then the chances of having at least a program which is not costly to the institution appear to be enhanced. Therefore, based on these minimal data and crude correlations, one has to carefully examine the extent to which an institution develops its technology transfer program.

A complete discussion of these correlations, together with more detailed data, is given in the survey report which is available from Northwestern University. Certainly, this area of study deserves further investigation and collection of better data to see if these preliminary observations and correlations can be verified.

# FUNDAMENTALS OF PATENT POLICY: PATENT POLICIES FOR EDUCATIONAL INSTITUTIONS

T. L. Stam,*
Patent Officer,
California Institute of Technology

I'm going to talk about patent policies for educational institutions: what they are, why you have to have one, whatever it is, why you should want to have one, and what it should do. I'll start right off by saying that this is going to be a fairly elementary discussion, hopefully to stir up questions and answers later in this session or in the meeting we will be holding tomorrow.

I prepared this paper talking about policies and I suddenly realized that part of the problem, to the extent that it exists in various places, is a combination of policy and administration. Practically every institution has some kind of policy. The question then is to what degree do you administer it? I'd like to preface the rest of my paper by saying that when I talk about policy, I'm talking also about what you do about implementing that policy, the administration of it, because this really is important. Before I launch into this subject I'd like to make a general observation that it is my experience that no two institutions do things alike. There are substantial differences in the internal policies and philosophies of various institutions. There are legal restraints, particularly in the case of State Universities, and so on. The net result is that procedures in use, plus the degree of commitment to technology transfer, disposition of income,

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* See Appendix B for biographical information.

and the like are extremely variable. Accordingly, all I can hope to give you is a cross section. In our later discussions perhaps we can bring out some of the institutional variations and make some sense of the problems. The purpose would be for each of you, in the institution you represent, to evaluate those things we have to say and apply whatever may fit and be useful to your own case. I hope that my presentation will lay out the functions you ought to perform and what the basic requirements of educational institutions should be. And these may be a matter of choice. I would hope to touch briefly on the major categories, but only sufficiently to generate questions which may be specific to individual institutions.

My particular subject will be a definition of patent policy and a statement of what I consider to be the basic requirement and function of a patent policy, with some emphasis on what is probably mandatory and what might be termed as optional. First, we should define patent policy. My definition would be that patent policy for any institution is whatever it wants it to be. It may be its policy simply to ignore the whole matter, or to have minimal machinery for filling obligations to sponsors, or to have sophisticated machinery for identifying and evaluating inventions for filling obligations to sponsors, for acquiring title to patents and for licensing. I guess what I want to talk about and really define is what a good policy should be. And again I would like to stress the point that for each individual institution the nature of the policy or program and its size may vary depending upon the size and nature of the research program and many other factors. First, I would like to eliminate the no action or

"no policy" as simply being unacceptable, since it ignores contractual, moral and ethical obligations. At the very minimum, even if an institution does not choose to protect the interest of itself and its faculty or to concern itself with the public interest, it still has a contractual obligation to identify and report inventions in connection with most sponsored research. This then would require what I have called minimal machinery: that is, some structure or assignment of responsibility, either faculty or administration, for monitoring sponsored research for the fulfillment of contractual obligations relating to the identification and reporting of inventions.

In my opinion, neither the "no policy" nor the minimal machinery policy is a good policy. A good policy should protect the rights of the institution and of its faculty and staff in inventions, and should permit the institution to assume its responsibility and obligations relative to its sponsors and to the general public. In this regard, I should point out that it has long been felt by institutions which do not have full programs that over and above responsibilities to itself and to its faculty and staff, the research and educational institution has a dual responsibility to its sponsors on the one hand, and to the public on the other. The responsibility to the sponsor is one which I have mentioned before; namely, the moral and ethical and contractual obligation to fulfill requirements relating to inventions which are incorporated in terms of the grants and contracts under which the institution accepts funding for research. Secondly, and perhaps less readily recognized and understood, there is a responsibility to the general public to make an effort to have advanced technology developed by

such institutions made available to the public in the form of new and improved products. When patent licensing, or the offer of a proprietary position to a manufacturer, is the best tool for effecting such transfer of technology to public use, then a patent licensing program forms an integral and necessary part of the patent policy. Parenthetically, such programs may offer the possibility of substantial income to the institution, although this expectation by itself should not necessarily be the reason for undertaking such a program. In summary then, a good patent policy would protect the institution and its faculty and staff insofar as rights are concerned, and would fulfill both the contractual obligation of the institution to its sponsors and its obligation to the public to seek to provide the results of new technology to the public in the form of improved goods.

Also of importance is the fact that there is some evidence of a growing consciousness on the part of federal agencies, which sponsor a large proportion of the type of research we are discussing, in technology transfer. As a result there has been, and probably will be, an accelerated tendency for such agencies to favor sponsorship of research at those institutions which have a mechanism, or at least an arrangement, to assure that some effort will be made for commercialization of the results of federally supported research. If for no other reason, every educational institution seeking federal sponsorship for research should seriously consider the implementation of a good policy which will be attractive to such agencies. Accordingly, then, it is my thesis that every institution engaged in sponsored research should have a good patent policy - what I have defined as

good patent policy - and that it should have or create policies and administrative procedures and an organization for fulfilling the necessary functions. What the precise language of a policy statement or the organization established should be, and indeed the philosophies involved, may vary from institution to institution. And all we can do here is provide some food for thought and some guidelines. It is my thought that what I have said thus far, and what other speakers will say in the balance of this meeting will give suggestions as to policy formulation. In this connection I would like to call your attention to the booklet put together by the Committee on Governmental Relations of NACUBO.* Copies are available on the reception table.

Assuming then that an institution has created policies and procedures to deal with patents and to handle the essential functions I have mentioned (including provisions for establishing relationships with sponsored research policy and policies relating to licensing philosophy and royalty distribution), the next question is how do you implement such a program? First, it must be stated as obvious that the size of staff and the nature of people necessary to the effort will vary with the size and nature of the research effort involved. The staffing should be approached from the point of view of assuring responsibility for and performance of the functions which are essential to a good patent policy. To repeat, these functions are: (1) innovation, identification and reporting; (2) evaluation as to patentability and commercial importance; (3) title acquisition; (4) patent prosecution; and (5) patent administration, including the licensing function. Prior to

* "Patents at Colleges and Universities: Guidelines for the Development of Policies and Programs" (1974)

a discussion of staffing, you should be reminded that there are organizations geared to performing or helping or advising in the performance of almost all of these functions for educational institutions. This is one of the alternatives available for implementing a program. Arthur D. Little, Inc., The Research Corp., Battelle Development Corp., and others are available for such purposes and are all represented at this conference. There are pros and cons to involvement with such groups. The preference of my particular institution, California Institute of Technology, is not to use such organizations. For other particular schools there could be justification for such affiliations.

The balance of my discussion as to staffing will be based on the proposition that you're going to do it yourself and if so, what kind of people do you need? You should be aware that certain of the costs of administering the patent clauses of federal grants or contracts can be reimbursed and with appropriate advice from your accounting people this is a fact to be considered in staffing. Moreover, depending on the size of your effort and the nature of your organization, you might need one or more persons for performing each function, or you might have a single person responsible for all. As an example, at Cal Tech, which has a small student body and a relatively large research effort, only one man, myself, has all of these responsibilities. Obviously I have assistance from our entire organization, but the fact remains that one person can be the spearhead of the organizational effort and be responsible for seeing that it gets done. You can do this if you have effective liaison between your faculty and your administration. Now let's get to the functions.

First, as to innovations, identification and reporting. One person should be responsible for monitoring research, identifying innovations and reporting to sponsors. This should involve personal contact with laboratories and investigators and monitoring of publications. While ideally it can be performed by trained patent attorneys, whether on staff or retainer, I personally see no reason why any serious minded, technically oriented faculty or administrative staff person could not perform this function with little or no training. It is simply a question of looking for a statement concerning novelty in a publication as it comes through. I repeat, while a trained patent attorney is the best route to go, other people could be easily trained to perform the function.

The next function deals with the evaluation of identified innovations as to patentability and commercial application. This also may be accomplished by placing primary responsibility in an individual. In this case it is appropriate business for a legally trained person. In my opinion it should be an administrative and not a faculty function. It is preferable to have some faculty or administrative advisory council or committee set up to assist the responsible individual in the evaluation and in making decisions as to whether the institution will invest time and money and seek to acquire title to any given invention.

The function of seeking to acquire title can become complex and legalistic. Terms and conditions of various agencies and private sponsors vary substantially, as does the philosophy. There are times when this is taken care of during the period of negotiation of the grant or contract. There are times when an agency may have a waiver provision. This must be taken into

account during the negotiation process. Generally speaking, such matters could be handled by a knowledgeable contract administrator, and often are, but my recommendation is that, as necessary, legal help (preferably patent counsel) be utilized both in the negotiation stage and in the waiver of title stage.

The function of patent prosecution will almost always be performed by outside hired patent counsel. Although it is conceivable that a large enough operation might have house patent counsel on staff for such purposes, I advise against it, since I prefer to have the widest possible choice of attorneys open to our program, so that I can select the attorney best suited to the prosecution of a patent application in a particular technology. The only requirement that I would place upon the institutional organization is that some administrator have the responsibility for the selection of attorneys, for assignment of cases to those attorneys, and/or monitoring the quality of their work.

The last function involves the patent licensing program and its administration. This is one area where institutions not having the know-how must decide whether they want to acquire it or turn patent properties over to an organization such as Research Corporation., Battelle, Arthur D. Little or UPI. In theory, and in practice, several institutions do both. A person on the staff can have responsibility for making contacts and negotiating the terms of license agreements and for policing and administering such agreements. A single person can fulfill this responsibility if he is qualified, or has competent general and patent counsel available to him.

In summary, then, there should be written policies and administrative procedures for performing the functions I have discussed as minimal for a good patent policy, and staffing and organization for accomplishing those functions. You can farm it out or do it yourself, either by assignment of responsibility to existing faculty or administrators, or you can create a special position or positions having the responsibilities. Once again, it depends on the size of your operation. The important thing is, if you assign it to a faculty member or an administrator, be sure that he really performs the function. I guess I became very conscious of this listening to Mr. Freise. Probably a large difficulty is the danger of assignment of the duty of fulfilling these functions to people who don't really perform.

I have also been asked to talk about distribution of royalty income. Thus assuming that you have a full program, with royalty income, the question is what can you or should you do with it? In the first place, it is customary in the university community for the faculty or inventor to share in royalty income. Preferably the percentage of sharing should be established in written policy so that when a faculty member comes aboard, the relationship is fixed and remains so. Under such policies there is a good deal of variation. As Mark Owens told you, it varies from 15 to 50 percent. Some schools have sliding scales or actually bargain with the inventor in each case. Whatever the arrangement chosen by a given institution, it is wise to let the faculty body establish the policy. We have found at Cal Tech that the percentage written into the policy is questioned from time to time. The question always goes back to the faculty body in having to examine it. They have always left it exactly where they set it 30 years ago. And what

this does is to take the patent administrator and the administration off the hook. It's a faculty decision. The remainder of the income can be used as desired. Both the policies of the institution and sometimes the nature of its charter may prescribe the nature of the distribution. Generally, I think we can assume for the purpose of this discussion that we will all use the money for furthering of educational science. As a matter of fact, Cal Tech is limited by charter to such usage. Some schools may put royalty income only in a general fund to be used where it is most needed. Others feed some income from each invention back, at least in some degree, to the division of the institution in which the invention was made. I think such matters are simply matters of choice determined by the needs and philosophy of your own institution.

# FUNDAMENTALS OF PATENT POLICY: THE UNIVERSITY - SPONSOR PATENT POLICY RELATIONSHIP

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One of the important aspects to be considered in formulating an institutional patent policy is that it mesh with the policies of the agencies which fund research at the institution. It is imperative that this take place to minimize the number of conflicts between the institution's policy and an agency's patent requirements. When these conflicts do arise, the opposing policies place the faculty member seeking support in the middle, and if he is denied funding for a project which is quite important to him for any reason, there can be adverse attitudes generated towards the institution's policy and even to the entire patent program. It is a good idea, therefore, when establishing a patent policy to build in enough flexibility to allow determinations as to when and where it is permissible to depart from the policy in seeking funding.

There are three broad areas of funding which we must consider for purposes of this discussion. Although Federal funding is by far the most important, I would prefer to treat it last because of the intricacies involved. The other two sources, will, therefore, be given our first attention. Among private funding agencies, the vast majority of them make no mention of patent or patent rights in their granting documents. However, two organizations dealing with health matters do not follow this practice. The American Heart Association and the American Cancer Society, stipulate policies on the handling of inventions that may arise from their sponsorship.

* See Appendix B for biographical information.

Of the two agencies mentioned, the patent policy of the American Heart Association is the most realistic from a University point of view. An essential caveat of the Heart Association's policy is that its inventions be administered in a manner that will bring them into public use at the earliest possible time. The American Heart Association recognized that this may be best accomplished through patenting and licensing in a manner consistent with the public interest. The Heart Association defers to those institutions that have an established patent policy and a procedure for administrating inventions, subject to certain restrictions, the most important of which are: (1) that the inventors income share will be no more than 15% of the gross royalty income, and in no event more than $100,000, and (2) that the Heart Association shall participate in any royalty income derived from the invention to an extent to be determined by mutual agreement between the institution and the Heart Association. Here we see the first instance of the importance of having an established patent policy and the administrative structure for handling inventions.

The American Cancer Society is somewhat more restrictive in its policy on patents, providing that no application will be filed without the prior written consent of the Society, and that inventions and patents made under its grants be assigned to the Society. In exceptional cases the Society may grant exclusive licenses to third parties for a period not to exceed five years under a royalty arrangement not exceeding five percent. The Cancer Society obviously does not leave any room for patent management by the institution.

A second area where flexibility in an institutional patent policy is essential is in contracting for research with industrial sponsors. In such

situations it is common for the intended sponsor to seek rights, either license rights or title to any invention that may be made. Although under private agency and Federal support, it is permissible for an institution to participate in cost-sharing by performing research at less than full indirect cost recovery rates, in most cases, under an industrial contracting situation the institution must insure that their indirect cost recovery is sufficient to warrant pledging the use of the University's equipment and facilities to cover such costs. Any recovery short of this results in the subsidy of a private activity with institutional or public funds. At the University of Minnesota we pondered for quite a time over how we should handle these industrial contracts. Title was frequently requested by the industrial sponsor and often times in the past, research was conducted for industrial organizations at the negotiated Federal indirect cost recovery rate. This, of course, resulted in a shortfall of cost recovery for the University and in effect, a subsidy of the company's research. We concluded that this practice must come to a halt. Therefore, in an effort to satisfy both an industrial sponsor's need for patent rights and the University's obligation to recover its costs in private relationships, the following indirect cost recovery policies were evolved:

1. Industrial research that is of academic interest may be conducted at the then current Federal negotiated indirect cost recovery rate, but this rate will carry no obligation to treat the sponsor any differently than the general public with respect to the patent rights. While cost recovery at this level is less than full, it is justifiable from a public policy standpoint if University resources are not being completely utilized and some fixed costs are being recovered.

2. Full recovery of the University's indirect costs will be accomplished where the sponsor pays the then current Federal rate plus 25% to cover the disallowed and other indirect costs not built into the Federal rate. Currently at our institu-

tion, this will produce a full indirect cost recovery rate of 75%. At this level the sponsor will be granted a first right-of-refusal to a limited-term exclusive royalty-bearing patent license under terms and conditions that are reasonable in the industry.

3. In those instances where the sponsor desires and the University agrees to make an assignment of title to any invention that may result from the research, the rate will be set at 50% above the Federal negotiated rate, i.e., 25% above the license option. Where this option is to be employed, the proposed research agreement will be reviewed with the University Patent Office for determining that the proposed assignment of title will not impinge on the University's commitments under other sponsored research programs or its own equities and technology under development.

The third category, and by far the largest sources of funding for the education community, is from the Federal Government. Federal support comes in the form of grants or contracts. There once was a time in the post-World War II period when there was an apparent difference between a Federal grant and a Federal contract. However, in recent years the terms and conditions of the funding documents in grants have become more involved and have approached in complexity and restrictiveness the terms and conditions in Federal contracts. Thus, the distinction between the two is no longer as clear as it once was. Generally speaking, however, it can be said that Federal contracts apply to a work product which has been more closely specified or defined by the agency. Also, contracts usually are used where the subject matter of the research has been proposed by the agency to the contractors rather than where the proposal originates with the contractor and is submitted to one or more agencies. There seems to be no uniform criteria as to what is a grant and what is a contract. One agency may call a certain type of work a contract and another agency will

call it a grant. The use of terms, however, is not very material. What the institution must be concerned with are the terms and conditions in the granting document which deals with the right of the institution to assume rights in inventions that have occurred under the support and the right to do all the things those rights entail.

There are eight Federal agencies that sponsor the bulk of the research projects that flow into the educational community from the Federal Government. These agencies are the National Science Foundation, the Department of Health, Education and Welfare, the Department of Defense, the Atomic Energy Commission, the National Aeronautics and Space Administration, the Department of Agriculture, the Environmental Protection Agency and the Department of Transportation.

The first three of these agencies, NSF, HEW and DOD, generally employ a license clause policy i.e., one which permits the institution to retain title and give the agency a paid-up license for governmental purposes. They also employ what one might call an institutional patent agreement type of operation with respect to inventions developed in the educational community. I use the term institutional patent agreement advisedly here because the Department of Defense does not have a formal agreement such as that developed by the Department of Health, Education, and Welfare. It does, however, approve of institutional patent policies. Published in Defense Procurement Circular No. 65 is a list of institutions whose patent policies have been approved by DOD and which, therefore, have been granted the right to take title and license certain kinds of inventions that arise from DOD research.

While DOD has been using what is called the license clause for years, in its Army, Navy and Air Force contracts, the credit for developing the institutional patent agreements as such must go to the U.S. Public Health Service. This was a very farsighted concept developed in the early 1950's. The agreements consisted of nothing more than an exchange of letters between the institution and USPHS which set forth in a very general way an understanding permitting the institution to take title to and manage patents that arose from the sponsored research. In 1968, HEW developed a more comprehensive and probably more legally enforceable institutional patent agreement, which spelled out the terms and conditions in great detail for the assumption of patent rights. In 1973, the National Science Foundation inaugurated a similar institutional patent agreement program and a number of educational institutions have availed themselves of the opportunity to assume title to patents under its provisions. Those of us who are in university patent administration would find our lives quite a bit easier if we could operate under institutional patert agreements across the board. Of course that is really pie in the sky because there are some agencies that are so far from an institutional patent agreement, that I am sure that we, our children, nor our grandchildren will ever see one.

A second group of agencies, those which operate under what is termed a "title clause," i.e., reserving title to the agency of inventions that occur under their sponsorship, consists of the Atomic Energy Commission, National Aeronautics and Space Administration, Environmental Protection Agency and the Department of Transportation. I group these agencies together because while they reserve title to the Government, they also have policies for and practice, at least to a limited extent, a waiver program to permit title to go

to the contractor. Two of these agencies, AEC and NASA, have their patent requirements established in enabling legislation and theoretically do not have as much flexibility to handle patentable subject matter. It is not an impossible task to obtain a patent waiver from them (in fact, NASA is quite cooperative) as it is with the two I will mention next.

They are the Department of Agriculture and the Department of Interior. Both have title policies. Both are inflexible as their patent needs relate to the "agency mission," and both are nearly impossible from which to obtain a patent waiver.

Use of the title clause by the last six named agencies is reinforced by their particular interpretation of the Presidential patent policy statement of August 23, 1971, Section I. This section is widely incorporated into agency patent regulations and provides criteria for the agency to employ in reinforcing the philosophy and attitudes it held prior to the enunciation of the President's statement. Section I (a) of the Presidential Statement provides criteria that constitute an exceedingly fine screen which a Governmental agency can effectively employ to take title to patents that may result from its sponsored research. It is important to note that title clause based on this Presidential Patent Policy Statement is developed at the time the contract is negotiated. Therefore, where an invention might fall outside of the scope of the title provisions if a determination were made after an invention is identified, the use of the title clause effectively preempts such determinations that could be beneficial to the contractor at a later date. Section I(b) of the President's patent policy statement of August 1971, does contain provisions whereby the contractor can obtain

title to patents resulting from the subject research. However, the provisions to this section are aimed at contractors having an "established non-governmental commercial position" and since universities do not have such an established commercial position, we are dealt with only indirectly under Section 1(c) of the August 1971 statement.

The 1971 presidential patent policy statement contains a march-in rights clause which the 1963 statement did not contain. This qualifies the contractor's title by giving the agency the right to grant additional non-exclusive licenses after a period of time, in the event the contractor has failed to take adequate steps to bring the invention into public use. All in all, one can say that both presidential patent policy statements, the one promulgated by President Kennedy in September 1963, and the one promulgated by President Nixon in August 1971, have not had a great impact upon the basic patent philosophy of any particular agency. These patent policy statements are worded in such a way that any agency can read into them its own preconceived requirements and coupled with a term called "agency mission," the agency can be as generous or miserly with patent rights and its relations to contracts as it chooses.

Let us look for a moment at the disposition of inventions disclosed to the Government. If one examines the Annual Report on Government Patent Policy recently published by the Federal Council for Science and Technology for the combined years 1971-1972, he can, if he is willing to make the effort, uncover the dismal track record of the Federal agencies in managing inventions and transferring technology into public use. The tables at the

rear of this little document are masterpieces in obfuscation. What they do show is that while the Government has a huge patent organization and handles a tremendous amount of paper work relating to patents, the interest of Government in patents is in form rather than in substance. For example, during an average year in the 1963-1972 period, it filed 3,594 patent applications. Of these 3,594 patent applications in the average year, 1,638 matured into U.S. patents. For one thing, this certainly indicates that there is no faculty evaluation of the patentability of disclosures prior to the time the applications are filed. That is far higher than the abandonment rate experience in the Patent Office. No institution could afford that kind of track record. The report also shows a large number of non-exclusive licenses. This is very misleading and indicates that a number of contractors are taking pro forma non-exclusive licenses on inventions that have been disclosed to the Government to which they were required to release title. These licenses cost nothing and the recipients do nothing with them to bring a product to the marketplace. When one looks at the number of exclusive licenses granted, and this is really the test of whether technology is being transferred and whether products are being developed, one is appalled by the paucity of exclusive licenses. For example, in the six year period, 1967 through 1972, the Government issued 12,204 non-exclusive licenses and only 20 exclusive licenses. Anyone who has been involved in marketing of technology knows that you can't bring forward risk capital with mostly non-exclusive licenses, and that at least a limited period of exclusivity is almost invariably required to bring an invention to commercial realization.

The reason for citing these statistics is a very real one. If the educa-

tional community, and industry as well, are to have a patent relationship with the Federal Government, and we are to be divested of patent rights that occur under research conducted in our facilities, then I think there is a legitimate question to be raised: what is the Government doing with the valuable assets that we're transferring? I think it is obvious that these statistics constitute an indictment of the patent system as conducted by several (not all) Government agencies. The track record of AEC, USDA and Interior come to mind, in particular. Such practices are more of a deterrent to technology transfer than a vehicle. Technology is locked up, so to speak, in patents and the Government is using the patents to control the release of the patented technology in ways that it deems to be in the best interests of the public. In other words, if the invention cannot be licensed non-exclusively, it will not be licensed at all. This is a perversion of the intent under which large amounts of money are appropriated for Government research. It behooves this group to make whatever efforts it can to bring about a more widespread use of the license clause in Government grants and contracts for education institutions, and to also make a sincere effort to increase the utilization of the institutional patent agreement technique.

There are two areas that I would like to touch upon briefly before I conclude my remarks. The first relates to a small but concerted and effective effort by several colleges and the universities to obtain favorable recognition for educational patent policies and their unique position to market technology under the Energy Bill, H.R. 13565. The second relates to the two lawsuits, Public Citizen #1, Public Citizen #2 brought against the Administrator of General Services Administration. As a kind of corollary

to these suits there is a third suit between a private corporation as the plaintiff, and the Department of Health, Education and Welfare and the University of Minnesota as codefendant, which I would also like to touch upon.

Both of these matters, the Energy Bill, and the litigation in the courts undertaken by Public Citizen Inc., arise under competing patent philosophies in government as to how rights in inventions should be disposed of. On one side is a group which traces its lineage back to Senate Russell Long of Louisiana and the so-called Long Amendment to Public Health Service Act in 1965. As precedent for the Long Amendment, its supporters were looking back to the Atomic Energy Act of the late 1940's and the National Aeronautics and Space Administration enabling act of the late 1950's. The proponents of this philosophy generally subscribe to the thinking that where Government money is involved in research, the Government should take title. In some instances, this philosophy applies even though the Government investment is minimal. The philosophy further holds that the public interest is best served by the Government managing i.e., controlling the use of patents that are based on Government funded research. Opposing this philosophy are those who believe that the public interest is not adequately served by the Government merely acquiring the naked property right represented by a patent, but is served only when the fruits of Government research in the form of products and processes are made available to the public. This group holds that flexible policies on patent licensing will enable the incentive system to work best to bring inventions into the public use and advocates that Government policies be framed to emphasize the utilization of the fruits of research.

H.R. 13565*is a bill to establish "a national program for research and development in non-nuclear energy sources." This bill is like motherhood, the American flag, and apple pie. There is a widespread feeling that it is long overdue and strong support exists for research in non-nuclear lines to maintain our living standards and retain some semblance of environmental quality. The provision in the original draft of the bill that was so objectionable to the educational community was the patent Section, Number 7, providing, in essence, that the Federal Government retain all inventions and patent rights in connection with discoveries made by grantees or contractors receiving energy research awards. These provisions ran directly counter to the educational community's experience and interest in technology transfer in the public interest, and if enacted, would result in the bottling up of a large segment of important technology. If the Government's past record of technology transfer is a basis for prognosis, the private sector would have only limited access to these research results, thus impeding rather than fostering the development of new energy sources.

Last June it became apparent that the Energy Bill was to come to the floor of the House with the patent provisions originally inserted by Representative Udall. At that time under the leadership of the Association of American Universities, quite a number of the educational institutions represented here at this meeting were alerted to the fact that here again the interests of the educational community were being completely overlooked by the Congress in the formulation of the law as it relates to technology transfer through patents. Thereafter, an active and concerted effort came into being to modify the patent provisions of the Energy Bill. One effort

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* cf. to S1283

that apparently paid off, was that by Mark Owens of the University of California, who approached Representative Kastenmeier of Wisconsin and provided specific language to provide for university technology transfer in the public interest. This was the first instance in my knowledge that our patent position has been embodied in Federal legislation. Concurrently, Representative Fuqua of Florida was approached and he introduced an amendment which in affect, stated that not later than six months after the effective date of the act, that the Administrator of the Energy Agency will report to the President and Congress concerning the applicability of the existing patent policies affecting the energy programs and make recommendations concerning amendments or additions to statutory provisions which are deemed to be advisable. This six month period should provide the colleges and universities with adequate time to formulate the necessary language for the Energy Bill.

Another arena in which the pro-Government-title forces have come into conflict with the pro-license forces in the past year, is in the courts. Two lawsuits have been filed in Federal District Court, District of Columbia, against Arthur Sampson, Administrator for the General Services Administration. The first lawsuit, for convenience, called Public Citizen #1, was brought by Public Citizen, Inc., the Ralph Nadar consumer advocate group together with eleven interested Congressmen. Public Citizen, Inc., alleged that the regulations based upon the Presidential Memorandum on Patents dated August 23, 1971, which were about to be promulgated by the Administrator of GSA, providing for the issuance by Federal agencies of exclusive licenses to use and develop patents and inventions,(in some cases, without compensation to the U.S. Government) amounted to a disposition of Government property in violation of

Article 4, Section 3, Clause 2 of the Constitution which grants to Congress the sole power to "dispose of and make all needful Rules and Regulations respecting Property belonging to the United States." The court granted the plaintiff's motion for summary judgment, adjudged that the Constitution prohibits the granting of exclusive licenses without Congressional Authorization, that the defendants were not so authorized, and it set aside the regulations promulgated by the defendant.

While this case did not have a direct bearing on the patent position of colleges and universities, it emboldened Public Citizen, Inc. to file a second suit, Public Citizen #2, which attacked those regulations which allowed grantees or contractors to be allowed to take greater rights than a non-exclusive license (i.e., title) at the time of contracting or in advance of the making of an invention. Fortunately, the defensive position of the Government was considerably stronger in the second suit. It was able to marshall strong arguments going to the merits of the case and it was aided by a number of amicus briefs (including one from the American Council on Education). Unfortunately, this case was not tried on its merits but was dismissed on the grounds that the plaintiffs lacked the necessary standing to bring the suit.

The matter is not dead there, however. Another suit has been filed by a private corporation against HEW, its officers, and the University of Minnesota in an attempt to have those regulations set aside under which HEW allowed Minnesota to take title to a patent, the research for which was financed, in part, by a Federal grant. The plaintiff in this case had previously and unsuccessfully attempted to obtain through HEW administrative channels,

a non-exclusive license under the agency's Governmental license, in spite of the fact that there was an outstanding exclusive license.

We see in these last two lawsuits a major challenge to the technology transfer and patent programs that have been nurtured in colleges and universities over the years. If the plaintiffs would prevail in the last mentioned suit, no outstanding license based upon a Government financed invention would be safe from attack. There are hundreds, if not thousands, of these licenses outstanding.

In conclusion, all I can add is that we have our work cut out for ourselves in the months ahead.

# FUNDAMENTALS OF PATENT POLICY: SOME ADDITIONAL COMMENTS

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I'd like to preface everything I say here by admitting that if I qualify as an expert, it's only because I'm more than 50 miles away from home. My first thought is to ask ourselves why colleges and universities should involve themselves in the transfer of technology and develop a viable patent policy. The answer is that such steps serve the public interest and insure equity in the proceeds from inventions. Where Federal grant funds are involved in the support of the research behind the invention, the universities are able to do certain things that the Federal Government cannot do well or do at all. For example, the Federal Government is not able directly to provide the degree of exclusive proprietary protection needed by commercial developers who must invest huge sums in developing certain inventions. They want some reasonable assurance that the company down the street won't copy their expensive development efforts and undersell them before they recover their development costs and a reasonable profit. For a while, the Government had the authority to grant exclusive licenses of limited duration to private companies but, even when they had this privilege, their procedures involved considerable red tape; thus negating their effectiveness. Then along came Ralph Nader with his legal suit and the Federal Government is in a quandry over how far to go; if anywhere; with exclusive licenses.

The point to emphasize is that if you are going to attract a company or

*See Appendix B for biographical information

companies to invest heavily in an untried and untested invention, there must be some vehicle to encourage them to do so. The University with a sensible patent policy and some focal point to administer inventions coupled, perhaps, with outside expertise to handle the patent application details, market investigation, licensing and so on, is in the best position to carry out the important technology transfer role most effectively.

Another thing is to get the attention of the potential developer in the first place, and here the universities or their patent management outlets are in a better position to do that than the Federal Government. With respect to insuring equity in inventions, it should be noted that if the Government takes all, then the inventor gets nothing and the university gets nothing and that's not right; perhaps a by-line, but that's not very much. A patent policy at your institution will also discourage informal technology transfer via a consulting group under which the equities may become more than a little distorted. So, in summary, I think that serving the public interest and insuring equity are the two underpinnings justifying universities to get into this area and develop a viable policy.

I would like also to say a couple of words about the variability of interpretations of government patent policy. The universities have worked with varying degrees of success to promote a policy under which non-profit universities may obtain title and licensing privileges with the least amount of red tape. This has been going on for at least ten years that I am aware of. I've been involved with the Committee on Governmental Relations for about that same

period and more recently as Chairman of the Patent Subcommittee. So I'm fairly well aware of what's going on in this area, and Will Fornell has covered the various level of success that have been worked out. It hasn't been easy. The thrust of the university's efforts have been frustrated by the complexity of the subject area. Simply attempting to explain some of these matters to your favorite congressman involves a massive education job. Then, of course, there is the tendency of some of the Federal agencies and the Congress to couple the non-competitive universities together with private industry. Of course, they are very different and, as such, they should require different kinds of treatment. Then there is the over-cautiousness of some Federal agency people who fear the spectre of fostering monopoly situations (and thus you have restrictive patent policies like the Department of Interior and so on). This is a kind of a formidable jungle in which to make any meaningful progress, but it is worthwhile for us to keep plugging. We are trying through the Patent Subcommittee of the Committee on Governmental Relations to foster educational efforts and to provide information at appropriate times that may influence change. Our Subcommittee is going to be concentrating its attention certainly in the coming months, at this next meeting as a matter of fact, on restating the basis for special treatment for universities due to their non-competitive nature and other unique considerations.

So all the help that we can get from those of you who want to volunteer to draft a white paper or whatever, certainly will be helpful.

FUNDAMENTALS OF PATENT POLICY:
DISCUSSION

Questioner: What is your recommendation on a policy statement as to who is covered. Do you recommend only faculty, or faculty and staff, or faculty, staff and students and especially if you include the students, how do you manage to make them aware of it and agree to the policy?

Mr. Stam: This remains a continuing problem, even for those of us who think we have fully implemented programs. At Cal Tech we are currently looking into some phases of the question you have asked. At Cal Tech it has been our practice to obtain employee invention agreements from faculty and staff so that any inventions created in the course of their work as faculty or staff with the use of the institute facilities is subject to employee invention agreement leaving title with Cal Tech. These agreements are signed at the time of employment and so it is resolved right at the beginning. We found recently after all these years that a vacuum existed as to how we treated students, particulary students who we hired as graduate teaching or research assistants, or who may hold a fellowship from a federal agency. It's my belief in view of our contractual obligations that we should have them under an invention agreement which will allow us to fulfill any contractual obligation we might have to the agency and probably be of assistance to them in fulfilling their own obligation. Moreover, I think it's in the public interest that the institution rather than the individual be in the position to seek and acquire title. I think that most of the federal agencies would agree on that.

Questioner: What is an equitable and motivating percentage of royalties assigned to individuals or inventors?

Mr. Stam: At Cal Tech the percentage is 15%. I might advise you that this was established by a kind of an austere faculty body around 1940. The philosophy behind it was (and once again you get back to the philosophy of the institution and its faculty body) that they wanted to make it high enough to create an air of cooperation. But they did not want it to be of such an amount as to cause people engaged in basic research to lose their objectivity. If you have an engineering school and you want to create applied inventions, you might offer a larger reward.

Another Answer: We think at our school that the front end payment, offers the maximum incentive to the faculty to disclose inventions when income is low (up to $5,000). Since the heaviest percentage goes to the inventor he will do the necessary "red tape" which goes along with filing a patent application. And yet it doesn't become the tail wagging the dog. After the royalty income reaches a certain level it slacks off and ultimately the institution's share exceeds by far what the inventor gets. I think it's important to minimize the tendency to perhaps bootleg research simply because faculty members don't get an equitable share from the university. A policy as described will encourage the inventor to report inventions especially when there's no expense to the inventor.

Questioner: Was it 15% gross or net?

Mr. Stam: In our case it's gross. I think these remarks simply illustrate that it's an open matter and you have to look at your own philosophies and your own aims and goals and the nature of your own faculty body and come up with something which satisfies them and the institution. For one thing, some of the agencies place a limit on royalty income paid to the inventor. The institutional agreements of the NIH place a limit on royalty payments probably for the same reasons we do. Our faculty has done so to itself.

Questioner: Do the institutions represented on the platform make a distinction between the individual faculty member supported by sponsored programs versus that individual who is basically working in a laboratory furnished by the institution?

Mr. Fornelli: As far as our institution is concerned we make no distinction. We feel that once a man has kind of broken a barrier and is using university facilities, then the university has right of first refusal to the invention.

We do not distinguish between sponsored and unsponsored work insofar as overall rights are concerned, but the university does disclaim any vested interests in inventions that are developed entirely on a faculty man's own time and not involving use of university resources. In the event that he feels that he is in such a position we do ask that he clarify this, get his departmental chairman's endorsement and we then will formally waive institutional rights.

Mr. Stam: We make no distinction, but I think it is a deeper question.

You have to go back to the philosophy of the faculty body and the institution. There are many institutions which do not have employee invention agreements, except for sponsored research which includes a patent requirement. If you have that kind of set up your question is irrelevant. When every employee signs an invention agreement it's the concensus that we make no distinction.

Questioner: Is there any feel among the members of the panel as to what you might call "know-how" or non-patentable technology that might be license-able, or is being licensed?

Answer: Well, philosophically this is a problem for me and it may be less so for others. I think that in a university situation where you're publishing everything you do anyway, when you're doing most of your sponsored research for government agencies with the responsibility to disclose and publish where you may be subject to the Freedom of Information Act, I find it difficult to figure out how in the world we can sell "know-how" even though we've got an awful lot of it. I get into a bind saying, "Well, how can I charge somebody for this 'know-how' when other people can get it free?" So, we haven't made much of an effort to sell "know-how." We simply encouraged our people to consult. The faculty is free to consult a good portion of their time.

Another Comment: Where we've established that patents are impractical and sponsor's concerned have been fully satisfied, and yet there is a need for a technology interchange between the consultant at the university and the company, wanting to make this thing even without the patent considerations, I have drafted up a three party agreement including the consultant's part of the agreement.

Of course we want to be sure that we don't subvert our own patent policy by going this route. It's only after we have fully established that the patent situation won't work, that we consider such an alternative.

# INTERNAL ADMINISTRATION OF TECHNOLOGY TRANSFER: ORGANIZATION OF A UNIVERSITY PATENT OFFICE

Mark Owens,*
Assistant Vice President,
University of California

Lee Stam mentioned several times in his comments this morning that we all have different ways to do things and the best way is the way it happens to meet your own needs. I can only speak of how we handle patents at the University of California. I am pleased to be able to talk about this subject especially since you may have noticed from the biographical material handed out to you, I am not the Patent Administrator anymore at the University of California. I stopped being that about a year and a half ago, and I can't even claim to be an expert because the year succeeding my last year, the new Patent Administrator more than doubled royalty income. But I like to believe it was because of a good firm base that had been laid in the previous years.

Our structure is perhaps not unique, but we have one unusual feature in that we have a multi-campus University. As you may know, we have nine campuses plus various field stations and laboratories in the University of California system, but this whole system is administered by one organization known as the Board of Regents. We are fortunate in that we managed to convince our Board of Regents when we established the patent policy of the University some years ago that the only logical way to operate, as far as we were concerned, was with one patent organization and not with nine different organizations. The University of California Patent Board is the only committee that reports directly to the Board of Regents.

*See Appendix B for biographical information

it goes through no other administrative head, but reports directly to the Board. This Patent Board consists of eleven people. Now these are nominated by the President and appointed by the Regents. They are all academic people. There is no requirement that they be academic, it just happens that they are all academic, including such people as the Dean of the College of Engineering at the Davis Campus, and so forth. We then have two others to round out the eleven. One is an appointee of the University-wide Academic Senate. This is where the faculty feels it has more input into the structure. And finally there is the Chairman of the Patent Board in which capacity I happen to serve.

Under our policy the Patent Board has all of the authority relating to the handling of inventions within the University. It establishes or recommends policy to The Regents and also has all of the administrative authority to handle inventions. What has happened, of course, is that the Patent Board has delegated all of its administrative authority to the Patent Administrator. The Patent Board meets annually and discusses broad policy questions and so forth. Under our structure the function of Patent Administrator requires a full-time person. The Patent Administrator is located in Berkeley, the University-wide headquarters. The patent staff of the University consists of four people, the patent administrator, an administrative assistant and two clerical people. We have no patent attorneys at all on the staff.

What have we set ourselves up to do now that we have established a patent program and this patent office? What should we be prepared to handle? Not necessarily in the order of importance but perhaps in some sort of order of chronology,

the first thing we want our patent staff to do is to be of assistance to us in handling the actual negotiation of all patent articles. When I talk about negotiation of patent articles, I am talking about negotiations with federal agencies (to the extent that negotiation is possible with some of them), with private sponsors of research, and with non-profit sponsors of research. Although we have a contract and grant office which is University-wide, as well as nine separate campus contract and grant offices, to work with sponsored research, they do not have any authority in the patent area. The only people who have any negotiating authority in the patent area are the people in our patent office. Secondly, we want to make sure that we get all of the possible disclosures we can out of the University faculty and staff. So in order to accomplish this, we have done several things. One, all of our staff and faculty have signed patent agreements and have thus agreed to report to us all of their inventions so that we can examine them to determine whether the University has or does not have an equity. I might just point out in passing, that this is an area where you can have some problems if you are starting a new patent program. Prior to 1963 when we started our new program, the only people who signed patent agreements were people who were working on government sponsored research and every time they got a new contract or grant they just signed the same old patent agreement over again. That patent agreement in essence required that they report inventions so that we could carry out our committments to the sponsoring agency. At that time, incidentally, our policy was that assignment of inventions was strictly optional in the absence of any committments to sponsors. In 1963, we changed to a mandatory assignment policy and required that everybody sign the new patent agreement, otherwise, they didn't get paid for the succeeding month. Well, as you can imagine, people learned

about the patent policy quickly and I must have had thirty phone calls a day for about the first six months. The complaints soon ended when the program became successful, however. It turned out, and I am sure those of you who go into such a program will find out, that the real problems you will have after your program gets started is not taking inventions from people, but in giving them back and telling them you really don't want their inventions. That's when you really get the arguments. The question arises as to how you solicit disclosures. Basically, there are two ways to do it. You can tell people you've got to disclose your inventions. This doesn't work very well. You can hire people to go out and check notebooks and that doesn't work very well either. It's a nuisance, and it takes a lot of time and a lot of trouble. The way to get inventions, we are convinced, (and I know that there is a lot of argument on this), is in making it a financially attractive thing to the inventor to give you a disclosure of his invention. So when we went to our mandatory assignment policy, we also went to a 50-50 sharing of net royalty income with the inventor. We determined net after taking 15% off the top for administration; we then recapture all of our out-of-pocket patent prosecution expenses. We then "impound" the money for a year, and then split 50-50 with the inventor.

After you get the disclosures, what are you going to have your staff do with them? This can become a pretty time consuming and cumbersome procedure. In our system we are talking about between two and three hundred disclosures a year, handled by a four person patent staff, which obviously is a pretty good volume. You have to have some process of review and analysis to determine that the disclosure is worth pursuing any further. The first approach is to have your own

patent staff (and as I say, we are talking about two people who could do this) make a cursory examination to see if the disclosure is at least written in coherent English so it would hopefully make sense to somebody. Then, if it doesn't, we go back to the inventor and ask for clearer explanation. If it does, we then go to ad hoc committees of experts. We don't go back to the Patent Board. The Patent Board doesn't look at disclosures. It is strictly a policy board. We'll look in our campus directories and pick out Professor Jones and Smith on some other campus, who we understand are experts in this particular field, we send them a form letter (we have a lot of form letters - you have to with this kind of volume). In this form letter we ask for their comments on the technology with the guarantee that we will keep their names confidential. We get back the comments from these people, we send the comments back to the inventors, with certain expletives and nasty comments deleted, and ask the inventors for comments, rebuttal, or what have you. This is a very successful procedure. I think we have been turned down maybe five times in twelve years by people who say they are too busy. Usually, the faculty is very cooperative in giving these reviews to us. Another method of review, which we have followed occasionally, is to go to licensees. If we have existing licensees, who we know have an interest in this particular technology, we might go to them, (perhaps on a confidential disclosure agreement, perhaps not), and say, "Here is a new disclosure which we just came up with. What do you think about it? Does it look like it's worthwhile? Would you be interested?" Now, we have received the reviews and the analysis, and the next thing we're going to have to do, is handle that invention disclosure.

There are basically three things we can do with the invention. One is to thank the inventor for having given us the opportunity to look at his new technology, and give it back to him. This happens in a large percentage of the cases. We give it back to the inventor and then he tells us why we were wrong in giving it back to him, and so forth. But many of our disclosures are returned to the inventor with great thanks. Another possibility is to report the invention to the Federal Government, where the government has been a sponsor, and say, "Here it is. You do with it as you choose." If we've decided that the invention is worth putting our money into, we then get an assignment from the inventor. So subsequent to the review, one of three things will happen: we'll report the invention to the government, we'll give the invention back to the inventor, or we'll take the invention, get a formal assignment, and take it from the inventor.

Then we get into the next step of patent prosecution. We have a fund with which we can retain patent counsel and incidentally, this can get rather expensive as you can appreciate. This is why we pay on the basis of net rather than gross. We probably have a sufficient volume to warrant inside patent counsel. We have a large general counsel's office in the University, some sixteen lawyers, but we've never felt it was appropriate to have internal patent counsel primarily because of the geography involved. As you know, our campuses are 600 miles separated, north and south, and that could become pretty much of an administrative and travel burden to be going up and down the state, and secondly, we just don't feel that any one person or two people could really adequately cover all the varying technologies which we come up with, so we try to pick patent attorneys

throughout the state, depending on their technical competence and location, near to the inventor. We watch the work of the patent attorney. We don't censor his work by any means, because we don't have the ability, but we at least make sure that we get copies of all the documents that are filed, check the billings to make sure they are appropriate, etc.

Then we want to be staffed in order to negotiate licenses with prospective licensees, because unless you get a license, you've probably thrown your money away in patent prosecution. We are not concerned with protective patents, we're concerned with making money on our patent program. So the Patent Administrator is then required to go out and try to find the licensees and the lucrative licenses. The way you find the licensees are several. One is just from contacts, which the Patent Administrator has made in years past, with people in industry. Another, and usually not a very successful way as far as we are concerned, is just to pull out Thomas Register and look at all the AAAA companies in the technological field and send them all a letter. That happens to be, as far as we are concerned, a relatively unproductive way of getting licenses. Another way, as I have mentioned, is to go to existing licensees and see if they are interested in picking up another license in this area which we know is within their field of interest. Once we find this prospective licensee the Patent Administrator actually negotiates the license or the option.

After you have the invention licensed you're not through yet, because if you are going to do an adequate job, you have to police your licensee. You know they are all honest people, but, there can be clerical mistakes and accounting mistakes,

etc., so you've got to require as part of your license that you get periodic reports, quarterly reports, or what have you, as to amount of royalty, amount of sales, etc., and you also have to preserve for yourself the right to send your own internal auditors or external auditors, as the case may be, into the licensee's organization to actually check his books in the event you feel that there is a problem.

The Patent Administrator then has the responsibility annually of figuring out, under that rather complicated formulae mentioned earlier, the inventors share of the royalty.

The Patent Administrator is still not through though, because she has at least one more thing left to do. Since we do make a little bit of money with our patent program, she is now required to prepare the distribution of the income back to the campuses. We guarantee every campus a certain amount of money every year. This goes to the Chancellor of each campus (who is the Campus Chief Administrative Officer in our organization) and he can do with this money as he chooses, as long as it is used for graduate students' support.

The Patent Administrator then receives requests for grants from anybody in the University who is interested in getting a grant from the Patent Fund. We get many requests for such grants. The idea is to give people money from the Patent Fund in those areas where, hopefully, there will be more inventions upcoming to keep the Patent Fund growing.

This is a very broad treatment. If you are going to have a complete Patent Program, this covers what you can expect or what you should expect your people to be doing.

# INTERNAL ADMINISTRATION OF TECHNOLOGY TRANSFER: COMMUNICATING WITH THE FACULTY

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The area of communication with the faculty is, in my opinion, the key to any successful university patent program, because only if your faculty understands what you are trying to do, only if you have them working with you, will any program, no matter how well conceived, succeed. It is just as important to have good communications with your faculty, whether they have executed an agreement to assign inventions to the university or not.

The word, "faculty", as used here, refers primarily to faculty researchers; i.e., those university employees involved in research, but also includes graduate students. Faculty members at Iowa State University are pretty nice people, and with very few exceptions, extremely ethical. They appreciate equities. They want everybody to benefit from their efforts. They talk to each other often, and there is a great deal of interaction. If they don't like something, they will tell everybody and if they do like something, they will tell everybody. The word spreads quickly. They will listen to all sides of an argument and make their decision, but they certainly resist arbitrary edicts and pressures.

Faculty researchers have attitudes that have been developed over a period of years that must be considered. If they have come out of the extension area or agriculture, they very often will mistakenly believe that the best way to get

*See Appendix B for biographical information

technology used is to give it all away freely, that all that is necessary is to publish. Some of your faculty members may have very strong anti-business, anti-dollar and anti-patent attitudes as a result of their experience. Maybe they didn't get a job in industry they wanted once, and keep an anti-business attitude without really thinking it through. Most of them don't understand the patent system.

There is also a lot of misinformation around, including many old wive's tales. Every few months we have an inventor saying, "Well, I'll just put it in a registered letter and mail it to myself and then I'll have all the protection I need." Try carefully to explain to him that that isn't going to do him a bit of good.

With so many differing attitudes and wrong information in the minds of your faculty, it's vitally important that you structure any patent policy to fit the objectives of the individual faculty researcher and the university, both from the educational and the research viewpoints. You must convince the faculty you are working for them, not taking something away from them.

Now, the faculty objectives in research generally are directed to developing new knowledge, disseminating it by publication, and thereby having that knowledge used by someone else. Herbert Spencer, the great 19th century philosopher and educator, said, "The great aim of education is not knowledge but action." If you can show your faculty members that through the use of the patent system, by disseminating information that way, they have a better chance of getting some action and getting knowledge more widely used than without that system, you have a good possibility of obtaining a positive response.

For that reason also it is important that we structure our patent policies and systems for administering those policies not for dollars of profit, but rather to further the university objectives of disseminating knowledge and getting technology used. The patent system is the best available and most widely used for information retrieval on applied technology, and through the patenting process you are putting information into the system.

There is another very good argument with faculty in favor of using the patent system. Most researchers in universities don't realize that new developments that belong to all through open publication will not attract the risk capital necessary to bring those developments to the market.

At Iowa State University, we have a Research Foundation which, as a separate corporation, takes assignment of patent rights. The University itself does not take assignment or title to any patents. There is no agreement to assign as a condition of employment by the University. Over the past five years, we have averaged just under $200,000 per year of royalty income from patent licenses. At the present time, we are at a $50,000 per year level, due to the expiration of a major patent. However, we are rebuilding our base quite successfully with several royalty-producing patents, and expect to be back up to the $200,000 per year level in a short time.

Our Research Foundation was founded in 1938, so we have had a system working for a long time and get excellent faculty cooperation. We pay all the prosecution costs if the inventor agrees to assign to us. There are very few cases where the inventors have not come and voluntarily agreed to assign patent rights

to us. When we do receive royalty income, we deduct 15% of the gross to cover administrative costs. The inventor receives 15% of the net income, and this has worked very well. The balance of the net income goes back to the University to fund research, to support graduate students, and to support foreign faculty travel. Since the University cannot use state funds for faculty travel outside of the country, Research Foundation funding of such travel is of great importance. With regard to research funding, we have a competitive University Research Grants Program which we run every year, through which around 100 proposals for research are submitted. We fund the successful proposals from three sources: our NSF Institutional Grant Fund, our NIH General Research Support Grant Fund, both of which are going down rapidly, and our Research Foundation royalty income. Researchers realize where the funding for these research grants has originated, and many of the faculty have received such funding. Our younger inventors very often have received funding from the royalties of older faculty inventors and this fact, when understood, goes a long way to helping those people feel very comfortable with our patent system. They can see how what somebody else has done is helping them, and I think we can reasonably expect to stay with 15% of net income back to the inventor. The fellow who invented the use of diethylstilbesterol in cattle feed received something on the order of one-third of a million dollars for his share. If you have a "big" one, the inventor does very well, but most of the time there is very little or no royalty income received by the inventor.

I strongly recommend a very low key approach in dealing with faculty on patent matters. Be helpful, give them feedback. Understand your own patent system and your university objectives. Understand how you're using the patent

system to the benefit of all and be able to explain it. Remember patents are only a very small part of the whole university complex. You don't do research at the University to generate patentable inventions, but often patentable subject matter comes out of research unexpectedly.

The important thing is to make the faculty a part of the whole patent process, but without making it burdensome. To do that, I believe it is critically important to have a focal point on campus regarding patents that will give a fast response. It can't be somebody that's gone all the time,or that has so many other things to do that when an inventor calls he doesn't get a call back within a day or two. We always try to get right back to the individual and sit down and talk with him whenever that is desirable. Whether you use an outside patent management organization, or have your own patent personnel, there should be someone on campus listed in the phone book under Patents, that any inventor can call and ask for advice, that any inventor can call and get information, that any inventor can call and say, "I've got a hot one for you." Most of the time there won't be one of those big breakthroughs, but you never know. Every once in a while you will get a call that involves an important invention.

It's important to disseminate information on your program other than by word of mouth. One of the things we have found very useful in this regard is a brochure for the faculty that explains the patent system and how it fits in at Iowa State. We hand these out whenever possible, and use them in a variety of ways. We also inserted a statement on consulting, pointing out that the inventor may do consulting under existing university policy, but that the Research Foundation does not become a party to that consulting. We have a similar brochure for

industry entitled, "Inventions from Iowa State" and in that we have a statement that deals with consulting also. Such statements help engender a positive attitude on the part of faculty members.

This morning you heard the results of two surveys on patent costs and royalty income. It's very important that we recognize there should be a lot more to the patent program in the University than the royalty income. The university has a very strong responsibility to help educate its students and faculty on the patent system. These students go out into industry, and all of a sudden, they are confronted by a patent system that is considered to be very important, and they've never heard about it before, unless we teach them. In this regard, one of the things that we do to help our whole patent program work is to give seminars on the patent system to educate and to stimulate faculty and students. We give these to departmental faculty meetings, undergraduate classes, and to graduate students, in which we talk about the patent system in their particular field. In some classes we even give the senior students an assignment of going to the "Patent Office Gazette" in the library and digging out some of the most recent inventions in a field which is of interest to them in their studies. They then write a report as one of the lab assignments. It works very well. You should consider having this seminar capability available relative to patents from your patent office--but don't push it. Have it there, do a good job when you do it, and the word will get around. You will find that you are filling an educational need that's part of the university's responsibility.

We also list patents issued along with other publications in our faculty newsletter, with patents counted as publications. The Vice President of

Research and Dean of the Graduate College also talks to new faculty members during his initial meetings with them on our use of the patent system. As a result, we get a number of them coming to us, asking for more details since the university from which they came probably had a different system or no system.

I would like to comment now on our philosophy and practices in dealing with faculty on patent disclosures and prosecution. Any time somebody contacts us, even though they only have the concept of an invention, we will record that conception as a disclosure. With many of these, nothing further happens, but we find it's the second and third disclosure from an inventor that may be an excellent one. If we can treat the individual well on his first disclosure and don't just say to him, "forget it," he'll come back. It costs us very little to log in a disclosure, but gives us a chance to communicate, to keep up with activity within a given research area, and provides a basis for following up with the inventor at a later date. Another thing we always do when talking to an inventor the first time, is explain to him that there is only a very small chance of any royalty income coming back to him. We tell him that if he is doing it for the money, he is probably wasting his time. Also, when the phone rings and we set up a meeting, we always try to go out to the inventor's lab and meet with him there. This may seem minor, but we believe it can be important. We used to have our offices in an engineering college building, but they were moved to the university administration building! Faculty researchers don't like the concept of a university administration building since they perceive it as putting constraints on their research. In your patent

program you do not want to have researchers thinking you are there to constrain them or take something away from them, so if you can go out to their lab, it works much better.

We always ask for a written disclosure, but try not to get legalistic or overburdensome. In spite of the fact that others are going to talk about disclosure forms, I dislike such forms. Specifically, I believe it is wrong to try to get a faculty member to fill out a form early in the disclosure process when he doesn't understand half of the words and has much other pressing paperwork to do anyway.

When we have a meeting for the first time with an inventor, at the end of the interview we give him some printed material, including a copy of Battelles' "Resource" of May, 1971, in which Bill Mays wrote, "A Primer of U. S. Patent Law." We got permission to reprint this and hand it to the inventor. If he is interested in learning a little bit about the patent system, this is a very useful thing for him to have. We also give him a copy of a patent office publication on inventions and patents. We have found these very good; they help call attention to the fact that there are people at Iowa State that can and will help in patent matters. We also provide a page and a half of typed instructions on how to write a disclosure, emphasizing this is to be used only as a guideline, and that what is needed is to cover the technical points and not to try to be legalistic. These pamphlets and disclosure guidelines help, but what is most important is the copy of the brochure, "ISURF and the Inventor at Iowa State." This latter brochure is widely distributed and even shows up on departmental bulletin boards and in graduate student offices.

It helps get the word around and create a positive climate. We have our phone number on there so they can call us. Then we try to respond quickly.

Once past the disclosure stage and prior to drafting an application, we often obtain preliminary search of the art. We do this to encourage the inventor, and while it may cost us $100 or $150, we always get those results of the preliminary search back to the inventor. We let him keep copies of the patents uncovered so he can see what others have done in his field. That feedback is important. Turndowns can be a problem, because what you're trying to do is create a positive attitude and be the good guy in the white hat. If we have difficulty in deciding whether to continue prosecution of an invention, we send it to an outside attorney for an opinion, which may be a very brief one. We take that opinion back to the inventor and say, "Well, here's the outside opinion. Do you think we should go ahead or do anything more?" Faculty researchers won't ask you to spend more money if it isn't logical to do it. If they keep saying, "Yes, we ought to do it," and we do not agree, we shift into neutral and throw the burden on them to do additional work to prove their point. In that way, it's not us that have failed; it's they that have decided not to do anything further.

We also find attorney interviews are very important and helpful in the final stages of the application. Sometimes it costs a little more, but it certainly does show that inventor that you're interested in him. So, when we have patent attorneys visit the campus (and we're somewhat isolated) we try and schedule as many inventors for interviews in a day as we can.

When the first Patent Office action comes back, the claims are normally all rejected. The inventor has never seen such a form before, and the basis of rejection merely says, "35USC102" or "35USC103." The inventor can become very discouraged. We always sit down and explain the rejection and the different reasons for rejection. Inventors appreciate the explanation. Most of them will take the time to really study the prior art and give you good, substantive answers.

When a patent does issue, try and find some way to recognize the fact and the contribution that has been made. It would be nice to have a certificate made up that the inventor can frame and put on his wall which recognizes his contribution. That would be a nice thing to do, wouldn't cost much, and would help create a positive attitude.

We continue to involve our inventors when it comes to licensing. This is part of communicating with the faculty. You may obtain important leads from the inventor. Fill him in on correspondence about licensing. Keep him involved in the whole process. We try never to get a point where we say, "O.K., Joe, we don't agree. You have assigned this invention to us and we are going to make the decision--we're going to do it our way." If you do that and he is not happy, if you can't explain to him why what you propose is best, you will get some very bad publicity. He won't come back to you with the next invention and others in his department won't come to you. Always try and keep the inventor working with you. Be very open. Take time to explain the system to your faculty. Help them even when they say, "I want to write my own application

and do it myself. Can I do that?" Tell them the facts, and work with them. Pretty soon they'll find out that really isn't the best way to go and they'll come back to you.

In summary, good faculty communications are a critical part of any university patent program. I cannot overemphasize the need for a patent focal point on the campus with a fast response emphasis. Nurse your inventors, be patient with them, and follow up with them. They get more paper work than they want and can easily overlook patent matters. We had a case where we had the final application ready for signing and sent a copy to the inventor for a final review, asking that he come and execute the declaration promptly. We kept calling him every two weeks to find out why he hadn't come over, and he always said, "I'll get to it. I'm very busy." Finally he admitted he had lost his copy. Now, if he'd told us that in the first place, it would have been a lot easier. But things like this happen, and we try never to put blame on the individual. You may kid about it a little bit, but always take a positive approach. Most of all, make sure that your patent system objectives at the university fit with the objectives of your faculty researchers. Build up communications with them over the long term; you can't do it on a short term crash basis. The long term approach of working for them will cause them to work with you and will result in a viable patent program. If you do it with patience, you'll have the whole faculty on your side and your efforts will be successful.

# INTERNAL ADMINISTRATION OF TECHNOLOGY TRANSFER:
# DEVELOPING WELL DEFINED PROCEDURES

Joseph J. Keeley,*
Associate Director
University of Michigan

With the increased attention being paid to the technology transfer programs by those within and by those outside the academic world, it would be just good business for each educational institution to have well-defined procedures that fully delineate the rights and privileges of all concerned. In other words, some standard boiler plate or forms, if you will, that will aid in expediting the transfer of technology from the campus to the market place.

To prepare for this conference, we checked on the patent policies of some twenty-five educational institutions and approximately a dozen industrial firms in the Ann Arbor-Detroit area. We found a wide range of methodology; yet the ultimate objective was always the same; namely, to market the campus ideas in such a manner that will provide recognition and reward to both the institution and to the researcher. Your speaker has taken the levity of using The University of Michigan forms as reference points. Each of you has been furnished a packet, bound in our traditional colors of maize and blue. We may wish to make frequent reference to this material.

The new researcher makes his first decision concerning patent rights on his initial employment application or in a separate "Inventor's Agreement." We found that industrial organizations usually make this agreement an integral part of the employment procedure, whereas only a few of the educational institutions, possibly in an effort to emphasize the seriousness of the subject, use a

*See Appendix B for biographical information

separate Inventor's Agreement Form. In format, we have found that such agreements range from one paragraph in length, to three pages; some included references to the laws applicable to certain Federal agencies; others extended the obligation as much as six months after employment. The briefest form observed consisted of one paragraph with a citation to a university by-law. Others noted the consideration for the agreement, the detailed obligation, and exceptions. After a careful study of the forms, we recommend that the Inventor's Agreement should include at least the following:

A. Full name and Social Security number of the faculty member, or other type employee;

B. Specify that the consideration for the execution of the Agreement is in the employment;

C. That the employee will assign all patentable material developed during this employment to the employer;

D. That the employee will assist in the patent preparation;

E. That the employee will sign all necessary papers to vest title in the institution.

F. Signature of employee and date of agreement.

It should be remembered that the lack of a formal agreement is not fatal. The courts have repeatedly recognized the rights of the employer. However, the lack of an agreement could be costly in the event the inventor should make external contacts or agreements. Formal Inventor's Agreements are required under the various institutional patent agreements of the Federal Government and are always included in our industrial contracts.

The next question is who should execute the Inventor's Agreement? We found that a few of the educational institutions and nearly all the industries incorporated the agreement in the personnel application; hence, there was no selectivity. For those who utilized a separate agreement, there was general concensus that all but clerical, office, and maintenance personnel should execute this form. We follow this procedure. Several thousand agreements are on file. This includes all types of personnel, such as permanent staff, research assistants, students, graduate or undergraduate, teaching faculty, visiting scholars, and consultants. To remind the staff member of his continuing obligation, the following statement is included on the monthly time sheet which is signed by the employee and approved by the project director:

> "With respect to inventions made or discovered by me, or copyrightable material produced by me, in the course of the work upon which I am employed, I agree that my rights shall be controlled by the terms of The University contract or contracts under which I am employed, and I further agree to make such assignments of my rights as are provided in the terms of the said contract or contracts."

We recognize and have provided for that new employee who may have previously filed patent applications and/or disclosures by specifically exempting such items from the new agreement. The format is a letter to the file describing the application or disclosure by the applicant. The project director reviews the material and indicates that he has noted these exemptions and has approved of same by countersigning the memo. This review is made prior to an offer of employment.

In the normal sequence, the next form to be prepared is the Disclosure. This form should include a complete description of the invention, what it does, what it purports to do, identify what is new and list the contract account which provided the research funds. Be brief, length does not necessarily lead to clarity. A word of caution is in order in the use of the word brevity. The initial Disclosure on the Holography Patent was less than one page in length; this included a figure plus approximately 100 words of description. It was duly signed and witnessed by the laboratory director. The best that I could do was to log it in, and to contact the laboratory director for further explanation. This initial patent resulted in a family of patents. To date, over $4,000,000 has been spent in an effort to develop commercial applications for Holography.

Since the courts have held that the unsupported word of the inventor is not adequate proof of the invention, it is essential that the Disclosure be witnessed and dated by one who is familiar with the art and, yet, is not an inventor. The following is recommended:

"Read and understood by me this _____ of _____, _____."
day month year

_____
Signature

During the past two years, we have developed the policy of having the Disclosure recorded under the Preliminary Document Program. We have found that industry is more attentive and responds more quickly when they find that the Disclosure has been so recorded. It is well worth the modest fee of $10.00.

One of the ever-present problems on campus is publication prior to disclosure. We recognize that every researcher has the many talents of editor, photographer and lawyer; that he fully exercises his constitutional rights of free speech, but there is a well-known axiom of patent law, that is, protect yourself before publication. It is essential that the Disclosure be submitted as soon as the idea can be adequately described; faculty and research staff must be constantly reminded of this point. Despite a relatively good public relations program, we still learn through the scientific journals about ideas developed on campus. Certain foreign rights are lost when publication precedes filing. It would certainly be to our financial advantage if we had the opportunity of reviewing each publication. However, this would be an impossible task for us. At one time, we even entertained the idea of sending a representative to the AMA Convention in Atlantic City to see what papers were being presented by our staff.

Concurrent with the completion of the Disclosure Form, we ask the inventor to complete a Record of Invention. This form provides a chronological record of tests, witnesses, reference to laboratory notebooks, drawings and publications. We have found that this form usually provides all the necessary data for the Patent Committee and the Attorneys Office to take appropriate action.

The next form to be completed is the Assignment. This form is used to transfer the inventor's rights to the employer. It should consist of the following:

A. Name and address of the inventor.

B. Full title of the invention, the serial number or the patent number if appropriate.

C. Cite the consideration for the Agreement ($1.00) and such language as "Sell, assign, and transfer unto said . . . . . the full and exclusive right to the said inventor or application . . . . . and to any and all Letters Patent which may be granted . . . . ."

D. Inventor authorizes and requests that the Commissioner of Patents issue said Letter of Patent to the employer.

E. The completed form is notarized and forwarded to the Commissioner of Patents to be recorded. A copy of the Assignment is returned with appropriate notification as to Reel and Frame.

At the University of Michigan, we have developed over the years a generally acceptable one-page Assignment. This resulted from the combined efforts of The University and our industrial sponsors.

Assuming that the idea has commercial potential, the next order of business would be the preparation of a license. It has been our experience that each license must be accorded individual attention; there is little standard boiler plate. The license is a very critical instrument; close attention must be paid to each detail; protect yourself at all times; anticipate possible areas of misunderstanding. A license could be a great asset or it could be a bust. You can expect considerable negotiation with each prospective licensee. The license may be very simple, or very complex; it may spell special usages, advanced considerations, geographical limitations, royalty schedules, quality control, cancellation for non-performance, etc.

I would like to cite a product that some of you may have seen last night on T.V.; namely, the "Safety in Sports" special, which featured the new football helmet developed by Dr. Richard Schneider, Head of Michigan's Neurosurgery Department. For ten years Dr. Schneider headed the Football Fatality Committee for the NCAA. Despite a full class schedule, surgery, guidance of graduate students, etc., he still found time to improve the protective qualities of a football helmet. The helmet is now being field-tested. We have included a copy of the actual license in our packet, and the following should be noted:

A. That the headgear and/or helmet is limited to certain sports such as football, hockey and boxing; it does not include industrial safety -- that will be the subject of another license.

B. The different royalty schedule of 5% for football and hockey helmets, and 2% for other sports.

C. Advanced payment of $60,000 for executing the license.

D. Assurance of productivity; that is, if the licensee does not actively pursue the manufacture of the item, the license will be cancelled. This is a most important provision.

In addition to the forms that were previously mentioned, we have also included copies of our contract forms, and other material that may be helpful. The prime consideration for our participation in this Conference was the opportunity to exchange information. You may call it "quid pro quo," or reciprocity, or any other expression which means that we share our talents. I trust that my few words, plus the packet of information will be of some value to you. Any similar material developed by you would be welcomed.

# INTERNAL ADMINISTRATION OF TECHNOLOGY TRANSFER: EVALUATING TECHNOLOGY AND FILING PATENTS

Lawrence Gilbert,*
Director of Patent Administration
Massachusetts Institute of Technology

Two topics of major importance to the internal administration process are the evaluation of the worth of your technology and the process of actually filing a patent application. I will begin with the evaluation process.

In-house evaluation. The use of faculty committees or outside committees for evaluating technology for the purpose of whether or not to file patent applications should be avoided like the plague. Nobody knows what inventions will make it to the market place. Hence, a few guidelines plus common sense should suffice to enable a Patent Administrator to make a decision to file or not to file. Decisions to file should be based on the technological merit, the market potential and the patent status. An evaluation is more suited to a Patent Administrator. Committees should concern themselves with policies not operations.

What are the guidelines? First of all, inventions covering products, devices, systems, instruments, and chemical compounds should be sought out, identified and a decision to file made on the above-described basis, especially, processes and products that comply with new government regulations, and products that address themselves to the consumer market.

Since a limited-market potential is the prime factor in shooting down an otherwise good invention more will be said about that later.

*See Appendix B for biographical information

Inventions dealing with circuits, components, improvements to instruments and inventions that will result in merely a paper patent should be avoided.

Within this framework the Patent Administrator must adopt what I refer to as the "shotgun approach." You spray your filings in the general direction of the market place and hope that 10%, maybe 20% of those get there.

Evaluation by outside firms. The use of specialty firms such as those that have sponsored this Forum to evaluate the worth of technology can be effective, if properly utilized. However, it is my general feeling that more often than not the Patent Administrator has already decided not to file and merely wants a confirmation of that fact in writing from the specialty firm, hereafter called XYZ Corp. The Administrator can then tell his inventor "We would like to file for you but XYZ Corp. turned us down and here is a copy of their letter." It should not be surprising then to discover that the XYZ Corp.'s rejection rate is very high. It is a case of junk in, junk out. I have heard more than one University Patent Administrator complain that the XYZ Corp. wasn't providing any service. To quote one, "No point in sending a disclosure to them, they won't file anyway." In considering the rate of disclosure vs. the rate of filing by XYZ Corp., perhaps the University Patent Administrator should reevaluate his techniques internally in locating quality disclosures by opening up and fostering channels of communication with key departments; specifically those which have the greatest potential for developing new marketable technology, such as, medicine, agriculture, chemistry, biochemistry, chemical engineering and the like. Companies selling products in these areas are

used to the licensing process. They understand the nature and the process of embryonic technology which is the hallmark of the university invention and are willing to take the high risk necessary to bring the invention to the market place.

Periodic group meetings with these departments can serve to remove the mystery about patents, the relationship of a publication to a U.S. filing, to a foreign filing, disclosure requirements, and claiming. More of that later. The faculty from these departments might be surprised at some of the benefits that can be obtained from patent filings; for example, industrial support, visiting scientists associated with that support, university-industry exchange of ideas, product or prototype development of an invention, consulting, a license agreement or an option and royalty sharing. For example, at MIT we are in the final stages of an agreement with a Japanese pharmaceutical company that will provide for a joint development program to be conducted at MIT for a minimum of two years at a cost of approximately a quarter of a million dollars in order to find commercially significant antibiotic compounds. Now six of the seven of those preceding described benefits we will obtain in this case. Such a joint development is necessary because the compounds exhibit activity but not commercial activity. To find commercially significant compounds is another matter and our inventor estimates that it will take a minimum of two, perhaps three or four years to find them. Without a development program you have a very interesting invention, but one that would never get off the ground.

If you don't know much about patents and hence don't feel qualified to conduct group meetings with your departments, you can always find a local

patent attorney that would be happy to step in for you and explain the vagaries of the patent system.

To return to our hypothetical specialty firm, XYZ Corp., it can serve to identify the commercial potential of the invention and take reasonable risks to attempt to bring it to the market place, but it can't "make a silk purse out of a sow's ear." It is also my opinion that XYZ Corp. should meet the situation at least halfway by initiating programs at the university that will generate more quality disclosures.

To sum up, if you desire assistance from an XYZ Corp., to have any chance of success in terms of royalty return, you must develop internal channels of communication with your faculty.

Determining the size of the marketplace. Many inventions are meritorious, they fill a need, they work well, and have advantages over prior art devices. Yet often no one is interested in developing commercial prototypes. What's wrong? A couple of recent examples may serve to illustrate.

MIT in association with the Mass. General Hospital developed an infant mask respirator useful as a diagnostic tool in determining whether an infant brought into a hospital and unable to breathe properly is suffering from a heart or a lung condition. If the problem is in the lung the mask could be further utilized as a means of assisting the infant in breathing. MIT filed a patent application on the device and a patent recently issued. Several masks were made and successfully demonstrated in Boston area hospitals. I brought in or contacted several companies, none of which went beyond the initial evaluation stage because all of

the companies did not perceive a big enough market. Good inventions aren't necessarily commercially successful and commercially successful devices aren't necessarily innovative. The story is always told in the market place.

A second example is a recent invention brought to my attention by another university. It is simple and effective; a blood warming device. In this case no patent application has been filed which makes it difficult to supply the necessary information required to generate within a company a champion or someone with clout who has the capability of motivating his company to bring the invention to the market place. It is commonplace for many universities in such a situation to require so-called secrecy agreements. But is that wise or necessary? I don't believe in the efficacy of secrecy agreements and do not advocate use of them. In the first place, such an agreement is in conflict with the usual open-door university policy. Secondly, most companies are unwilling to talk to you unless it's on a non-confidential basis. Thirdly, a university rarely has know-how so must rely solely on its patent rights. Accordingly, if the invention has good market potential you file. If it doesn't, you don't. If the potential is unclear, you probably shouldn't file. What you can do in such a case and what I did in the case of the blood warming device was to contact a company in the field that I knew and that would be willing to evaluate the market potential of the device. I told them what the device was and what it did (but not how it worked). It was not a disclosure in the legal or the technical sense. Very little data was given. In fact a technical disclosure was not given to me. In this case the company perceived only a limited market and has promised to send me a brief report to that effect which I shall pass on.

The point is that no secrecy agreement was required to get a company to make an evaluation. Such an invention is more difficult to promote and it helps to have a contact or a track record. If the company's evaluation were positive, you could negotiate with the company to pay a third party patent attorney, acceptable to both, to file the application in return for the full disclosure, and grant to the company a right of first refusal to the rights to the invention. There is an obvious danger in allowing the company's patent attorney to file your U.S. application on your behalf.

Filing for a patent. The best way to protect the university's patent rights is by filing a patent application. A disclosure that contains the inventor's idea in the form of a preferred embodiment, that is, the idea illustrated by a specific example of how the idea works, can be constructively reduced to practice by filing a patent application. It is not necessary actually to make the prototype. Actual reduction to practice becomes important in the case of an interference to determine the first to invent. Of course if the idea doesn't work, the patent application or patent may fail for lack of operativeness.

Nature of the patent application. A patent application contains primarily a specification which must disclose the invention in sufficient technical detail so as to enable one having ordinary skill in the art to practice the teachings of the invention and claims which define the area of protection that the patent provides with respect to potential infringers. The patent rights, as defined by the claims, do not give the patentee the right to practice his invention, a right he has always had, but rather the right to exclude others from so practicing.

The teachings as disclosed in the patent become prior art to all who come later in time, thereby preventing anyone else from getting claims to whatever the patent teaches. In that sense, the application when it issues as a patent serves as a publication. In contrast, a U.S. Patent Application is held in confidence as long as it remains an application.

Timing of the Patent Application. There are grace periods with respect to the filing of an application. A one year rule obtains in the U.S. This means that the Patentee has up to one year from the date of a publication to file an application in the U.S. A publication can be described as a written document available to the general public as opposed to a document generally available. Accordingly, a single document in a university library that makes it available to the general public is a publication while a large number of distributed documents that are generally available may not be.

For example, a distributed bachelor's thesis in the Department of Mechanical Engineering is available to all students and faculty in the department and the university but an outsider would require a need to know. Hence, the thesis is generally available to students and faculty of the university but not available to the general public.

Except in those countries that have grace periods, a publication anywhere in the world becomes a bar to filing a U.S. Patent Application in foreign countries. However, if a U.S. Patent Application is filed prior to a publication anywhere in the world, the Patentee has one year from the date of the filing in which to file in any other country. This is called a convention filing and applies to all countries that are signatories to the convention.

One final point. Most European countries and also Japan will lay open a Patent Application, (that is, make it available) that was filed in that country 18 months after the filing in the country of origin. For example, a U.S. Application filed in October, 1974, subsequently filed in Japan October, 1975 is layed open in Japan in April, 1975, and yet the application originally filed in the U.S. is kept confidential by the U.S. Patent Office unless already issued. As a result, many companies today learn of U.S. developments (and yours) by keeping tabs on applications made available under the 18 month rule.

Use of outside attorneys or firms to file patent applications. I would like to conclude by touching on the topic of the use of outside attorneys or firms who file patent applications. As has been discussed before, most universities exclusively use outside local patent attorneys and it is clear they can offer some distinct advantages, for example, lower cost of filing as opposed to an in-house counsel. And what are these costs? It costs between $1,000 to $2,000 to file the average U.S. application. Foreign filing can add from $400 to $500 to file in Canada, to approximately $1,000 in a country such as West Germany. To run an internal program will require a minimum of 10 to 15 U.S. Patent Applications per year or about $20,000 to $30,000 a year. With that rate of filing you can expect that it would probably take somewhere in the vicinity of five to ten years to break even.

The other obvious advantage in having outside counsel has also been mentioned previously. It's the face to face communication between the patent attorney and your faculty which not only provides for a better drafted application, but it also allows the faculty an increased opportunity to gain an

understanding of the patent system.

Summary. In summary, the best advice that I can give to a university patent administrator is to develop and improve his channels of communication not only internally but also externally.

Note. Due to a lack of time there was no discussion following this panel.

# MECHANISMS FOR TECHNOLOGY TRANSFER: THE ELEMENTS OF A GOOD LICENSE AGREEMENT

Clark A. McCartney, *
Director and Patent Administrator,
Government Contracts and Grants,
University of Southern California

There are, in every case, standard elements for a License Agreement. As you have just heard from Joe Keeley of the University of Michigan, License Agreements are developed from the specific situation of the invention, your requirements, and those of the Licensee with whom you are dealing. However, I will attempt to discuss some parts of a License Agreement that should be considered. In the instance of my institution, whether it is the best route to take or not, we have become directly involved with negotiating License Agreements. We include in our negotiations a team of three persons: that is, the Inventor; the Patent Administrator, who acts as the Business Negotiator and Final Arbitrator on license terms for the University, and the Legal Counsel for the University. We find that this is an effective team mechanism for arriving at the best negotiated License Agreement for the University and the licensee to accept. I suppose such a mechanism is also a way of ducking some responsibility. If down the line several years you find out that you have negotiated a dud and you gave away the store, you can point to the other two negotiators! There is always a horrendous problem when negotiating a License Agreement, as one asks himself: "Should I have included this term? Was the appropriate schedule of payments sufficient, etc?"

We've had a discussion earlier at this meeting in regard to the economic side of the invention picture and an inventor's academic incentive to publish

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* See Appendix B for biographical information.

his or her research. It is a difficult problem as to the involvement of an inventor in the license negotiations. Many inventors, especially in the medical profession, will want to walk out the door when you start talking money. Many times, inventors will insist on restrictions to themselves as to their royalty distribution agreement with the University, with or without an Institutional Patent Agreement. If we are dealing with a federal agency, that has granted the university a waiver of government ownership based upon our request for greater rights, there is a conditional requirement to serve the public interest by marketing of the invention at a reasonable cost. Usually, the vehicle for bringing the invention to public interest is through a license with terms that will allow a licensee to market an invention satisfactorily with conditions to his proprietary interests and available investment capital. You are constantly concerned that you are acting not only to protect and provide for the interest of your faculty member and his ethical and professional interests, but also your institution's interests through the Board of Trustees, as well as the interests of the Federal Government.

Usually, the decision has been made before license negotiations as to filing a patent application. There are instances, and we could take quite a good deal of time just discussing the issue, of when to start license negotiations, that is, before, during or after filing an application or issuance of a patent. The discussion about a Licensing Agreement presumably occurs after it has been narrowed down to one potential licensee. Is this decision based upon a derived exclusive arrangement? Have you made that decision? Are you still dealing with one, two or three different potential licensees. You have to make the decision, whether you are going to go non-exclusive because

of the nature of the invention or are you going to go exclusive. How do you determine the best licensee for an exclusive agreement? This determination should be preparatory to the negotiation of actual terms of an agreement with the selected licensee.

Many times in the terms of the agreement you have certain conditions required by your sponsors that must be included in the license, either at the Federal Government's or the private sponsor's insistence. I am not here to give you a lecture on Contract Law and I can't stand here and tell you what the terms should be in every License Agreement. However, there are certain license terms and conditions that I can discuss with you that you should consider. As a matter of course, every attorney in preparation of a License Agreement will include specifically who the parties are in the preamble. Definitions in a License Agreement are very important and such definitions should be well thought out in detail with reference to the invention itself. A discussion of exclusivity or non-exclusivity, assuming that you have reached a decision, will of course be discussed in the agreement. In the agreement for exclusivity, we have found that many of our agreements, including know-how provisions, have been fortuitous, especially in the case of a pending patent application where it might be on the weak side and the patent does not issue. We make sure that included with know-how provisions there is a percentage split of payments. A fall back is a good description of this provision. I have examples for you if you would like to review how the clause is written. The know-how clause, of course, defines in the agreement itself precisely what is meant by "know how". As Lee Stam said this morning, it is difficult to convince a licensee to accept any percentage part of the payment schedule

for know-how if the patent application is not issued and there is a good deal of publication. Remember, you are in a negotiating situation for the invention and the license you are dealing with.

In the case of an invention that involves manufacture and product distribution, a statement on the delivery should be included. Inclusion of a statements' clause is very important for any royalty type of agreement so that your licensee is required to provide statements on a regular basis (monthly, semi-annually, quarterly or whatever) of the number of manufactured articles, etc. Books of account are normally required to be in the agreement in order that you can go back to an auditable entry into the licensee's books to make sure that there is a creditable reporting relationship between you and the licensee. By including this term, a books of accounts clause, in the agreement, you provide for a credibility factor that cannot be ignored by the licensee. The payment provisions many times have many variables in the provisions according to the strength of your invention. Royalties themselves can be fixed rates over the period of the life of the agreement. There can be sliding scales with offsets to start up costs for the first year, as production increases there can be sliding scales for royalties. Royalties are business negotiations that require a good deal of effort. Many times marketing information that the licensee provides, substitutes for information that you don't have yourself in order to come up with an agreeable royalty rate.

"Front end consideration" in entering into the license agreement, is often a way of guaranteeing that you recover at least the costs of putting a license agreement together. If you have a strong enough invention, many

times you can obtain this front end consideration in the agreement. As a matter of fact, I can recall one agreement we recently neogitated where we received a nice healthy front end consideration of $90,000 and the licensee proceeded to exercise his termination privileges under the license agreement for his own good reasons. We are going to a second licensee now that the first one is out of the picture. The first licensee had some political problems within their organization as to whether they wanted to introduce a new product and unfortunately they didn't make the decision soon enough.

A minimum royalty is another consideration in the payment clause. It provides for guaranteed performance on the part of your licensee. This clause is not as readily accepted by many licensees because it holds them to a minimum investment in the license agreement. If you don't have front end consideration, I would certainly recommend minimum royalties, the first year and/or the second year in your agreement. This also provides some consideration, and shall I say, support for the agreement you have reached in explaining it to your Board of Trustees and Administration if they ask "What are you going to get out of this? What is the value of the contract?" Your answer can be "I don't know how many things they are going to produce or how long they're going to be successful in keeping the product from being engineering around by someone else, but at least I can show you this, that I have minimum royalties guaranteed."

Proceeding from the payment area, a clause regarding sales to the Government (U.S., state and local governments) must be considered. As

you are aware, the conditions of our sponsored agreements for grants and contracts with the government provide a minimum royalty free license rights to the government. You must make sure that this requirement is fully enunciated in your license agreement as to what rights the government has for sale of the product. If you can receive back from your government agency a right to sell through your licensee to state and local governments including a royalty rate, that's fine, otherwise, you have the definite requirement that the sale by the licensee to the government cannot include royalty payments.

I'll mention a few other legal areas that are not particularly business oriented in the agreement, but must be considered. One is a sub-license clause with a requirement for separate statements and books of account for each sub-licensee with approval by the licensor. Another regards infringement of the potential invention -- who pays for a lawsuit and who prosecutes? We have obtained some very interesting agreements in this area where if the licensee wishes to prosecute, they agree to pay or they may wish to offset against the royalty payments during the period of an infringement suit. In such a way we can escape the obligation on our part to pay for the costs of the infringement suit. However, it is said the best way to fight an infringement is to license the infringer.

Consider including an improvements clause. The most beneficial improvements clause if the licensee makes improvements to the invention is to file an add-on application in the name of the licensor with available exclusive rights to the licensee. And, in reverse, if you have improvements on which you file an application, then the licensee receives rights under the terms of

your original license agreement.

In Foreign Patents Application, we are not in a position to go off fishing and pay foreign filing fees. We just don't have sufficient market information to do this and to justify the University filing all over the world. So we normally provide a clause that the payment of foreign filing fees by the licensees on our behalf will again be offset for royalties paid for manufacture and sale of the items in the country involved. This generally is an acceptable clause.

Three more clauses are a termination clause which is very important, material breach, and default by the licensee. This is the type of legal consideration that should be included in your agreement by all means. We try to obtain a consideration as to whether the licensee desires to terminate through an appropriate notice. Again, here's another area of protection you can obtain. The licensee must provide X number of days notice and pay a consideration for the termination. Believe it or not, we have included such a clause in several agreements. The renegotiation clause is usually included if the rights of the government materially affect the licensee's rights. This is normally insisted upon by the licensee himself. Remember an Assignment Clause. Especially in the area of medical devices, insist on the right of inspection and quality control rights on your part. We normally assign the inventor(s) as consultants directly to the licensee for this purpose. Other elements of a license agreement include a No Waiver for Several-ability Clause as well as a Legal Notice Clause. A Due Diligence Clause is another clause to be included in an agreement. The discussion today on the football license agreement was very helpful.

# MECHANISMS FOR TECHNOLOGY TRANSFER: MARKETING UNIVERSITY TECHNOLOGY

Niels J. Reimers,*
Manager, Technology Licensing,
Stanford University

After a short introduction, I plan to present what I hope to talk about in outline form, hitting the main topics and then in the question and answer session which we hope to have, I trust you will ask questions. It's going to be a nuts and bolts approach. I think the best learning comes from interchange of the audience with the speaker.

Edison once observed that bringing an invention to a product was 1% inspiration and 99% perspiration. I recommend that any of you planning to undertake the marketing of University "Inspirations" read about Edison, and find out just what happened from the time that very first light bulb went on until the perspiration produced the product.

Notwithstanding Ralph Nader (nee' Public Citizen) and the Antitrust Division of the Justice Department you will find that your invention or patent is not a monopoly, with rapacious companies eager to sign licenses with you in order to exploit the public, and I quote from Public Citizen vs. U.S., "All of the plaintiffs and contributors to Public Citizen are harmed as taxpayers and consumers because the patents and inventions have been developed at the taxpayers' expense either by Federal Agencies or with Federal funds and the regulations provide for the issuance of exclusive licenses. A recipient of an exclusive license will acquire a monopoly with a concomitant effect on prices causing plaintiffs and supporters of Public Citizen as consumers to pay again for an invention which they have already paid for as a taxpayer."

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* See Appendix B for biographical information.

That is really simplistic!

Should Mr. Nader and the Justice Antitrusters prevail with Public Citizen suits and their efforts in Congress, principally now with ERDA legislation, this could be the first and last conference of this sort and the U.S. public would be the loser. And I don't mean because of lost licensing income to Universities, which income would otherwise reduce the cost of education. I mean the loss of research advancements into commerce which could be providing jobs, increasing productivity, enabling better health care, helping our international trade position by competing with new technology to offset our high labor costs, and so on.

Show me the situation where a University has developed an invention to the point where it can be first licensed non-exclusively, and I'll show you a company masquerading as a University. This is an exaggeration, of course, because there will be situations where a combination of circumstances will enable non-exclusive licenses without an initial exclusive period. I think it is important to be aware of the fact, however, as many speakers have mentioned today, that generally you have to first license exclusively because your invention is very raw and only an exclusive position will encourage the necessary expenditure of private risk capital.

Now we are at the nuts and bolts part of this. What we do at Stanford, I do not necessarily advocate for all universities. We all tend to operate quite differently. Also, there is no typical case as each invention is quite different.

Another important point to realize is that the entrepreneurial emphasis

is all-important. Licensing undeveloped technology is not an objective process. It's quite a subjective process. You don't simply list your invention for sale and have companies trotting around to buy it.

Also, I would like to reemphasize something that Roger Ditzel mentioned earlier today -- don't use a Committee. It is really a one-on-one relationship of you with your inventor, and you with the companies, I feel that is the best way to market technology. You are the one that has to decide whether or not to file.

Yet anotner important ingredient is timeliness. Inventions are very perishable. You've got to move out, and move out fast. You often have very little time because of publication by your faculty members. But more important is that most technology has only a short technological life. You have to ride that initial wave of enthusiasm. By the time the patent is issued it is generally too late. In my observation, your chance of licensing is inversely proportional to the amount of time the invention has been known.

Following are the main topics that I hope to cover in outline form, but if we don't before my 15 minutes run out, they can be covered during the question and answer period. They are Evaluation, Identification of Prospective Licensees, Approaching Companies, Licensing Strategy and finally, Closing the Deal.

Evaluation. I realize that earlier today you have heard how others evaluate inventions. That's actually the beginning of the marketing process at Stanford and it is critical to eventually licensing the invention. The first step, when the invention is disclosed, is to talk with the inventor and understand the invention. I realize inventions come from all technologies

and while you certainly can't be expected to have a total grasp of all technologies, at least find out what is different about the invention. Why does the inventor feel it marketable?

You can also consult technical peers of the inventor. I don't do this too often. At the University of California, as Mark Owens mentioned earlier, they do use faculty who are technical peers of the inventor.

You can also use literature, market research reports, your business school library (if you have a business school), and trade journals. I don't usually do patent searches. I don't think it's productive in most cases. When I do run a patent search, it's generally not for purposes of evaluation. It is for other reasons.

The real key in your evaluation process is contacting companies. Contacting companies will bring me into the next topic which is the identification of Licensees. It's in your early contact with companies that you really find out whether your invention is worth anything or not. They are the ones who have to deal in the market place.

In your evaluation, you also of course need to look at whether an invention is patentable or not. You may, or may not, call in a patent attorney. As you get further and further into this you will find that you have developed a reasonable amount of skill in determining whether or not something appears to be patentable.

Identification of Licensees. Now once you've got the invention preliminarily evaluated, and you've decided it is something you want to pursue a little bit further, which companies will you contact? The key is a company

that has access to the market where your product will be sold. It is not necessarily the company that presently has the appropriate technological capabilities. The key again is whether he has market access. If it is a product that is going to be used in anesthesia, does he have salesmen calling on departments of anesthesia in hospitals. It is nice if you could have both the market and technology match, but the most important factor again: does your prospective licensee have market access?

Ask your inventor. He will often know the companies in the field of his invention. Use technical journals and trade journals. Use the Thomas Register as mentioned by an earlier speaker. It is used by buyers. If they want to buy some rope, they look up "rope" and see all the companies that are engaged in selling rope. Or use "Standard & Poor's", "Dun & Bradstreet", "Moody's", "Buyers' Guides", and, on the West Coast, for electronic manufacturers, the "Western Electronic Manufacturers Association Journal" which I find is very helpful.

In focusing more closely on the companies, you will find it useful to determine sales volume figures. If it shows a relatively small company that also tells you what level you're going to reach within the company. Also, during this stage of identifying the company, obtain the names of the chief officers of the company. This can be easily done through "D & B", for example. Who do you contact in the company? That's a judgment call and takes me to the next topic.

Approaching the Company. What do you have to offer? Is your inventor willing to consult? What is your proprietary position? Is there a possibility

of benefits from future research to your licensee? Do you have a bench model of the invention? What kind of data do you have? Do you have something to see or demonstrate?

If your invention is very important and would thus be very significant to a company, call the president of the company, contact him personally by telephone, or in person. I don't think that a letter is the best way to first approach a company.

You have to look into the dynamics of their decision making process. They generally live on their in-and-out-baskets and meetings. Why should they look at something from the outside? You have to find a product champion within the company who is going to carry your ball for you within the company. It is very important that you select the right person. In some cases the marketing manager is the wrong guy to contact. He can't get enough out of his basic research people. The research manager may be the wrong person to contact. He only has a limited amount of funds, and he would like to support his own projects rather than something coming from elsewhere. You have to find the product champion within the company.

In going out after companies and making your contacts, I find it is necessary to do it in waves. You might initially contact one, two, three, four companies. Again, that's a judgment call. A key element that you have to consider is how much time have you got? We receive about six inventions a month and I have about 130 or so projects to follow. You just don't have time to survey the industry. And that's not the way to sell technology either.

After you have made your personal contact with the company, you invite

them to visit. Send a follow up letter and then follow up the letter. Put it on your calendar for a week, two weeks ahead. You might indicate in your letter that "I'll plan to be calling you in a couple of weeks to learn of your reaction". Then he has to be sure to follow up so that he is ready for your call.

It's not at all obvious how you select different companies. There are some companies that set up such barriers to get through that you will find you just won't deal with them after a period of time. With some companies, the dynamics of interaction with them are such that you never know why they did not like your invention. I find the best companies are those where I can easily telephone a person within a company, and can have a meaningful interaction with him. In very short order, (and I am talking about a week or so, or less) he'll call back and tell me, "We're not interested for these reasons". Or, "We are interested, send us more information", and so on. It is just as important for you to be able to learn of the inventions that you will discard as those you are going to take on. Again, this is part of our evaluation process. We keep our inventors closely informed throughout the licensing process.

Licensing Strategy. Exclusive? Non-exclusive? Option agreement, then license? How important is the invention? How much time can you devote to it?

Do market research. I have a business school student who works full time for me during the summer, part time for the rest of the year. I also make available projects for business school students for course requirements with good results.

Should you file a patent application before you begin to negotiate or not? What material do you send to the company? Secrecy agreements, non-confidential agreements, media; we'll talk about that some other time.

Closing the Deal. You have got to ride that initial wave of enthusiasm. You will find it is very hard to resurrect x months later. It bears repeating again that university technology is very perishable. You want to move forward promptly while there is interest, while it has just been published in the Journal of Applied Physics and the technical community is still excited about it, to drive quickly to obtain an agreement and then move on to your next invention.

What are you going to charge? There are a great number of factors involved there. What is the extent of interest of the potential licensees? Is one company the "only game in town"? Do you have two, three, four knocking at your door? The size of the market. Is the world market only ten? Is it an enormous market? Is it totally a new item? Is it a new process? Is it just an improvement? What is the stage of development? How much work is the licensee going to put forward to bring it to a product for the public? All of these you have to consider in "closing the deal".

The preceding is the outline of what I hope to talk to you about which I hope may stimulate questions.

I would like to insert one comment based on what I have heard earlier today - the Government doesn't invent, the University doesn't invent, people invent. The faculty is there to teach, not to invent. I don't necessarily

agree with those who say because he's there, because you're paying his salary, you own his intellectual output. Our program is optional.

Perhaps in the question and answer sessions later we can talk about software licenses and know-how licenses.

# MECHANISMS FOR TECHNOLOGY TRANSFER: HOW UTAH SELLS ITS INVENTIONS

C. W. Martin,*
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Before I start I want to indicate that there are some pamphlets and papers up here at the front. Please feel free to help yourself. One is a little pamphlet on "What to do in Case of Invention" which is directed to professors and research workers to let them know we weren't going to steal their eye teeth. The second one is a "Guide to Preparation of a Disclosure". Actually, I don't recommend that you follow it to the letter since it's a flexible thing. If a disclosure satisfies the requirements of an engineering notebook it is satisfactory. The next pamphlet is a foreign application handbook. I came from private industry and we discovered that it was a lot cheaper for one to prosecute his own foreign patent applications directly with the foreign attorneys or agents rather than to go through the international houses in the U.S. This pamphlet tells how to do it. If you need a list of good patent associates in foreign countries, I'll be happy to help you there. The next one is a copy of the University of Utah faculty manual which sets forth the patent policy. Here's one on the research notebook and how to keep it. We prepare special notebooks. They are bound editions with a lot of gold printing on them and we provide these for the inventors to keep records between the time of their conception until the reduction to practice. The next one is entitled "Patents, Inventions, Copyrights", a kind of catch-all. The last one is a story on what our Engineering Experiment station is doing to help industry, both inside Utah and out, in applied research. These are here and available for you.

* See Appendix B for biographical information.

One advantage of being the next to the last speaker is that you have been shot down in flames, all your stories have been told, and everyone has hit all the hot points that you had noted in your prepared speech, so I am going to zero in on only a couple of points. I am going to tell you how to find the man in the industry to whom you are going to sell your invention. I will also touch on a few other points as I go along.

Earlier we mentioned how to generate the submission of disclosures. The way we do it at the University of Utah is that we have the brown bag luncheon. I get in touch with the deans of the various colleges, set up appointments and go over there during their lunch hour. There may be only five men or there may be fifty. I then introduce the subject of patents and why we have a patent program, what it means to them, and what it means to the University. This method has been most successful.

Now let's assume that all these good things have happened that we've heard here today. Your university has granted you enough money on July 1st for another year, and you have a patent program whereby everyone in the university has signed an assignment to you. You don't have to worry about that. You have the disclosure program set up and you are sitting in your office fat and sassy waiting for the first man to come in. You are full of confidence, you know you can sell his invention; either that or you're going to work through one of the companies that will sell it for you. You know that you've got information from a prospective patentee who is going to tell you who you can sell it to. You may get this information out of the Thomas Register. You may even get it - and I don't think this has been mentioned before - from the patentability search. The search indicates other companies that are interested in this field of endeavor. It isn't

always fruitful, but it might be helpful. So you are sitting there. It's all pat. You don't have to worry about a thing. In walks the tooth fairy. Now, he says, "Look what I've got here." 'What have you got?' I ask. 'Well,' he replies, 'I've got purple and pink and green carbides here and they are made out of the petunia pollen.' And I say, 'Well now fine, tell me about it.' and it turns out that it's not as silly as it sounds. Of course, this is a ridiculous example but what follows might really happen.

Into my office came a very learned professor who had decided to make silicon carbide out of rice hulls. Now there are no rice hulls in Utah and I asked " 'Why are you going to make silicon carbide out of rice hulls.' He said, 'Well, I wanted silicon carbide in the first place. There is a shortage of it due to the energy shortage in Niagara Falls, and it's not being produced there and what is being produced is in huge hunks, and has to be reduced in the ball mill. The silicon carbide wrecks the ball mill anyway, so I want to make it in submicron sizes. I found out that the best source of this silicon carbide was in rice hulls.' 'So,' I said, 'fine--now what are we going to do with it?' 'Well,' he said, 'there is a big market for silicon carbide in reducing used automobiles, wrecked automobiles and scrap metal into steel.' " We looked into it, and he had a reduction to practice. Our records were up to date and we were ready to go, so we filed a patent application.

Next, I want to tell you the ideal person you should go to in an industry to sell your invention. You ought to go to the top salesman in the organization. We had a president at Marchant Calculators at one time who was an ex-salesman and he was the best man to approach with a new idea because he sold himself. A salesman gets caught up in your pitch, and he is associated with it. He

starts nodding his head and going along with you, and pretty soon he is sold himself. He is even offering a few pointers you hadn't thought of. So, find the salesman in the company because he always wants the new product yesterday. Now, if the President is a salesman, so much the better.

Now let me tell you who to avoid. Avoid the finance men because they are going to amortize the invention, they are going to work it out on their books and they will squeeze blood out of a turnip and they won't listen. Second, avoid the company patent attorneys because they are going to want to figure out a way to design around it. Avoid the engineers because they think they can design it better. As an example of that, Mr. Carlson the inventor of the famous Xerox copying machine, came to Marchant Calculators years ago. He said, "Hey, I have a hot way to copy," and our engineer, so help me, said, "I can do it better." Obviously he didn't.

Okay now you know to go to the top salesman in the organization. And how do you find this man? Well, you've had a hint today. Pick up the telephone and ask for the president's secretary. Ask her a few questions. Secretaries are very talkative. Just tell her what your problem is. Pull her into it. Make her a part of your problem. They like this sort of thing and the chances are she will pin point your man. Now you make a contact with him. Okay, what do you need? If you've got a model, by all means take it along. There isn't a man in the world that can resist punching keys on a calculator, twirling the platen on a new typewriter, or the like. Give him something to work with. Let him sell it to himself. It works and that's the way you sell it.

Next, I want to touch on the matter of using outside sales help. I don't

think it's had fair treatment here. Should you set up an inhouse organization or should you work through Battelle, Research Corporation, or the Dvorkovitz group? These organizations complement the universities. Use them. Now, some of you are here from universities, without an existing patent organization. An easy way to do it is to use one of these companies in starting out. You know you are going to have to have a man on campus anyway to make your government reports. So you can take that amount, say that he is devoting $10,000, of his time a year to doing this work. You've got him anyway. That's $10,000 you don't have to account for, but if you are going to run a decent patent department, one man, one girl, and pay outside attorneys, believe me it's going to cost you $50,000 a year if you have got any activity at all. Why not go to Research Corporation or to Dvorkovitz or Battelle or whomever, and enlist their aid. Try them out. Once you get over the $40,000 royalty income mark and you are assured of getting it every year, then if you want to get your feet wet, go ahead and form your own patent department. But you will find out you still are going to want to use these fellows. I suggest that this is one way for you to get started with a patent department and do it cheaply. Whether or not you should switch over later you'll get some argument from these companies, but for what it's worth there it is.

Now, I might as well go ahead and get my feet wet and jump into this argument about know-how. I could feel the bristles rising during the earlier discussions about know-how and it really doesn't mean a lot. But as one suggestion, a gentleman from Germany told me that since the EEC regulations were enforced, if you license in one country, you must license in all of them. He said, "I'm from Germany and I want to sell drugs in Germany. I don't want to sell in France."

He says, "It's a problem. I don't want a competitor there." He said, "Let me have it in the form of know-how." A word to the wise is sufficient on that one I think.

Now, we're getting down here to contract terms. Should we extract a front end payment? Well, this was touched on by one speaker. And he's right. If you have a front end payment, first you are guaranteed that the company is going to do some hard work to get their money back. I personally feel that the more front end payment you get, the better. Second, your patent may go down the drain and all you end up with is the front end payment, but at least it insures that they work on the project. Now, what about the royalty? People say, "What's your standard royalty payment?" Well, there is no such thing. If I have an invention in the magnitude of adding a new and improved eraser on a pencil, I am going to get nothing for it, but if I've got a cure for cancer, I can name my own terms and get it, probably. So you have to play it by ear. Usually the royalty payment is smaller where the front end payment is larger. You've got to trade off their cash for a greater long term investment.

Next, should it be exclusive or non-exclusive? Well, it depends upon the invention. For example, we will be having a patent issued very shortly on leaching ore dumps of mining companies. It would be ridiculous for me to offer an exclusive to Kennecott, for example, because they can't use it anywhere but on their own dumps and it just cuts me out of a possible royalty that we might be getting from Anaconda, Phelps, Dodge and all the rest. So here's a perfect example of a non-exclusive licensing arrangement. On the other hand, you sometimes have to go to an exclusive license and that's where the licensee has a large investment and can't stand the competition. In other words, you've got to

do a lot of research on this thing. Well, I can't go out and sell a non-exclusive to some companies where we haven't even reduced it to practice for example. So you have to play that one by ear.

This brings us to the point of how you negotiate. Maybe this suggestion would come up better in the later session, but I'll tell you one thing that works. It works for me and I just stumbled onto it. We were negotiating with a company on one invention and during negotiations the prospective licensee said to me, "Now lookee here, we're just poor old country boys. We don't know what we're doing here." I said to him, "Listen, I looked you up in Dun and Bradstreet." There were four of them sitting there and they were all multi-millionaires. They owned a milling company, they owned the cultivated lands, they owned 200,000 acres of timbers that were uncut and they owned the local banker. I said, "Every time I've done business with you country boys when I lived in Texas I got my shirt ripped off my back." He slapped his knee and said, "Well, I guess we understand each other." During the negotiations things were bogging down a little bit and he said, "You know, I think we could get together maybe, but that $50,000 front end payment you are asking is just too much." I said, "Hold the phone we may as well forget arguing about the front end payment right now. There is one thing that is not negotiable and that is the $50,000. Now if you want to talk on the other issues and keep the $50,000 in the back of your mind, on the back burner, all right." Which we did. Later on in the afternoon, we had negotiated all the other points and the $50,000 was never brought up again. The point to be made is that you must establish the level at which you will not further negotiate. This sets the stage for all later negotiations. We finally ended up getting the $50,000 plus

a good percentage of their net sales. Now, why could we get this much? This is what I am getting at and there is a funny story, which isn't typical but it happened. We filed on the silicon carbide process before we even knew we had a prospective customer, which is contrary to what we usually do. News of the invention got into the papers and lo and behold the EPA had forbidden the rice millers to burn their rice hulls. The first bite we got was from a fellow who said, "Look, for God sakes, please come out here and put your machinery in here. I've got 360 acres of rice hulls six feet deep and every time the wind blows I block the school buses." Well, this was too good to be true. Soon as they found out there was a buck to be made out of silicon carbides, things went a little differently. But here is a case where we played it by ear and got the maximum out of it. You've got to learn to play them by ear and you have to have the guts at some point in the negotiations where you must say "No, we're not going to change on this." It's good tactics because once you say "NO" and you make it stick, then later when you say "NO", there is less argument. Assume for example that they ask you some jackass provision like "I want you to hold me harmless in case I'm ever sued for infringing someone else's patent." You say, "Where did you ever hear that?" And if he says, "My attorney told me to ask you maybe." Then all you say is "NO". And he will probably say, "Okay, I asked."

Now, as a realistic source of what royalties you might get, we use the College of Business occasionally. If we know the area in which the invention is going to be sold, we ask them to make a search of the records available to them, and to tell us what the total business is in that area. If we have an improvement patent, which is most likely what it is, then we try to determine

the fair amount that we are contributing to the product. And let me tell you one thing here. Don't ever try to force a license down a man's throat even if you think that he is not going to resent it later. Don't ever do it because an agreement is a thing that's satisfactory to both sides. You both have to live with it and when you sign a contract with a man he should like the treatment that he got the first time. It is this repeat business that at the end of six years is just beginning to catch up with us at the University of Utah, and I am truly thankful that I have really never taken advantage of a man; at least I don't think I have.

Now that I have given you the gist of my story, I'll tell you my joke. I heard this one the other day and I think it is apropos here because there are just as many different methods of marketing as there are points of interest on how many children constitute a fair sized family. Two fellows were talking at a class reunion and Charlie says, "By golly, Joe, I haven't seen you in ages. What happened to you?" Well, I am married and got children." "Oh, yeah? How many children have you got?" "Oh, I got six," answered Joe. "Oh," says Charlie with a faraway look in his eyes, "that's a great size family. I wish I had six children." Joe asked, "How many do you have?" "Twelve", replied Charlie.

# MECHANISMS FOR TECHNOLOGY TRANSFER: WARF - A SUCCESS STORY

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The only thing worse than being second to last on the program is being last, especially if one follows an act like Clarence Martin's and with the cocktail hour coming soon. I'll watch the time, but we still have a job to do here today: mine is to tell you about WARF and yours is to listen. Now, if you finish before I do, please bear with me.

Seriously, my topic is probably one of the easiest to discuss. Obviously, I wasn't present when WARF was incorporated in 1925, but it is a pleasure to tell a success story and if you measure WARF's success by such circumstancial evidence as the total dollars that WARF has contributed over the years to the University of Wisconsin, it tends to support a conclusion of success. As Henry David Thoreau once said, "Some circumstancial evidence is very strong, as when you find a trout in the milk."

Irv Antin has suggested that I may be able to give you some magic formula or incantation for success. There are, however, no formulas which I can pass along to you which will guarantee success unless it's the old adage about hard work. Later I will give you my analysis of why I think WARF has been a success.

I will begin with a bit of historic background on WARF which you may find interesting and some facts on the impact which WARF has had on the University of Wisconsin. Detailed facts on WARF's beginnings and its contri-

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* See Appendix B for biographical information.

butions to the University are set forth in a report which was prepared by Dr. E. B. Fred, Emeritus President of the University. I have only a few copies of that report here so if that supply is exhausted and you would like to have a copy please leave your name and I'll be glad to mail one to you.

In the early 1920's Dr. Harry Steenbock, a professor in the Biochemistry Department at the University of Wisconsin, found that exposure of certain foods, oils, or pharmaceuticals to the ultra violet rays of a quartz mercury vapor lamp imparted antirachitic properties to the substances. He applied for a patent on this discovery and offered to assign his patent to the University. The University was not prepared to handle the patent and refused it in the following words: "The Board of Regents cannot be expected to allot money for a patent application when it is not certain that it will receive something for such an expenditure." The then Attorney General also ventured the opinion that the University had no power to defend patents and that, therefore, patents in the hands of the University represented a questionable value.

Subsequently, so that the Steenbock patent could be assigned in some manner to benefit the University, a plan was proposed to organize a non-profit sharing corporation or a trust, the necessary capital of which was to be furnished by alumni and friends of the University, and whose management was to be in the hands of Trustees. It was through this mechanism that Dr. Steenbock's objectives were accomplished. Those objectives were "To develop a plan for making use of patentable ideas of various members of the faculty that would protect the

individual taking out the patent, insure its proper use, and at the same time bring financial help to the institution and in this way further the University's research support." Subsequently, on November 14, 1925, with $900.00 in capital supplied by nine alumni, each of who contributed $100.00, WARF's corporate charter was filed.

WARF was the first foundation connected with an educational institution to be formed as an agency independent of faculty and regent control and without any endowment other than the Steenbock patent.

Fortunately, the Steenbock patent and the licensing program under which it was administered turned out to be a "winner", ultimately returning about eight million dollars in net royalties. Thus, WARF's first and early income was obtained as patent royalties and the Steenbock net royalties, as well as those of some consequent "winners", foremost among which were the Link patents relating to the anticoagulant, warfarin, which provided the seed money from which WARF's current assets have been generated. Today the major portion of WARF's income is derived from investment activities. However, patent royalties still continue to make a significant contribution to such income.

What is WARF's patent licensing program?

WARF considers that its patent management program is an obligation to the University of Wisconsin faculty, staff and students which has as its major objective the transfer of technology from the University into practical use for the benefit of the public. Generally, there is no requirement that inventors at the University assign their inventions to WARF or, for that matter,

to the University. As a matter of University policy they are free to dispose of their inventions in any way they please. Even where an invention is made with WARF-supplied monies under a WARF grant there is no obligation for the inventor to report or assign the invention to WARF. He brings his invention to WARF on a voluntary basis.

The exception to these general rules lies in the area of Federal Agency funding, which was touched upon earlier, and where there is an obligation to the United States Government through the particular funding agency. The University of Wisconsin is a party to an Institutional Patent Agreement with both the Department of Health, Education, and Welfare and the National Science Foundation. WARF participated extensively in the negotiation of the provisions of those agreements in the form in which they are now offered to other institutions. Both of these agencies, as evidenced by the terms and provisions of their Institutional Patent Agreements, have recognized the incentive aspect that is closely associated with invention development and which Dr. Ancker-Johnson talked about this morning.

Because of its role as designee of the University of Wisconsin under both of these Institutional Patent Agreements, WARF has had its patent licensing policies reviewed by both agencies and has had those policies approved. It has gone farther than that, however, in relation to its designee role, in that it has a formal agreement with the University which recognizes the University's obligations where Federal Agency funding is involved, spells out WARF's general patent licensing policies, and affirms that it will take no action which will be inconsiderate of the University's obligations to any funding agency.

Fortunately, WARF's relationship with the University is not only contractual in nature but is also very personal. We feel we have very good people at the University with whom we work and we hope they feel the same way about us. WARF's door is always open to any inventors or potential inventors for a discussion of any problems they may have. If someone calls, we try to accommodate them as soon as possible which is very often the same day since we realize that timing can be essential and, as was suggested earlier by Niels Reimers, the follow-up should be quick.

I should add one other important factor. According to WARF's policy, the inventors of any patents which WARF administers receive 15% of the net proceeds. Where there is a sole inventor he alone receives the 15%. Where there are joint inventors the inventors as a group receive the 15%. There is no deviation from that policy. The remaining 85% of the net proceeds becomes part of WARF's annual research grant to the University. I should also explain that in most cases 15% of the net is really closer to 15% of the gross receipts obtained from the management of an invention since no overhead costs are charged against invention accounts. Only the direct out-of-pocket expenses incurred in handling a given invention are charged against that particular invention. After those expenses have been recouped through licensing or other arrangements, the inventor begins to share in the royalties at the 15% rate.

In line with the general topic this afternoon "Mechanisms for Technology Transfer", I would like to make just a few remarks.

First, I would like to talk about the patenting approach. This morning

Dr. Ancker-Johnson said something which I have heard often before and which has always bothered me. She called a patent a monopoly. This, I sincerely believe, is a misconception and a misunderstanding but one which has served the antitrust boys all too well. (These are the people that profess not to be "anti-patent" but through their participation in developing the proposed "Administration Patent Bill", the provisions of which could emasculate the patent system, leads me to believe the contrary.) In considering the term monopoly, keep in mind that a monopoly is something that deprives the public of something that it has. Patents don't do that. Rather, they give something to the public -- the disclosure of the new invention. The consideration for that disclosure is the seventeen year period for which the patent owner can exclude others from practicing the precise invention claimed. Observe further that the right is one of exclusion only -- no right to practice the new invention is conveyed. Such a situation obviously, could and often does lead to innovative efforts by others to avoid the patent. Then why patent? Why work under a system that has been defined as "an iron-clad, invariant, system of exceptions to a set of ever-changing, quasi-existent, rules"? A major reason is that a patent can provide at the least cost a solid base from which benefits for the University can be derived. This is an important consideration from the University viewpoint.

In licensing an invention we use the approach that Niels Reimers has suggested, for we too believe that personal contact is most important. We don't circulate lists of inventions and we discourage people from using such lists for evaluating their interests in what we might have to offer. We sincerely believe that face-to-face contact is the only approach which, in the end, will bring a satisfied licensee back a second time.

There is a story that one of my colleagues tells that I think supports the premise in the face-to-face approach to licensing. It seems that at one time one of his friends was looking for a job but could find no employment for which he was particularly trained. He did notice an ad for a bulldozer operator but he didn't have the slightest idea of how to operate a bulldozer. Nevertheless, he personally applied for the job. The foreman asked if he could run a bulldozer and was assured that it was no problem at all. He climbed aboard the machine without knowing how to start it. In fact, after much fooling around he couldn't even find the starter. After a short time the foreman returned and asked him if he was having trouble. He said the machine wouldn't start whereupon the foreman climbed up and started it. At that point the foreman asked if he knew anything at all about operating the machine. The obvious answer was "No" and consequently he was fired on the spot. But, said he, "I learned how to start a bulldozer." The moral to that story is of course that as a result of the face-to-face contact you are better prepared for a second attempt. You get the feedback from the potential licensee. Why didn't he take your invention? What are the real reasons for not taking it? Is it a matter of economics perhaps peculiar to that potential licensee? Are there other problems present which you may not have foreseen? Answers to such questions are certainly going to help you in preparing for the next contact that you make. In general, we look upon a licensee as a partner in the invention and we try to design our licensing arrangement so that in its operation it is equitable and mutually beneficial. That makes everybody happy in the long run.

Let me now give you just a few facts on the results of some of WARF's

efforts which, we believe, are attributable, among other things, to the face-to-face policy it applies in licensing. Some of the data I am about to give you are somewhat reminiscent of all of the many stories you have probably heard which start "I have some good news for you and I have some bad news for you." I'll begin with the good news. Over the period beginning with 1928, when WARF made its initial grant to the University of Wisconsin, until June, 1974, WARF has been able to give grants to the University totalling over sixty-seven million dollars. During that same period WARF has had forty inventions which produced licensing income of some sort. (Please understand, however, that those forty inventions didn't produce the sixty-seven million dollars. Those are the combined funds, derived from many sources.) Of those forty inventions, fourteen have produced between $10,000 and $100,000 each, nine have produced between $100,000 and $1,000,000 each and three have produced more than $1,000,000 each in net royalties.

Now for the bad news. The forty inventions which produced the income required consideration of 1,552 disclosures which were brought to WARF and from which came about 360 patent applications and 247 issued patents. We currently have about 70 disclosures still under consideration and get new ones at the rate of about 60 per year. Currently, the pending and issued U.S. and unexpired patents total about 275. These patents represent in reality about 165 licensable areas of technology since some of the licensable technology is represented by more than one patent. Thus, using those figures as a base, only about one out of every 40 disclosures considered for patenting and administration during WARF's lifetime has ultimately produced some income. There is really no way that one can predict that an invention

will be successful at the time the initial disclosure is made, particularly when the criterion for success is the income which can be derived from it. If you, or your Board of Regents, or with whomever you deal, looked only at the odds against an invention generating income in view of our experience, you might be inclined to take all of the monies that are budgeted for a patent and licensing function to the local race track where the chances for gain on the "long shots" are often better. However, fortunately or unfortunately, depending upon your individual viewpoint, there are many other considerations which enter into the picture. Major among such considerations, of course, is the movement of technology from the University into use for the benefit of the public.

It is interesting to consider what impact upon the general economy the inventions which WARF has successfully licensed has had. I don't think many people have looked at that aspect of licensing. To arrive at some reasonable conclusion we have taken the amount of royalty income which has been generated by each of WARF's forty licensed inventions and have translated that royalty income into the estimated sales which the licensees had to make to generate that royalty income. These are the results of that translation: Four of the inventions represent one billion five hundred million dollars in sales; nine inventions represent eighty million dollars in sales; nineteen represent twenty million dollars in sales; and eight represent one million five hundred thousand dollars in sales. The impact on the general economy of the licensing of inventions generated by programs at the University of Wisconsin is certainly evident. And this is only a single University's impact. Also, consider the impact on currency balance

of payments which royalties generated by licensing in foreign countries can potentially have. WARF, for example, has had a number of inventions where the income from foreign sources through licensing has far exceeded that which has been obtained in the United States.

In summary, WARF can perhaps be classified as a unique success story because of many interrelated factors. The ones I have chosen which I think are most significant are these:

1. Its concept and its basic governing principles came from people who had a great deal of foresight;
2. Its early administration and investment policies were in the hands of able and dedicated people;
3. The invention in relation to which it was conceived and founded was highly successful;
4. And this is very important, it was founded at a time and has functioned through a time during which the tax laws were much more favorable to this kind of organization than they now are. (The tax aspects related to the planning for and operation of a patent licensing organization are something that you will have to very carefully consider in view of the tax act of 1969.);
5. It has made many good friends in the industrial-commercial scene and such good friends can be called upon for an analysis of some inventions in the absence of the kind of protection afforded by a patent application or patent;

and last but certainly not least-

6. It has been blessed with good luck.

MECHANISMS FOR TECHNOLOGY TRANSFER
DISCUSSION

Mr. Latker: I have enjoyed all these panel speakers very much and all their points were well taken. Being with the Federal Government, however, I do have somewhat of a problem with the overtone that for an invention program to be successful it must produce income. I have a different view on the idea of the necessity for producing income. To my mind, a successful patent program is one that provides a situation in which the inventor ultimately knows that he has failed. There are many situations in which the inventor is in an organization that makes no effort to provide him with the knowledge that his invention is a real washout. Frankly, in a situation like that I think that you have an unhappy environment. To my mind, the university environment especially should be one that gives the inventor the chance of knowing why his invention ultimately failed. If the program provides no income back to the university that can be ploughed back into the research, well, I think that's sad, but that to me is not a mark of failure if the creative people on the campuses know that their institutions have made their best efforts.

Questioner: I would like to have Clark McCartney tell us a bit more about what he means by the "fall back" clause.

Mr. McCartney: The first type has to do with the percent split on payments between know-how and the license of the patented invention. That is one fall back clause where if your patent application fails, you still have something in terms of income for this agreement. Another type of fall back, of course, is the

minimum royalty payment clause where it's a fall back to where you have a performance guarantee written into the agreement so that the licensee is bound to deliver X dollars to you for minimum performance.

Questioner: In view of the panel's comments on recommending that the personal approach be used to licensing, I was wondering if they would care to analyze the government's approach which is advertising through NTI (National Technical Information Service) as a means to obtain interest from industry?

Answer: I think that's almost hopeless.

Questioner: Should the licensor or the lincensee be placed in a position of handling the enforcements of the invention in case the invention is being infringed by a third party?

Mr. Martin: We handle this at the University of Utah by making it optional. Our agreements include a provision whereby upon notice by the licensee that there is a potential infringer, the University of Utah, as licensor, may or may not file an infringement suit. First, if the allegation is unclear we don't want to be forced into filing something that we feel has no merit, and in those cases we turn it down. Then the licensee has the option of filing suit himself in our name. We agree to cooperate in all respects, but the licensee must underwrite the suit and he can keep everything that he makes out of it. Contrary to something that was said earlier this morning, it does not relieve the licensee at any time of having to continue his royalty payments to us.

Questioner: I wonder if the panelists would comment on improving the

success ratio by letting the need to pull the technology be replaced by a push of technology into the market place. I think that some of the organizations you deal with have applied research programs which could do that work. For example, you actively seek to do research in areas where something patentable might come out of it and maybe the one in forty success ratio would be improved. Does anybody have any experience in trying that?

Mr. Bremer: I think the approach that you have to use is that the need try to pull the technology - I can only speak for experience at Wisconsin. In looking toward the applied areas you are in all probability looking primarily at the engineering school or the agricultural school within a university. The agricultural schools have generally taken the position that they are providing a service for the state, especially if it is an agriculturally oriented state, as is Wisconsin, and they usually make the results of their investigations available through publication or other means without moving in the direction of patent protection. There are exceptions, of course. In the Engineering School there is a different mechanism that is sometimes employed. For example, a company can make a specific grant to the university that is designated for use by a specific investigator for a specified end. However, the university will not accept that kind of grant with any restrictive clauses attached such as a restriction on patent ownership. In such a situation the company can do an end run, in a sense, through a consulting agreement containing an invention ownership clause with the investigator to whom the grant is directed. In that way the company would obtain the benefits of the applied research but without interfering with the university protocol. So

you can do applied research with company sponsorship at a university by employing that mechanism and I think that may respond in a sense to what you are looking for.

Mr. Gentry: I'm not sure what Norm Latker's point was about making money and success but in my administration of patents, and the knowledge I have of others, I don't know of any situation where an inventor is told that he will be unsuccessful unless his invention makes a lot of money. I think we all work overtime to try to let down inventors whose ideas are not the greatest in the world as gently as possible and to make him feel successful. So, Norm, what was your point? Maybe I missed it.

Mr. Latker: Some of the people here haven't really entered into active programs. There was some overtone along the line that, well, this is a difficult business and there is a prospect that you know you'll never make a nickel in the business. The only point I was trying to make is that if you never make a nickel, but you do have a program, then you are serving a purpose at the university by providing to the inventor the knowledge that he is being taken care of.

Mr. Bremer: I think, Norm, that the primary purpose, and we certainly subscribe to this purpose, is the transfer of the technology out of the university community and into public use as quickly as it can be done on a reasonable basis. Money-making is really incidental to that process and that's where the good luck comes in. If you catch the good ones why that's fine, but I know in WARF's history there have been many inventions where there has

been a transfer of technology with little expectation of any return at all and it has been just a matter of serendipidity where some return has been generated with a late blooming kind of patent on some technology that initially was not expected to generate any kind of income. This has, perhaps, been expecially true in the medical field.

Mr. Latker: The feedback to the inventor, I think, is very important in continuing his research. He may be living in an Alice in Wonderland sort of situation and feedback would help him guide his future research. The hope of ever getting big ones out there if you don't ever have a patent focal point in your institution is not a bright one.

Questioner: I just want to inquire about infringement from the other side of the coin: the defense of the infringement, say, in what the institution should or should not reasonably expect to take in that area. We have been asked in a few cases at least to bear the expense of the defending. In the event of that contingency, we have resisted so far. I don't know whether our fears are justified or not.

Mr. McCartney: Well in my discussion on the infringement clause, which was limited obviously because of time, I made reference to the fact that we of course allowed the licensee to defend in an infringement suit, or bring infringement for that matter if he wishes to do so, and prosecute on his own without expense to the lincensor. However, if we come up against a toughy and we want to continue negotiations, we have allowed, that where he has to defend, then expenses could be offset at some percentage of the royalties

received from the lincensor payments. That is a trade-off which has gotten us over some of the difficult areas in negotiation.

Mr. Bremer: Of course, if you license nonexclusively, you've got two options and that's the easiest way to go in that circumstance, that is, to license rather than litigate. A nonexclusive license can be designed to have exclusive overtones through setting up a royalty schedule which will give the benefit of a semi-exclusive arrangement but still provide an incentive by establishing royalty rates on an ascending scale measured from the effective date of the agreement. In that way the licensee who gets in first still has an advantage over the licensee who comes in later, but you have not foreclosed your position to license.

Questioner: A 40 to 1 shot bothers me. It either could be because the invention isn't that good or it could be that the licensing agent isn't that good. Is there any thought of switching horses in midstream if you had a fair shot at it, say, a year, two years, three years or whatever the time is for the invention? Or try another mechanism, give it back to the inventor, try another corporation? You are doing it in house. In other words, just don't hold it all the time and say, "Well, I gave my best shot," because you may not have the contact and the inventor may be the loser not because the invention is bad, but because of not having the right contact. Is there any thought in your program of switching horses?

Mr. Bremer: I think there are several considerations in that. First, the kind of figures that are quoted are not 40 to 1, they are more like 500

to 1. Those are the odds that are more normally quoted on a disclosure ultimately producing income if you look at them all. Second, at most universities there is so much federal agency funding that it is almost impossible today to find an invention that isn't touched by, or contaminated, if you want to use the word, by some federal agency funding and you don't have an option in that case. The only option you have left is to give the invention back upon the request of the particular federal funding agency. If there is federal funding you can't give it to the inventor, and if within three years you haven't done anything with it, the funding agency is within its rights to ask for the invention to be assigned back to them. In reality you don't have many options over a long period of time unless the inventions stay in the portfolio. Then what happens is just the result of human nature, as the inventions age in the portfolio they get less attention, unless, of course, you get into an invention area where you've got a late bloomer. We have had several of those where the inventor has been ahead of his time by six, seven, or ten years and suddenly the technology has caught up with the invention. You then suddenly find that you've got a licensable package that you didn't have before just because the technology didn't exist on the commercial scene earlier.

Comment: I'm going back to the question the licensee handling the enforcement action and the panel seems to think that the issue is who pays for the cost of litigation. I think that may well be one of the simplest points to handle. I think we all know that in the patent business the enforcement of a patent litigation can be a very nasty affair. There are a lot of aspects that can be drawn into a patent suit and I am wondering whether you all have been

In that situation where the question of the handling of the litigation by the licensee was a matter of embarrassment to you or potential embarrassment to your inventor, or possibly leave you the Public Interest Corporation open to a potential anti-trust violation because these patent lawsuits are not simple. They are not restricted to the question of whether it is a valid patent, simply whether there is an infringement, and they want a plain reading of the word. This can be a very complicated subject and since we all represent universities that have a purpose other than defending a licensee's patent position, we have to think of these things.

# INTELLECTUAL PROPERTY: PRIVATE RIGHTS AND PUBLIC USE

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Anything identified as opinion, of course, in no way represents Administration or Department of Health, Education, and Welfare policy.

On the eve of this country's bicentennial anniversary, I think it appropriate to revisit the Constitution and its framers to refresh our memories on the birth of the intellectual property clause.

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. Thus, it was no accident that the salient portion of the Constitution drafted for the purpose of protecting your liberties made the Government the servant and protector and not the master of your individual rights.

Thus, the fifth amendment of the Bill of Rights provides that:

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

It appears that the absence of any one of the three words, "life" -- "liberty" -- or "property" could have the effect of negating the other two. This seems especially true if you were not guaranteed the right of "property" under the conditions specified, since private "property" is a necessity if you are to

*See Appendix B for biographical information

have control of your "life" and "liberty". I might add inferentially that it is contended by some that the free enterprise system is dependent on/or sprang from these words, since without the protection of private property from arbitrary intrusion, that system could not exist. Certainly the words distinguish our society from the various forms of the world's collectivist societies.

Now, we all know that the word "property", even at the time of the framing of the Constitution, included "intellectual property". But not-withstanding the generic protection of property in the fifth amendment, the framers chose to be even more explicit about this specific category of property, and provided this language in Article I, 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 writing and discoveries."

Why -- this special handling of this category of property?

There was no recorded debate in the Convention on September 5, 1787, when Article I, Section 8, was presented, and it was approved unanimously. That 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, probably due to some positive prior experience and examination. Within the eighteenth-century context of natural laws or rights, intellectual property had received affirmative expression not only in English and Commonwealth laws, but in the Declaration of Independence, which provided that "All men are endowed by

their Creator with certain unalienable rights", and "that to secure these rights, governments are instituted among men . . ."

Madison, the chief architect of the Constitution, did not end his interest in intellectual property with the Constitutional Convention. He made the following illuminating statements in support of the prospective Federal authority to award patents and copyrights:

In the Federalist on January 23, 1788:

> "The utility of this power will scarcely be questioned. The copyright of authors has been solemnly adjudged, in Great Britain, to be a right of common law. The right to useful inventions seems with equal reason to belong to the inventors. The public good fully coincides in both cases with the claims of individuals. The States cannot separately make effectual provision for either of the cases, and most of them have anticipated the decision of this point by laws passed at the instance of Congress."

In a letter to Thomas Jefferson on October 17, 1788, he made a more important insight:

> "With regard to monopolies, they are justly classed among the greatest nuisances in Government, but is it clear that as encouragements to literary works and ingenious discoveries they are not too valuable to be wholly renounced? (These two sentences appear to be an attempt by Madison to distinguish between past monopolies

of commodities granted as personal favors and the suggested monopoly for novel intellectual property.) Would it not suffice to reserve in all cases a right to the public to abolish the privilege at a price to be specified in the grant of it? (This appears to be the first reference to Government "march-in" rights!) Monopolies are sacrifices of the many to the few. Where the power is in the few, it is natural for them to sacrifice the many to their own partialities and corruptions. Where the power, as with us, is in the many, not in the few, the danger cannot be very great that the few will be thus favored. It is much more to be dreaded that the few will be unnecessarily sacrificed to the many." (Parenthetical sentences and emphasis added.)

In this statement, and especially the last sentence, the answer to the need for specific protection of intellectual property, notwithstanding its generic inclusion in the fifth amendment, seems apparent. First, the use of the term "monopolies" suggests that Madison knew that the nature of an individual piece of intellectual property is such that it could be useful to all people and at the same time be susceptible of ownership by one person, while on the other hand, diversity of ownership of all other categories of property precluded the possibility of monopoly. The strong possible argument against an indefinite monopolization of valuable intellectual property and its end product under only the fifth amendment and his recognition that "The States cannot . . . make effectual provision", suggests that Madison knew that the rights of the creative few would be in danger without clarification in the Constitution. Thus, a compromise was

struck under which intellectual property was to be owned for only a limited term in exchange for the creator's right to exclude. It was under these circumstances that intellectual property -- that property which makes possible the use of all other property -- obtained special consideration in the Constitution.

There is little that I've presented that appears to be subject to question. Even those who have difficulty with the intellectual property clause do not advocate its repeal. Their argument has not been directed against the Government's responsibility for protection of private property and the special reward promised by the intellectual property clause, but erosion of the concept through convincing of an immediate need to limit the reward in the "public interest" or because of public involvement in the difficult delivery process which intellectual property must move through before reaching the public in useable form. These arguments, used in inappropriate situations, are probably what Madison considered "to be dreaded".

As we discussed on previous occasions, since the inception of the patent system, this country has moved from a rural to a highly industrialized nation. In the process, resources and creators flowed into highly sophisticated industrial research organizations. Such creators were required to assign their creative rights to the organization without any added compensation over and above their salaries. As I noted on that occasion in greater elaboration, this arrangement was tolerated by society and confirmed in the courts as to private organizations and their employees.

When the 17 billion dollars of Federal funds began flowing into research some twenty-five-or-so years ago, through the funding of the Federal Government's

contract and grant system, the simplistic policy that "What the Government (or public) pays for (or even partially pays for), it should own" was applied in practice to the total inventive result of some Government funded research programs. This was really an extension of the already developed and accepted concept applied to private industry, discussed above, that an employer (here, the Federal Government) can take assignment from an employee (in this case, the Government's grantees or contractors).

As I indicated previously, I thought utilizing this concept in all Government contracting situations to be poor policy, as it did not maximize delivery of inventive results to the public, or protect the equities of all the parties involved, in my experience or that of others. This was explicitly pointed out to DHEW by the GAO in its 1968 Report to the Congress on "Problem Areas Affecting Usefulness of Results of Government-Sponsored Research in Medicinal Chemistry", which provided;

> "On the basis of our observations, we proposed that the Department direct its efforts toward timely determination of rights to potentially patentable inventions in order to reduce uncertainties as to the status of invention rights. We proposed also that the Department clarify the intended use of Institutional Patent Agreements, of which only limited use has been made, but which appeared to be a useful device for assigning ownership rights while protecting the public interest."

After my review of the Constitution, I believe that the legal basis for this finds some support.

Now, the primary argument of advocates of a Government-title policy without reservation maintain that those Government research programs utilizing a Government-license policy result in an "unjustified windfall" in the contractor. Notwithstanding the fact that no Government research program really utilizes a Government-license policy without reservation, consistency would lead one to the belief that a Government-title policy without reservation results in an "unjustified windfall" in the Government. If there really were such a "windfall" in the Government, the policy would be constitutionally suspect, since there is a suggestion that "private property" is being "taken for public use without just compensation", since the chain of title, as provided by Article I, Section 8, must start with the inventor, and proceeds to the Government only through contractual assignment.

In truth, "just compensation" for future inventions generated under Government contracts cannot possibly be determined at the time of contracting, no matter what patent clauses are used, and any equitable policy in which the Government wished to retain exclusive rights would have to be based on compensating the owner of the exclusive rights at a time when its commercial value could be assessed. Compensation would ordinarily be in excess of the contract price, unless the invention were the specific object of the contract, which ordinarily is not the case. In fact in the area of grant research it is by definition never the case. (I would point out that anyone supporting a Government-title policy without reservation at the time of contracting would need to establish that all future inventions were the specific object of their contracts; otherwise, the Government would be the recipient of a "windfall".)

Now, I consider it nonproductive to belabor the arguments supporting the two extremes of possible Government patent policy. I have chosen to fault the one extreme not for the purpose of supporting the other, but merely because it is the former that has become the more vocal. Unfortunately, when one extreme surfaces and the other remains silent, the Government policies that sit in the middle become pressured to give ground to the vocal extreme. Since as you all know, DHEW patent policy already sits in a middle ground, we cannot responsibly move without abandoning the protection of some of the equities of the parties involved. But, unfortunately, this type of resistance provides to the extremist the argument that we, in turn, are extremist in our position.

Now, of all the variant policies one finds under the President's Statement of Patent Policy, which in itself provides the framework within which reasonable men can find a middle ground, I believe DHEW's to be the most acceptable. It emerged from the crucible of debate with the clear recognition of the Government's obligation to protect the equities of all the parties, including the general public.

DHEW has two methods of making disposition of invention rights. Its standard policy is to defer determination until the invention is identified. We never take title at the time of contract, thus obviating any possible claim of unjust enrichment. In the majority of cases in which the inventing organization seeks to retain the exclusive rights to an identified invention they have made, we grant the request, subject to the kind of conditions Madison discussed. Thus, there is a requirement that if the organization chooses to license its rights, it first determines whether nonexclusive licensing will result in obtaining further

development funds. If exclusive licensing appears necessary on the basis of market conditions, then we limit such licensing to five years from first commercial sale or eight years from the license, whichever occurs first. You all know that there are other "march-in" conditions that needn't be detailed here. If the organization itself chooses to develop the invention, the limitation on its exclusive position parallels that which it could give to a licensee. The grant of a request is nearly always based on the fact that further risk capital is necessary to develop and bring the invention to the marketplace and the Department does not intend to provide these funds, ordinarily because such funds have not been appropriated. This is equivalent to a decision that the invention was not the specific object of the contract, and we do not wish to pay "just compensation" over and above the contract in order to maintain full rights in the invention. The decision to retain rights in an identified invention in the instances where this has been done was based on a finding that there was an intention to contribute the additional funding necessary to bring the invention to the marketplace. This is tantamount to a decision that the invention was the specific object of the contract and, therefore, the contract price plus the additional investment is "just compensation" for the taking.

Further, in our Institutional Patent Agreement program, under which grantees with patent management capabilities are afforded a first option to any invention made under their grant, an objective decision was made by the Department that because of the basic nature of the research supported, any invention that evolved could not be the specific object of the grant and would always require further development which we would not support. Thus, in this situation, we basically

decided that "just compensation" over and above the grant would always be required in order to maintain full rights in the Government, and that we did not wish to make such payment. I would add that the decision to permit the first option in the institution is conditioned, on the same limiting conditions utilized under our deferred determination policy.

Now, in practice, what has happened since the 1968 GAO Report? The statistics we have collected can be considered to be only approximate in that they were accumulated very rapidly through our files and with conversations with the parties in interest. The statistics are on the low side, as not all the interested parties could provide information to us within the time frame necessary, and most that gave us statistics were conservative when they felt figures could not be readily verified.

First, in regard to the GAO comments on Department performance, I would note, that since January 1, 1969, the Department has entered into 41 new Institutional Patent Agreements, bringing the total number to 56. Second, in regard to determinations under our deferred determination policy, average processing time is running between 15 and 20 weeks from time of receipt of a petition to final determination. This compares to a situation in 1968 when petitions basically were not processed.

Now, in regard to rights dispositions, our files indicate that 167 patent applications were filed since 1968 by institutions who chose to exercise their first option to invention rights under their Institutional Patent Agreement.

Under the 167 patent applications filed, the universities have negotiated 29 nonexclusive licenses and 43 exclusive licenses. In addition, seven options to license have been negotiated. Seventeen joint-funding arrangements with commercial organizations, involving only the possibility of rights to future inventions, have been made. I consider this an important statistic since it indicates a willingness to make arrangements prior to the time that inventions have been made on the basis that the institution has the flexibility of providing to the concern some invention rights if an invention should evolve from the jointly funded effort. The institution gains this ability to negotiate by virtue of its Institutional Patent Agreement. We are advised that on the basis of all the agreements noted, approximately 24 million dollars of risk capital was committed to the development or making of inventions evolving with DHEW support.

Under our deferred determination policy, it was determined that since July 1, 1968, 178 petitions have been reviewed. Of these 178, 162 petitions were granted. Under the 162 petitions granted, the institutions involved and responding have to date granted 15 nonexclusive licenses and 35 exclusive licenses. These licenses have generated a commitment of risk capital of approximately 53 million dollars. One of the petitions granted involved a burn ointment discovered at a university, which was patented for the university by Research Corporation, licensed to a pharmaceutical company, clinically tested under the direction of the company, and cleared by the Food and Drug Administration on the company's initiative. The drug is now commercially available.

To my knowledge, this is the only drug outside the Cancer Chemotherapy

Program which was initially discovered with Department support and has reached the marketplace through the investment of risk capital from the drug industry. We are aware of at least five other drugs outside Cancer Chemotherapy at various stages of development which were discovered with Department support and are now being developed with private support under licenses made possible under our deferred determination policy. (I cannot at this time advise whether the licenses granted under inventions retained under IPA's involve any drug development situations, but it is presumed they do.) These numbers compare to zero situations at the time of the GAO Report.

The approximately 75 million dollars committed to development of Department initiated inventions, although on the face appearing to be insignificant in comparison to the one-and-a-half billion dollars yearly devoted to research and development at DHEW, is in fact substantial when compared to the 100 million dollars devoted to directed research with profit-making organizations in 1973 and to lesser amounts in preceding years. The comparison to the 100 million dollars is deemed more realistic, since the 75 million dollars committed is substantially all for development purposes (directed research).

Much more significant than the figures involved is the information being provided by members of our audience which indicates that in the last two years industrial organizations have been actively pursuing university research, which I believe to be clearly the result of the audience's active solicitation of collaborative arrangements, which, in turn, was partly motivated by the flexibility provided by our patent policy. Thus, while the GAO Report indicated that in

many instances investigators formerly could not reach the point of conclusive failure with their innovations, that pathway appears to be open, along with the hope of successful utilization.

In light of the above, I believe Mr. Madison would be pleased that DHEW had not "wholly renounced" monopolies as "encouragements to literary works and ingenious discoveries".

In times of stress, other countries have abandoned, to their ultimate regret, commitments to individual rights for what was claimed to be the immediate "public interest". The concept of individual rights and the intent to protect them stems from the natural law understanding that rational individual thought leads to survival of all, while collectivism leads to ultimate abuse of such rights.

We are asked now by some to "wholly renounce" the intellectual property clause on the basis of that portion of Government research funds commingled with those of the private sector in order to complete the arduous task of bringing an idea from the lab to a finished product in the marketplace. There are too few who understand that to do so could ultimately mean the liquidation of the private ownership of all intellectual property other than that kept secret, or the fractionalization of all collaborative effort involving Government funding. As the man said, "The price of liberty (and property) is eternal vigilance".

# AVAILABLE CORPORATE ASSISTANCE: THE RESEARCH CORPORATION

Willard Marcy,*
Vice President - Patents

## The Innovation Process in the Educational Institution

The speakers at the previous sessions of this meeting have discussed thoroughly many facets of the complex process involved in the transfer of technology originating on university campuses. In reviewing the points previously brought out, it seems clearly evident that educational institutions have a much greater awareness then ever before of their responsibilities and obligations relating to effective transfer of technology developed in their research laboratories. What is more, this awareness is growing rapidly and will undoubtedly result in the near future in a great increase in the utilization of university-generated inventions. This conference, therefore, seems very timely and quite appropriate, and we at Research Corporation are pleased to have an opportunity to participate.

For my talk this morning I would like to review briefly the necessary steps that an educational institution should consider in developing effective technology transfer, then discuss the capabilities of Research Corporation and how and where they can be utilized by the institution, and finally discuss a patent awareness program, being funded in part by the National Science Foundation, which Research Corporation is undertaking with the cooperation of eight institutions selected to serve as a microcosm of the university community.

## Review of Transfer Steps

The key steps to be considered by any educational institution in developing

*See Appendix B for biographical information

adequate means for technology transfer are:

.... Development of an institutional patent policy

.... Formulation of procedural mechanisms for carrying out this policy, including the establishment of an institutional patent committee

.... Development of means for identifying inventive concepts

.... Development of procedures for evaluating previously identified inventive concepts, including both possible commercial viability and patentability

.... Establishment of plans for utilization of the most promising inventions and technology for the public benefit

.... Developing suitable arrangements for carrying out these plans

Taken in sum these steps constitute the process of innovation.

Existing patent policies at educational institutions come in all conceivable lengths and variations, but generally cover the matter of ownership or equity based on financial or other contributions of the parties involved in the discovery and testing of inventive concepts. A number of the important points to cover in drafting such policies was covered in one of the sessions yesterday. For a typical standard policy, reference should be made to a sample published in the Handbook of College and University Administration Volume 2, Chapter 8 (McGraw-Hill, 1970).

Unless implemented, any published patent policy is meaningless. Therefore, logical and workable procedures are an essential adjunct to any patent policy. Responsibility for carrying out the procedures must be assigned

unequivocally to an individual or an office in the administrative branch of the institution. In addition, a patent committee made up primarily of faculty representatives is also needed to interpret the patent policy, judge questions of equity and to oversee the functioning office in carrying out the policy.

The identification of inventive concepts is essential in order to bring to bear the mechanisms set up to deal with these concepts. However, this is perhaps the weakest link in the innovation chain of events. The strengthening of this step is the objective of the NSF-sponsored patent awareness program to be discussed later in this talk. At present, inventions are left for identification by the faculty researcher. While this person should be the first to know when an invention has been made, frequently he is not oriented to or interested in looking at his scientific output in this manner. For this reason, other people and different techniques should be used to ensure that as many inventive concepts as possible are identified.

The evaluation of inventive concepts for possible patentability and commercial promise should be left to knowledgeable and experienced scientists, engineers and business-oriented individuals. Since a wide spectrum of such people are not usually found on university campuses, the evaluation step is frequently done by outside organizations having available such expertise.

Once identified and evaluated as being worthwhile developing, however, inventive concepts will never benefit the public unless strong, positive initiative is mounted. Here again, in many instances, the educational institutions have neither the knowledge nor financial or business-oriented capability to

carry such initiatives through. Recourse to outside assistance is necessary.

Costs of the Innovation Process

The cost of carrying on the innovation process at educational institutions will vary widely. Since much of the work will involve resolution of policy and equity questions, the actual cost of such resolutions may well be obscure. Frequently, the individual or office assigned major responsibility for handling inventions also has other major responsibilities as well, and allocation of costs is difficult at best. Evaluation of inventive concepts may well be done by peer scientists for no additional compensation, but may take appreciable amount of time which would otherwise be devoted to teaching and research. While patenting costs are usually well defined since they will be documented in billings from patent attorneys, the costs of negotiating contracts, grants and license agreements will not be so well documented. These difficulties were discussed in the morning session yesterday and it was quite evident that the real costs for carrying out the innovation process are generally not well known even at those institutions which have been involved for some time in this area of interest.

Some rules of thumb ideas, however, may be worthwhile using. In our experience at Research Corporation we have found that only about one invention in ten passes the evaluation stage, and only one in ten of those accepted becomes licensed. Of those licensed, only one in ten produces appreciable royalty income -- $50,000 or over per year. Put another way, for every large royalty income producing invention, licensing negotiations must be carried on for at least ten inventions, and evaluation must be done on perhaps, 1,000 inventions.

While it is not possible to say how much these steps would cost for any specific invention until the particular case is actually processed, one might say that, on the average, each evaluation might cost in the range of $500 to $5,000, each patent might cost in the range of $1,000 to $3,000, and finding prospective licensees and negotiating licenses might cost in the range of $1,500 to $10,000. These costs vary appreciably depending on the technology.

The cost of developing patent policies, settling matters of ownership and equities, administering an innovation program, trying to obtain contracts and grants based on recently discovered inventive concepts, or in attracting entrepreneurial interests, just cannot be quantized. One way to control such costs would be to set up an office with a definite number of staff members and predetermined budget. If this office then works diligently and spends no more than its budget, it will be able to handle only a certain number of cases; ideas beyond the capabilities of the office staff or its financial resources would remain fallow or be taken up by others, perhaps through publication, without benefit returning to the institution.

Again, based on Research Corporation experience, one should expect about one invention to develop from the expenditure at an institution of about $1,000,000 of contract or grant money. If a firm effort were made to ferret out inventions, one might expect this ratio to increase to about one invention per $500,000 invested.

Another rule of thumb to guide administrators in setting up an in-house capability for handling the innovation process is that the institution should

have about $20,000,000 of contract or grant money in the scientific or engineering areas before such a capability should be considered. Up to this amount the institution would be well advised to use outside expertise entirely. Even with an in-house capability, use of outside expertise is advisable in the more complex and highly market-oriented cases.

Research Corporation Capabilities

I should like to turn now to describe briefly Research Corporation's organization and capabilities, and to comment on when, where and how educational institutions can best take advantage of these.

Research Corporation is a nonprofit, tax-exempt foundation with two main objectives. These are

.... to support fundamental scientific research at educational institutions through its grants programs, and

.... to furnish educational, scientific and other nonprofit institutions an inventive administration service, including the evaluating, patenting and licensing of inventions.

The invention administration program is conducted by a technically trained, market-oriented staff. The staff's members include 8 chemists and chemical engineers, who are experienced in the chemical, pharmaceutical, and foods industries; 2 mechanical engineers, and 3 electrical and electronic engineers and physicists. One additional member is trained in aeronautical engineering. All staff members have had industrial experience before joining the foundation.

The staff is located in New York and is divided administratively into two

groups. One group is responsible for initiating and developing suitable relationships with the institutions served, as well as for evaluating inventions emanating from these institutions. The other group is involved in prosecuting patents covering accepted inventions, and in initiating, developing and concluding licensing arrangements with industry. The latter group is also responsible for administering the licenses during the life of the patents. Individuals in both groups also are available for and do furnish advice to institutions when requested, concerning patent policies, and equity and licensing problems.

The foundation charges no fees for its services, relying on its share of any royalty income resulting from its patenting and licensing activities on behalf of the institutions. In case of certain types of litigation, primarily that involving infringement, the institution may be asked to share the cost. Fortunately, such cases are rare, having occurred on only two or three occasions in the past 25 years where institutions were involved.

All income obtained from licensing activities is divided between the foundation and the institution in accordance with prearranged agreements. If the institution's patent policy allows, a portion of this income is also shared with the inventors. The institution's income is available for any purpose the institution chooses. The foundation's share, however, after expenses, is made available in its entirety for its grants programs.

The foundation maintains favorable working relationships with all the government granting agencies, particularly the National Science Foundation and

the Department of Health, Education and Welfare. Not only does it try to keep up with the important changes in policies of these agencies, but it also becomes involved in the progressive evolution of these policies wherever and whenever this is possible.

Thus, Research Corporation is available and can provide helpful assistance to educational institutions in many areas, including the formulation of patent policies, the development of mechanisms to implement these policies, the identification and evaluation of inventive concepts, and the patenting, licensing and administration of inventions accepted for development for the public benefit.

Patent Awareness Program

Earlier in this talk I referred to the identification of inventive concepts as a weak link in the innovation process. With both intellectual and financial encouragement from the National Science Foundation, Research Corporation has embarked on a program to increase the ability of faculty members and administrators alike to recognize inventions developed at educational institutions. As the last topic of this talk, I would like to describe this program briefly and to indicate the expected results. Under the NSF grant these results will be made available broadly to interested parties when the entire program has been completed.

The program is envisioned as the testing of a premise that development of an enhanced patent awareness at educational institutions will lead to an earlier and more widespread identification of inventive concepts resulting from supported research. Such an identification, in turn, is expected to result in a more effective commercial realization of inventions to the benefit of the public, and a better understanding of the technology transfer process as it relates to inventions from academia.

The work is already underway and will continue over a three-year period. As mentioned previously eight institutions of higher learning in the United States have been selected for this program. These range from very large, very diverse state-supported universities to relatively small, basically technological institutions.

The program consists of four parts:

.... a preliminary review of the ongoing research at each institution

.... an educational and indoctrination phase

.... a period of continuing intensive support

.... analysis of results and preparation of a final report and work output suitable for publication.

The Preliminary Research Review involves a study of all reports made by the institution for the previous five-year period relating to sponsored research.

As part of the study, preliminary visits are to be made to the participating institution to obtain and discuss the content of these reports with the administrative staff. Some attention will be devoted to selecting those projects which appear to have some promise of either leading to patentable inventions or to new and commercially useful technology. This study will also enable the selection of the most promising areas for further indepth study. The purpose of this review is to provide a base for later comparison of the results of the next two phases.

An Educational and Indoctrination phase will consist of lecture-seminars specifically directed to those faculty researchers working in the disciplines that are deemed most likely to provide inventions.

Generally these meetings will be oriented towards one broad discipline at a time - chemical, mechanical or electrical. Additional meetings may be necessary to cover adequately medical schools or health science centers. Each meeting will consist of a lecture of about one-half hour's length followed by a question and answer period. All lecture-seminars at each institution will be completed within about a three-day period. Additional ad hoc forum discussions will be scheduled as requested by individual or group researchers. Meetings will, in general, be limited to up to 30 attendees. Any subsequent meetings will be limited to no more than 10 attendees at each meeting so that individual participation and interaction can take place more readily.

The third phase of the program will involve conferences between the individual researcher and Research Corporation staff members. These conferences will be conducted at each institution beginning during the three-day lecture-seminar period. A selection for such individual conferences will be made based upon studies of grants and contracts proposals and interim or progress reports on ongoing research, and on an indication of personal interest by the researcher. This phase is felt to be the most important and most productive part of the experiment.

These one-to-one meetings are designed to develop both a better

knowledge of the nature and direction of the individual research project and also a better rapport with the researcher himself. Historically, we have found that the establishment of a personal sense of mutual trust and respect between researcher and Research Corporation staff member overcomes much of the reluctance to disclose inventions properly and adequately. During these individual meetings the general material covered at the lecture-symposia can be refined and related to specific technical problems and idiosyncracies of individual researchers. In addition it will be possible to develop a time frame for future monitoring of the research process and establishing future meeting dates.

The initial conferences will be followed by a period of continuing support over the following two years during which frequent additional personal conferences will be held, as necessary. We are convinced that the development of patent awareness must be a continuing affair. Attendance at lectures-seminars and immediate follow-up personal interviews appears to be effective initially in developing or enhancing an awareness, but, unfortunately, in the long run the new knowledge is quite transient, lasting only weeks in some cases. To overcome this, a Research Corporation staff member will return to the institution at least two days per month for the first 12 months after the completion of the initial personal interviews and then 1 day per month for approximately 10 more months.

The fourth part of the program would provide an evaluation of the effectiveness of the program and the production of a reproducible work

output. The evaluation would involve both short-term statistical and qualitative analyses and similar long-term analyses.

The total cost of this program is estimated to be about $200,000 and the total elapsed time is expected to be three years.

At a minimum the proposed program is expected to accomplish the following:

.... Development of an awareness that inventions of value to the public may be inherent in academic research projects.

.... Definition, in general terms, of an understanding of the factors that make an invention both patentable and licensable.

.... Development of an understanding that publishing and patenting are compatible and not irreconcilable opposites, as is frequently felt to be the case by academic researchers.

.... Presentation of the role of the patent system in developing new products or processes for the public benefit.

.... Provision of descriptions of the various methods, other than through patents, for transferring technology.

.... Encouragement of closer working relationships with government granting agencies and industrial sponsors through development of a knowledge and understanding of institutional patent policies, administrative procedures and faculty and administrator responsibilities at individual institutions.

.... Development of a broad understanding of technology transfer methods through presentation of actual case histories, including some indication of economic and other benefits accruing to the general public,

the government, the institutions, and the inventors.

.... Development of appropriate and more effective mechanics for evaluating inventive concepts from educational institutions.

.... Development of an awareness of means for carrying forward worthwhile inventive concepts to commercial use for public benefit.

Conclusion

In the discussion this morning the innovation process in educational institutions has been described, and some practical hints as to costs and recommended practices were presented.

The organization and general capabilities of Research Corporation were described and some idea was given as to the ways in which the foundation can assist educational institutions in developing inventive concepts through its invention administration program.

One area of assistance currently being provided by the foundation with financial support by the National Science Foundation, was summarized in some detail, along with the expected results. This program is designed to enhance the patent awareness of both faculty members and administrators at educational institutions.

# AVAILABLE CORPORATE ASSISTANCE: BATTELLE DEVELOPMENT CORPORATION

R. F. Dickerson,*
Vice President and General Manager

## BDC-What it is and How it Works

It is a pleasure to be able to have a few minutes with you this morning. We are pleased with the apparent success of this meeting and the interest that you all have shown in the various discussions up to this point. I sincerely hope that it has been a valuable experience for each and every one of you.

As several of the speakers mentioned yesterday, I think there are times when a university might require the assistance of an organization such as The Research Corporation, Arthur D. Little, Inc., or ourselves in the evaluation and subsequent licensing of some of your ideas. I believe that there are many universities who are initiating an active patent program which can be helped by one of our organizations temporarily. We feel that we can provide a service during the time that the university is developing its patent and licensing business. We are well aware, of course, that if the business reaches the proper magnitude, the university should consider strongly establishing its own people to accomplish the patenting and marketing functions of Battelle Development Corporation (BDC). Nevertheless, we are ready, willing, and able to assist in the interim if the university really is interested in establishing a strong patent and licensing program.

A little about BDC may be in order. BDC is a wholly-owned subsidiary of Battelle Memorial Institute (BMI). We are chartered as a not-for-profit organization, and we are assigned the responsibility of searching for inventions,

*See Appendix B for biographical information

evaluating these inventions, developing those which pass evaluation, and, subsequently, attempting to license these inventions to industry. We are probably one of the few organizations of our type with money to invest in the development of worthy inventions.

The word, worthy, is an interesting word. As you can imagine, we have, over the years, developed a rather strict method of evaluating ideas to determine whether or not they are worthy. Our first step is a screening process in which we subject the ideas to a set series of screening criteria. The idea does not necessarily have to pass all the screening criteria to pass the screening itself. However, should it not comply with certain of the criteria, it is most assuredly not going to pass the screening operation. The criteria briefly stated are as follows:

1. The idea must offer some benefit to mankind. In other words, we do not look at gadgetry, cosmetics, weaponry, etc.

2. The idea must be a major improvement in a technology, device, or process. We feel that a minor improvement is hardly worth the effort of development since its lifetime may be relatively short.

3. The idea must have potential for patentability. You must remember that our source of income, which, incidentally, would be also your source of income, is royalties from licensing. In order to obtain these royalties, we must have a reasonable patent position to offer the licensee. BDC or any other organization

like us does not develop what is commonly known as industrial know-how. Therefore, the licensee must accept, with the license, the responsibility of the final product development and the final product marketing in order to make the invention a success.

4. The idea or invention should not result in a product that could be considered controversial as far as BMI is concerned. An example of this might be a new birth-control device. It is completely acceptable for Battelle to do contract research in the area of birth control. However, for Battelle to market the license on a birth-control device and, consequently, obtain income from this device might result in controversial discussions and comments with which Battelle would just as soon not become involved.

5. If the development of the invention to the point of licensing will take more than 18 months, BDC does not tend to have a great deal of interest. We have determined that successful licensing is best performed if the invention can be licensed to industry at the earliest possible time. We have also found that a period of 18 months is a rather long period for this initial development.

6. We will not take on ideas and inventions which require a pilot-plant facility in order to interest the potential licensees. This is just a bit too much for us to accomplish.

7. We are cautious when government money has been invested in the development of an idea. I must say that this is not reason enough to drop the idea from further consideration. However, it is reason enough to raise a caution flag and cause us to study the potential market for this product with a great deal of care.

If an idea has passed the quick screening test, we then go into its various facets in more detail. We examine the patent literature by performing rather detailed patent literature searches both in the United States and in Europe. We submit the idea to technical evaluators skilled in the particular technology in order for them to tell us what their opinions of the technical feasibility are. Finally, we submit the invention to our marketing people so that they can get some quick idea about the market potential of the subsequent product.

If the idea still looks good to us, we then go into the various facets in still more detail. Our marketing people, for example, begin to do a reasonably detailed analysis of the type of market that will exist and estimate the income through royalties and fees. The patent people begin to think in terms of the preparation of a patent to cover the invention or ideas, and the technical people begin to think about the type of development program that might be needed to get the idea into a licensable stage. Naturally, we not only encourage, but we demand, feedback from all three of these sectors.

We believe that the patent people should have some say in the type of research that is done in order that the strongest possible patent position

can be obtained. Also, we feel that the marketing people must tell the technical people the point at which development could stop and the item could be licensed.

The technical people, marketing people, and patent people must then come up with an estimate of what the development will cost from initiation to license and how much time would be involved. If the cost is such that we feel a ten-to-one return on the investment can be recovered over the life of the patent, we are in a position to accept the invention and proceed with its development.

Our problem is one of shortage. Over the past 2 years in which I have had the responsibility for BDC, we have been able to license every idea which has cleared our screening and our evaluation. There is a shortage of good ideas, and we feel that we are not having an opportunity to look at all the good ideas that might be available.

It is my personal feeling that the universities offer an almost untapped source. It is also my feeling that there must be a mechanism by which organizations such as BDC can discuss with the inventors on the staff and faculty of the universities what really constitutes a good marketable idea. I believe that, if the potential inventor had an idea of what constitutes a marketable invention, we might see a great deal more of them.

I am also of the opinion that universities are ignoring a good source of income when they do not attempt to set up an active patent and licensing program within the university. In order to do this, the faculty of most

universities must be motivated more than they may be at this time. I think this motivation could be accomplished if the administration would indicate an interest in patentable ideas by some mechanism and make certain that the inventor is aware that the administration is willing to give credits for patents and patentable ideas.

BDC is available to assist the universities in any way that is reasonable. If you would like us to discuss university patent policies with you, we would be pleased to present the ideas we have. If you would like to explore ways in which BDC could work more closely with your faculty and staff, please do not hesitate to ask us since this really is our job.

Again, I appreciate having had the opportunity to participate in this meeting. I hope that you all received some value from the session, and I wish to personally thank Dr. Allen Moore, his associates, and the entire administration of Case Western Reserve University for organizing this conference.

AVAILABLE CORPORATE ASSISTANCE:
ARTHUR D. LITTLE, INC.

Alfred R. Johnson,*
Director, Invention Management

## The Invention Management Activities of ADL

It is my pleasure this morning to acquaint you with Arthur D. Little, Inc., also known as ADL, and our Invention Management activities.

Universities may benefit from such activities, in some cases, from the experience we have developed in commercializing inventions. While a university may have faculties with creative people who conceive valuable inventions, there may be no full time administration at the university to manage such developments properly. There is, however, an obligation to have the new technology benefit the public and also to provide additional funds for the university and the inventor. Skilled assistance is therefore necessary if maximum use is to be made of this creativity. This is a very difficult business, as anyone who has been involved must realize, and there are no pat answers or solutions. We do believe that we are in position to be of help and so I will give you a brief description, first, of ADL and then of our Invention Management work.

ADL was founded in 1886 as a firm of chemical engineering consultants to the paper industry, and was incorporated shortly thereafter. From the time of Dr. Little's death in 1935 until 1951 control of the corporation was in M.I.T.; it is now controlled by a trust for the benefit of the employees, although a small amount of stock is publically traded.

The company consists of approximately 1600 people about half of whom work

*See Appendix B for biographical information.

directly for clients. Some 25 percent of our business is with the government and 75 percent is with commercial clients. Roughly one-third of our work is technical and involves laboratory investigations, one third is nontechnical and relates to such matters as economic planning, marketing, and management consulting; and about one-third consists of a combination of the first two.

Because of the type of business, we have contacts with people at the management level throughout the Unites States, and in fact, in many places throughout the world. This can,of course, be of considerable help in our attempt to launch a new product or new process.

The need for Invention Management arose within ADL as a means of exploiting inventions made by the staff, but not owned by clients. Normally any inventions made while working for a client belong to that client, but we have found that, properly handled, we can often get support from a manufacturer for further work on an invention made by a staff member and owned by ADL in return for an option to a license. This means we can also participate in any commercial success of the invention through a royalty arrangement as well. Such laboratory support is very welcome by the inventor, and others involved in the project, as they normally want to be associated with the invention as it is developed. Invention Management at ADL is now about sixteen years old as a full time activity and extends to the development and commercialization of inventions made outside ADL.

As stated above, getting new technology into the stream of commerce is a very difficult and high risk business. Consequently, we have set up criteria,

based on our own experience, that must be met in order that we undertake a project to develop an invention.

These criteria are as follows:

1. The inventor must be very enthusiastic concerning the commercial potential of his discovery.

If the technical person is not enthusiastic, the invention is almost impossible to market.

2. The estimated market potential must be in excess of $2,000,000 a year sales in the United States.

It is hard enough and takes long enough to make an invention pay off, so it might as well be an invention that is reasonably worth while in the event it becomes successful.

3. There should be a good proprietary position -- that is, the invention should be patentable or involve a large body of know-how or both.

It is necessary to give any licensee a commercial advantage if royalties are desired, and this is a legal way to do this.

4. The invention must fulfill an identifiable market need.

Too often we have seen clever and innovative inventions that lead to generalities. Developing a licensable situation from such inventions is usually too difficult, and unprofitable.

5. The invention should not only involve sound technology but

should be an important technical advance.

We have found that minor improvements in processes and products are of little interest to prospective licensees.

6. There should, as an extension of the last point, also be a clear competitive cost advantage or a new product distinctly better than its competition.

7. Finally, the technology must be carried at least to the demonstration stage.

Too many inventions are pure speculation, and to investigate seriously such inventions, where the inventor himself has not demonstrated the principal, involves excessive risk.

It might be of interest to discuss briefly the procedure we follow with respect to inventions submitted to us from universities. A description of an invention is sent to us, and when sufficient information is available, and it appears that it might meet the criteria just discussed, the invention is submitted to the proper staff members at ADL for review. Their time is paid for by the Invention Management section as though we were a client. We try to complete our evaluation within three or four weeks even though a preliminary patent search is often required.

Since our income depends on successfully handling new inventions, the N.I.H. (not invented here) factor is not present. But even so, not more than one twentieth of considered inventions received any further encouragement by us. Although we prefer areas in which we have a good technical background,

there really is no limit to the type of technology which we will consider. Hopefully a temporary, exception to this is a limitation put upon us by the HEW. If HEW funds any part of a research project, it attempts to retain rights to any invention made on that project. A policy of HEW is that only non-profit patent licensing organizations can handle such inventions. ADL naturally feels that merely because it pays taxes, that such discrimination is unwarranted and not in the public interest. We have, because of this policy, had to refuse to handle several interesting inventions resulting from HEW sponsorship, submitted to us by universities.

Assuming now that we have made a preliminary evaluation and are favorably impressed with the possibilities of successful commercialization, we then suggest an Agreement with the university submitting the invention in the event we do not have a general Agreement. The nature of the Agreement may, of course, vary with circumstances, but normally it provides for exclusive control by ADL for a period of time usually twelve to eighteen months. If we do not succeed during this period in obtaining an active commercial partner, we may be required by the university to terminate the Agreement and give to the university all information, data, models, patent rights, etc. developed during the course of the project.

We do assume all the expenses or cause a licensee to assume such expense incident to the project from the time we begin our evaluation. Such expenses may involve further patent activity, further laboratory work, market and economic appraisals as well as costs associated with presentations and negotiations of licenses. We also may be involved in the subsequent policing of the

patent licensed and perhaps revisions of the Agreement.

ADL is paid, if at all, through the division of income from options and licenses granted. A typical arrangement calls for an equal division of income although this may be modified as necessary.

We have not, so far, attempted in many cases to act for universities in the exploitation of inventions arising from their faculty, but where we have, we have been reasonably successful. Through an Agreement with M.I.T., for instance, with respect to one invention, we have made and are currently making, a major contribution to their royalty income account.

Once an Agreement with the university has been consumated for a particular invention, we look upon the university as a client, but our day-to-day relationship is primarily with the inventor. We do believe that the inventor should be personally involved -- not only in the presentation of the invention to an industrial partner, but also, perhaps, in carrying out further work sponsored by the industrial optionee or licensee. This sponsorship could be an appreciable contribution to the work of any department.

Since the program we have carried out at ADL with ADL developments has been successful in generating a significant amount of sponsored work and royalties, we believe the same approach can be successfully extended to inventions arising out of university research.

AVAILABLE CORPORATE ASSISTANCE:
DR. DVORKOVITZ AND ASSOCIATES

Lloyd Patterson,*
Vice President

A Brokerage Service for University Technology Transfer

It's always a good feeling to be able to give a presentation and then escape and have the questions that may result answered by a colleague. But Bruce Dahlbo and I work so closely together that I don't think there will be a problem. Last night I went over the listing of the institutions attending this particular seminar and it was pleasing to note that over 50% of those present have some sort of an arrangement with Dr. Dvorkovitz and Associates. Also, there are several in the audience that know of the firm's name, however, don't quite understand how we function and the services offered.

I would like to point out that we hope to and are striving to be a profitable organization. We are international and the simplest definition of Dr. Dvorkovitz and Associates is that we are product scouts and new technology brokers.

We have offices throughout the world. These offices are small - one or two men per major country. The offices are headed by nationals who are full time salaried employees. Their basic role in life is to find new products and new processes and obtain authorization to expose them for possible business or joint venture arrangements. We program these opportunities and disseminate the information into the most likely potential licensees' hands. Over the past fourteen years we have tried to develop a program and a system to approach the most likely candidates.

*See Appendix B for biographical information

You've probably noticed out in the other room we have had a computer terminal on display. Computer terminals per se are not unique. We have data base banks in the U.S., Israel and Japan and these banks contain over 7,000 new developments which we have been able to find by contacting over 14,000 different sources during the past 14 years. We place the program of each one of the particular developments we have reviewed into the computer. We do the same with major corporations which have listed their interests and needs with us. We then use the computer essentially as a marriage bureau system.

The technique as employed roughly three years ago by Dr. Dvorkovitz and Associates and it is proving to be extremely successful. Currently we have over 500 arrangements for which we are responsible. Many of these have come from Universities and are being capitalized upon by corporations throughout the world.

We have an established group of more than 300 clients. Examples are Standard Oil of Indiana, Sherwin Williams, Pillsbury, Quaker Oats, Kimberly Clark, etc. We have as many clients overseas as we have in the U.S. Our obligations are first to these corporations. They pay us an annual retainer to find new products and processes and to assist them in accelerating their technical research and marketing programs.

None of our sources have any monetary obligations to us at all. We basically work with four types:

1. The Universities. We have been approaching the Universities and trying to assist them in licensing every way possible. Each one

of our people, whether in England, France, or here in the U.S., approach every major technically oriented university. University sources are not always the large, well known school. Some of the smaller institutions have been extremely productive and very successful. The universities, presently, constitute approximately 10% of the total base bank we offer to our 300 clients. If our clients reject the technology we have offered to them based on interest and needs, then we have additional thousands of direct contacts throughout the world that we can go to and offer the technology accordingly. These interests and needs we receive come from the direct contact of visiting with research directors, vice presidents in charge of corporate development, and presidents of smaller companies. They give us this information primarily because they are interested in accelerating their programs. They truly are interested in new products and opportunities. The other three types of sources that we do deal with constitute a larger percentage of the data bank.

2. The Independent Laboratory. Here there are typically five, ten, or fifteen men concentrating in one given area, having expertise in that area and, of course, doing research for profit. We have been very successful with these groups. They prepare an excellent package to present. Everything is tangible.

3. The Major Corporations. This could be spin off technology. I

don't like to use the term because it always gives one the feeling that perhaps its "old hat and dusty" and has been on the shelf for a long time. That isn't necessarily true and we're finding that much of the technology offered by the major corporations is of a kind that has experienced success. We have been successful in licensing corporation technology and it's becoming more available.

4. The Governmental Institutions. This includes the DHEW, the USDA, the Bureau of Mines, etc.

These are groups that are providing us with technology to expose for licenses both on an exclusive and non-exclusive basis. So our total base bank of over 7,000, I have previously mentioned, is made up of technology coming from these four basic sources.

I do wish to emphasize that the universities are beginning to place more technology into our system and therefore this percentage of the total data bank is increasing considerably. The quality is also increasing and this is one thing that pleases us. More options and licenses involving university technology have been experienced by our firm in the last three years than ever before. We have had a recent license which involves a six figure monetary number - a university development going into a major corporation in the U.S. So we're delighted with what we are experiencing.

The biggest problem we are encountering with the universities is that the preparation of the licensing package has not been sufficient. Normally, things

aren't very tangible. A corporation will not pay for a paper patent. They find that they need something that they can put their "teeth into." They want to have a model that they can pull apart and test and determine whether or not that particular development is an improvement over the prior art. Also, sufficient time for patent filing overseas assists in making an ideal package. We like to have U.S. patent applications filed, but we will also consider offering only know-how if filing has not been done. Our clients are interested in lead time. Corporations are usually looking for the opportunity of getting a product into the marketplace before their competition does.

We believe the system and the technique that we do offer can be, and is proving to be, very beneficial to the universities as well as other sources, and of course equally beneficial to our clients, the licensees. That is why we were continuing to be retained and have a continuing increase in our data bank size.

The company is relatively small. Our total staff is in the magnitude of 30 people, but we are doing only one thing: international licensing. We don't do any laboratory evaluation, market research, or acquisition work.

At the beginning I mentioned that we don't charge our sources and this is a very important thing as far as our service is concerned. We believe that the people who have invested money in a development and have done an adequate job of preparing the package for license have done a sufficient amount and now they should receive a return.

When I mentioned the company being responsible for 500 success stories many of these, of course, are options which may never develop into a license. Some of them also involve joint ventures. A portion of these, however, do include arrangements with universities. One of the fascinating things about this is that many of these corporations that have taken licenses and options from the universities, are also the corporations that have been funding and placing money into the hands of the same universities. Therefore, knowing the right people to meet, knowing what is available besides just giving the money to a university in a general way, has been extremely profitable in promoting licensing and technology transfer between universities and corporations.

Our organization in the last three years has been placing a considerable amount of effort in trying to work with the universities. In addition to our annual industry/university forums, which began in 1973, we have set up several individual seminars, with the University of Miami, and Northwestern, for examples, trying to introduce industry, and get the industry feedback into the university. This seems to help. You can do this on your own, of course, but the critical point is that <u>you must prepare properly, to offer properly</u>. During the last few days I have listened to a lot of problems being discussed and there are many involved, but one of the solutions is to prepare your package so you can at least encourage the industry to become interested. As I have mentioned they are not interested in just an issued patent. You need something tangible. You should have a sample, a working model, make available the faculty member involved, have the patent people involved, have some sort of an idea like controlling or monitoring air pollution or something of this nature.

Corporations are not difficult to work with. They are willing to give you the feedback of what they are interested in finding and what they need. We have programmed much of that information in our computer data bank. Industry is in search - they need products, processes, technology, etc.

So, what's so unique about our computer terminal? What's so unique about computerization? It's the way we are using it to locate and establish the technological fit. Competition? In a recent survey there were 50-55 corporations, firms or groups claiming to be involved in international licensing, or licensing in general. We believe Dr. Dvorkovitz & Associates are different and unique. We believe we are complementary to some, such as Research Corporation, Battelle Development Corporation, and Arthur D. Little, Inc. They function differently, have a different purpose in life. Our basic role is to serve as an intermediary, offering opportunities based on profile information. The story is very simple. Industry is anxious to meet you. Industry is willing to pay. If you can expose your technology properly, you'll end up being very successful in your licensing activities.

AVAILABLE CORPORATE ASSISTANCE
DISCUSSION

Questioner: As a general question to the panel, I wonder if there is anything inconsistent with being a not-for-profit organization and the fact that innovation largely deals with an entrepreneurial spirit.

Mr. Dickerson: I think it really depends on what your purposes are. If your purpose is like Battelle's to introduce technology to industry "not-for-profit" doesn't necessarily mean you don't make a profit. Being non-profit means just that. The two words are kind of different. The only thing about a not-for-profit is that you have to turn your income into the purposes of the not-for-profit organization. So in our case we have to be entrepreneurial in the business we're in to make the money hopefully that goes back into the corporation to be used for its other charitable functions.

Dr. Marcy: I think that the terms not-for-profit and non-profit are really definitions in the Internal Revenue Act. The way that you go about your operation really has no relationship to that except that you have to be careful that you don't do certain things that throw you over into the profit category and get you in the situation where you have to pay taxes. The advantage to being a non-profit or a not-for-profit organization, as we look at it at least, is that 50% of our income would go into the federal government coffers if we had to be taxed. We think that 50% is better spent by supplying grant money for basic research at universities and we think we know how to do that quite well. I didn't stress this when we were talking

before, but our grants are given for fundamental research in the sciences and we are just about at the moment, the only organization in the whole country that is doing this to any extent. We frequently find that we're giving grant money to individuals who have first approached HEW or NSF and have been turned down on the basis that the proposal is too far out. Why don't you go to Research Corp., if they will support you for a year or two and if you are successful, come back and then we'll give you a grant, from NSF and HEW. So we think that our little bit of pittance in this area is seed money and we'd much rather give it back to the university for this kind of research than to give it to the federal government general treasury where it's going to get lost somewhere and never come back. So in our case, the not-for-profit and non-profit category is something we are jealous about and we want to keep. It doesn't have any reference really to the entrepreneurial spirit or the way we go about doing our activities.

May I say one more thing. You can be a not-for-profit and still pay a federal tax. If you are chartered as a not-for-profit in the state, you may or may not pay federal taxes depending upon what IRS decides in the next six or eight months.

Mr. Dickerson: This is a more critical problem with Battelle than it is with Research Corp., believe me.

Dr. Johnson: Well, I am about the only guy around here who is in business to make a buck and pay taxes, aside from Bruce Dahlbo (of Dr. Dvorkovitz and Associates). But our business is based on doing work sufficiently well,

even though the price may be high, that somebody will pay for and pay us enough money so that we can pay taxes. And we do. And our handling of inventions and dealing with people have to be on that basis and the object is, of course, to make money for whoever we work for. If it's the universities, we intend to make money for them and I don't know that it's such a great difference between a not-for-profit and non-profit, but at least I know that in our case we are successful in making a profit.

Mr. Rosenberg: I know that many of the questions here will be concerned with how universities and colleges interface with the technology and the patent development corporations. I am also concerned with how HEW, for example, interfaces with these groups and I would like, if I can, to take a few minutes and ask Norm Latker if he could comment on that. That is, specifically, how does his agency interact with corporations such as represented here?

Mr. Latker: I wanted to volunteer that information. First, I'd like to say that the HEW patent policy just didn't grow out of a vacuum. I think Will Marcy is prefectly correct in indicating that his organization had a great deal to do with how it developed. The ultimate idea was to write an agreement that would create the kind of interfaces that we needed with patent management organizations, already in existence. Basically there are two clauses in our institutional patent agreement that directly relate to Research Corp. One of the clauses provides that any patent management organization that an institution uses must be for a non-profit patent management organization, so Dr. Johnson's criticism is perfectly correct. The second clause has to do with royalties. Now, these are two negative kind of aspects that are

in the agreement, and nearly the only two negative aspects that you find. The first one to my mind makes some sense because the Department had some fear that in providing first options to the institutions that we would create a patent portfolio in the hands of the universities that might attract the kind of patent management organizations that Tom Martin spoke about yesterday. Basically the limitation in the agreement was put in there with that in mind, but not aimed at anybody like Arthur D. Little, Inc. Secondly, we recognize that when the clause was included, you don't have a problem with the non-profit patent management organization because we know that the funds coming from the university sector are ploughed back into the research area. With the profit making organization, we don't know where the other half of the funds go. Our reasoning was that as long as there are non-profit people in the area, let's go with them because we are getting more funds back into the research area.

The royalty restriction to my mind makes less sense. Some major universities have been unable to acquiesce to the kind of ceiling that we have established. You know, a better policy on a long range basis would probably be to examine at the time we make the institutional agreement, what the university policy is. If it appears to be reasonable on its face, then you could just go with it. But unfortunately at this time we do not have a sliding scale situation and the prospects of changing it is somewhat dependent upon the squeaky wheel. This is all leading up and getting back to Arthur D. Little, Inc. because to my mind Arthur D. Little is not really a patent management organization. It is sort of a hybrid organization in that it functions like Battelle and contributes risk funds up front. This is quite different from the kind of

patent management organization we were thinking about when we wrote the clause. My answer to Arthur D. Little is along this line that the invention rights in our deferred policy or institutional patent agreement policy are left to the institution. Now the institution can pick out its licensees at its own discretion. If I was an institution, I would view Arthur D. Little as a prospective licensee as opposed to a patent management organization. If they are going to make a contribution of risk capital to the bringing of the invention to the market place, then the institution is in a position to license them. The mere fact that Arthur D. Little is not going to be the last licensee is not material from HEW's point of view. What we want to see is the invention get to the market place. So to a certain extent I'm just putting the ball back into Arthur D. Little's court here in that I think it's up to them to decide whether they can live with the conditions of our deferred determinations clause in the institutional agreements and become a licensee in a situation where they are going to risk capital. After their participation has ended they would need to seek out the ultimate deliverer to the public then write their own contract in concert with the university's interests.

Questioner: I would like to know more about Dr. Dvorkovitz and Associates. Since they indicate there is no cost to the university, I think they need to tell us just exactly where the money comes from, when the university is bound, and when the potential licensee is bound to Dr. Dvorkovitz. How are they limiting the marketing capability of the university when this information gets into their system? In other words, we need to know just what kind of a brokerage agreement this is. What are your relationships with the industry people who look at your data bank?

Mr. Dahlbo: Well, actually there were several questions asked. First of all the university is not committed to us on any kind of an exclusive basis such that they lose any of their options. Throughout the world in our relationships with various sources of technology we do have different kinds of relationships. In some cases we have exclusive agreements whereby the licensor agrees that we will be the exclusive agent acting on his behalf. This is still not an agency agreement in the legal sense of an agent whereby we can bind anyone. However, with the universities we have taken the approach that we do not expect to limit them. We view it rather in a practical way. If we do a successful job for any source we think they will be willing and eager to work with us in the future. So it's put on a basis that if we perform for them they will probably want to give us new things in the future. If we get them at an early enough stage, we'll do a good job for our clients in bringing it to their attention, giving them the lead time they want. So as far as the commitment on the part of the university is concerned, none of your options are given up. You are free to make direct contacts if you want to. Now, on the industrial side, again we have different types of agreements with different industries. We have different types of services with these people depending upon how they contract with us. So in some cases some of the companies want to receive things first before its given to others and we explain this to our sources. In other cases, people contract for service in which they may receive the information at the same time that other people do throughout the world. In other words, it's a general information service in that case. So the commitments on the side of industry vary considerably according to the kind of service they want from us, but the commitments on the side of the licensor, in the case of the university,

are clean cut. Nobody is committed to let only us work on their behalf. You do not give up your rights to make direct contacts if you want to. Negotiations are normally conducted directly between you and the licensee although we are willing to help if we are requested.

Dr. Tyler: Bruce had told me several years ago that they have an office in Vienna and an expert who travels behind the Iron Curtain and represents them, and one of their objectives is to exchange technology with companies and perhaps universities behind the Iron Curtain with the Western World. So there are two questions: (1) Are these countries generally honoring the International Patent and License Agreements that prevail in the rest of the world? and (2) Has this been effective in the sense that any appreciable amount of technology has been transferred in either direction?

Mr. Dahlbo: I would answer the first part of the question by saying first of all that we're not, I am certainly not a lawyer or a patent attorney and our company is not in that field so I couldn't comment on some of the fine points about to what extent they honor the Patent Agreements and Patent Laws of the conventions. As far as I know, in general, they do. The extent to which technology transfer actually takes place, in one direction or another, though, is governed by other things, economic conditions and what not. In general, in talking from our viewpoint, we have been more successful in getting technology from the Socialist countries to license elsewhere than we have been able to get it from elsewhere and bring it into the Socialist countries. This isn't too surprising because in many cases they have invested their money in heavy industry and in that case there is no function served by a middleman. If they

want to put up a better steel mill, they know where to go. Or if it is a huge chemical complex, they know where to go. So they don't go through a middleman in that case. The other thing is that they work on a 5-year plan, and so on, with certain programs. They know what they want to do next and in general, they know where they want to go to get it. It is very hard to take something new, go to a Socialist country, no matter which country it is and try to sell them in the sense we are accustomed to in this country. To promote an idea, that is, to get them to start something new isn't part of their psychology, it isn't part of their viewpoint. While they do have a lot of research and a lot of very interesting things making it possible for us to get technology from there and bring it back, in all honesty I would hate to say that we could make a living on what we have been able to license in the other direction.

Questioner: In view of the comments with regard to the estimated market potential of inventions and discoveries being relatively high, what happens to these inventions and discoveries that are far less than two million dollars annual sales, the sum total of which may provide a college or university with a portfolio of a lot of small hits rather than one large one?

Dr. Marcy: Naturally, one wishes to talk about successes and the big things because it is more dramatic. I would say that most of the inventions that we handle are in the $50,000 a year category or under in terms of numbers. Now, one has to have a royalty income.

Questioner: We are talking now, primarily, about sales. I think the figure of two million dollars a year annual sales was mentioned. Project that if you can in terms of royalties. What would that be?

Dr. Marcy: In terms of dollar income, if you're talking about two million dollars in sales at 5% income that's $100,000, isn't it? Now if you are talking about one that only commands 2% royalty income, why then of course the sales would be that much more to get that $100,000. It is very difficult for us at least to think in terms of sales and use that as a criterion. We tend to think in terms of royalty income we can get because that's what the university is really interested in and what we are interested in.

Mr. Dickerson: Could I add something? Remember I told you our criteria was 10 to 1 income to us. If we put $10,000 into something we hoped to get out of that 10 times $10,000 over the life of the patent, whatever it is - $100,000. So you can't go, we don't go as Dr. Marcy says, based on sales alone except that you've got to guess at the sales to figure out what your potential royalty income will be.

Dr. Johnson: I guess I used the two million dollar sales figure. That was only to indicate that the market should be a good sized market and not a small one. We have licensed things that bring in two thousand dollars a year and it takes almost as much time and almost as much money and just as much risk as to get $2,000 a year of which, in this case, the university would get $1,000 as it does to handle something with a much higher potential. Of course you are right, you are thinking in terms of how much royalty it brings,

but the two million dollar sales figure is just to give an indication that it should be good sized.

Mr. Stam: I have a comment: I think the university community, in our particular case, has a high statistical success in licensing and a low royalty income. We are serving two functions for the federal agencies who sponsor us, and for essentially the local business community, by transferring this technology because they are making instruments for which there is a need but a small market, with serving a business function for small business, to which maybe a $50,000 increase in its cash flow is significant and, we're seeing to it that these little inventions, which may significantly contribute to the advance of commercial products available, do reach the market place. Maybe this is one area where the university acting on its own, in its own area, can fill a vacuum left by development outfits, no matter how altruistic, who necessarily have placed a minimum on what they will handle.

Dr. Marcy: Well, I would like to make a comment on that comment. In our case, we think in terms of just recouping the money spent. If we can see that over the life of a patent we are going to spend $10,000 and we can see that we'll get $10,000 back, we'll pick it up. We don't want $100,000 back on that $10,000 investment because in a way, which is perhaps different from the other people here, we again identify with exactly the problem that you are talking about, Lee, that it's important for the university to recognize its obligation to federal granting agencies and put people in the businesses. This is the thing to do. We have actually patented things where there is no hope of getting licensing income back just for that very reason.

Mr. Dahlbo: I guess we're somewhat different than the others in the sense that we take a statistical approach and, frankly, through the years we found it's very difficult to predict what will succeed and since we are not development people ourselves, we often don't know what the market potential may be on different inventions so we end up handling many different types of inventions. By the nature of our business we have to put our time into it to try to get a licensee and then what happens at the end of that is that some generate a lot of money and some don't generate very much. But we don't find that out until afterwards.

Dr. Freise: I'd like to ask the panel if there is any feeling that a lot of what is submitted to you people by universities is really not going to be usable technology? That is, if the university has any expertise at all it can probably recognize the really big patent. If it is something that does not require large amounts of development the university will probably proceed on its own. It's the smaller ones that they are not sure about that may be submitted to Research Corp. or Battelle or given to Dr. Dvorkovitz to put into their data bank. Our survey indicates that the institutions working on their own appear to be doing somewhat better statistically than the general figures quoted by the companies. I have a feeling that it is because you don't follow the small ones that the university may follow and secondly, you may not get the good ones?

Dr. Marcy: This is kind of an aside before I give you an answer, but yesterday you showed in your report you have a list of 100 universities that you contacted and I think you made the statement that something like 40 of these also had agreements with Research Corp., is that right?

Dr. Freise: Of the 50 that responded, 42 had agreements with Research Corp.

Dr. Marcy: Oh, then I missed the point. And my comment is not really germane. But I took your list of 100 schools and I counted how many actually do have agreements with Research Corp., and it was 80 of them. Now, not all 80 of these are submitting invention disclosures through us at the same level of activity. Some schools of those 80, we never hear from. Now either they don't recognize that they have an agreement with us, they don't remember it, or the person who negotiated the agreement with us has left and nobody has replaced him or something like that has happened. Many of the schools submit one or two inventions in the course of a year. Now this is ridiculous from a university that has four or five or ten million dollars worth of research grants. There are other universities that submit something in the order of 35 or 40 to us a year. Now, I think this goes right back to defining an invention and how you recognize it at the university level. My feeling is after working with a number of universities that the university people themselves, including the inventor, do not recognize an invention when they see it, and also they do not recognize whether they have done work that is sufficient to make an invention. The inventive properties in a scientific discovery may not relate at all to what the guy was working on or thought he was working on. it may be entirely peripheral. It takes somebody with some experience and expertise in identifying an invention to tell whether something is worth looking into or not. And that's where Lee Stam's strong point is. He can take what is pre raw data from people at Cal Tech and he can give it one quick look

and say, "This is inventive," and "This is not." Whereas I think that in many schools it is not even recognized that you need to do that. So when you try to generalize on the basis of a survey such as you did, I think it's almost impossible to draw any valid conclusion unless you know one heck of a lot more detail about how the inventions surface at the university. And it is this point that we are trying to approach in our NSF studies we are going to be doing.

Dr. Johnson: Well, I have just one comment on small income and large. Historically, whether it is NRDC in England, Research Corp., Battelle, or Arthur D. Little, whoever does this, there are one or two, maybe at the most, three inventions, that power the whole thing, and all of the rest of them are of practically no importance. So it's kind of a numbers game. If you see 10,000 different inventions then the chances of your getting a bid are 10,000 times better than if you only see one. And, I suppose what you try to do is to be sure that you don't miss the important invention.

Mr. Dahlbo: I wonder if there is any concern about the success of this? That is, the more successful a university may be in a monetary sense with its inventions, won't there be an increasing detraction away from basic research at that particular university? That is a question for the panel as well as anyone in the audience.

Dr. Marcy: Well, there is always a danger of this. It is very interesting to work with an inventor who for 20 years has been altruistically oriented and thinks that patents are dirty. To have him make an invention that suddenly

turns out to be a million dollar invention overnight, it is interesting to see him switch 180 degrees, and it almost invariably occurs. So you've got to be careful how you treat the inventor, if you really want to retain him on your faculty after he has made his invention, whether he is going to have any value to you or not. We had an inventor once recently who was in a chemistry department, had a very good reputation, and commanded something in the order of $200,000 worth of federal grant money a year from various agencies. He had something like ten or twelve doctoral students working for him and about ten or twelve post-doctoral students working for him. He was really Gung Ho. He made an invention and he said, "Gee, this is such a simple invention. I know how to exploit this all by myself." And so, in due course, we arranged with him to exploit his own invention. But when he said that to me I turned to the university administrator and without the inventor knowing it, I said, "Well, now they're going to have to make a decision sometime down the road. Either he is going to be a college professor for the rest of his life or he is going to go off and be an entrepeneur." And the response I got from the administrator was, "Oh no, we can control this." Well as sure as shooting, after two years he stopped being a college professor and now is a businessman. And this happens, and you can't help it, human nature being what it is, with most people. So, you've got to take this. What you do about it is up to the university, and I think that the inventor will solve the problem for you by quitting the university because as soon as he gets the smell of the green stuff in his nostrils, he is lost.

# A NOTE ON THE INFORMAL DISCUSSIONS OF OCTOBER 16, 1974

As indicated in the preface, a primary function of the conference was to stimulate a maximum of personal interchange between all the participants. To promote this kind of communication, the final afternoon session was divided into separate concurrent groups each intended to address in further detail the subject matter initiated by the four panels. These meetings were completely unstructured and allowed the conferees either to remain at one meeting or leave one and attend another to seek additional information or to discuss specific problems.

Due to the informality and the highly specific subject matter of the discussions, no attempt was made to record these particular sessions for the Proceedings.

# APPENDIX

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BETSY ANCKER-JOHNSON

Dr. Ancker-Johnson is Assistant Secretary, Office of Science and Technology, U. S. Department of Commerce. Born in St. Louis, Missouri, she received her undergraduate training in physics at Wellesley College. Her doctoral studies in physics were completed at Tuebingen University in Germany. She had had extensive experience in teaching, industrial research, and executive management prior to joining the Government in 1973.

Her professional activities include the authorship of over 60 scientific papers and the holding of several patents, issued or pending. She has served as a referee for Physical Review Letters, Physical Review, Applied Physics Letters, Journal of Applied Physics, Proceedings I.E.E.E., Electron Device Transactions, and an advisor to the National Science Foundation, and the National Research Council. She was a member of the National Advisory Committee on the U.S.S.R. and Eastern Europe of the Office of the Foreign Secretary, National Academy of Sciences. In the American Physical Society, in addition to serving as a Councillor-at-large, she has been a member of the Executive Committee, the Committee on Women in Physics, and the Committee on Minorities. Other affiliations include membership on the National Advisory Committee on Oceans and Atmosphere and participation as a regional panelist on the President's Commission on White House Fellows. She is a member of Sigma Xi and Phi Beta Kappa. Dr. Ancker-Johnson is a trustee of Wellesley College and has been an invited lecturer at Ohio State University and before the New York Academy of Science.

# UNIVERSITY PATENT POLICY QUESTIONNAIRE

1. What office and/or university official has responsibility for administering your patent policy?

   _____

2. How is the decision made on whether to obtain a patent?

   _____ Faculty Patent Committee

   _____ By outside consulting firm (such as Battelle or Research Corporation)

   _____ By University Patent Administrator

   What University Rank? _____

   _____ By Professional Patent Promotion Consultant

   _____ Other _____

   _____

3. How is the patent program staffed within the university and what percentage of time does each devote to the program? (Use "professional" categories, e.g. engineer, lawyer, secretary, etc.)

   A _____

   B _____

   C _____

   D _____

   E _____

   F _____

4. What type of firms outside the university are used in the patent application program (e.g. patent attorneys)?

   _____

5. Which outside firms does your institution use to promote patents and inventions?

   _____ Research Corporation

   _____ Batelle

   _____ None

   _____ Other _____

6. a) Number of Disclosures processed per year _____

b) Number of Patent Applications filed each year _____

c) Number of licenses processed per year _____

7. How are the expenses incurred in the University Patent Program covered? (percentages)

_____ From Royalties

_____ As an indirect cost item

_____ As a direct contribution from the University

_____ Other _____

8. a) (Optional) What is the estimated annual cost of administering the university's Patent Program? _____

b) (Optional) What is the approximate royalty income to the University from patents and inventions? _____

c) (Optional) What is the average percentage of in-house development? _____

9. Is your institution interested in reviewing the results of this survey? Yes _____ No _____

_____

_____

Name and title of official responding to questionnaire

Please return to:

Dr. Earl J. Freise
Office of Research & Sponsored Programs
Northwestern University
633 Clark Street
Evanston, Illinois 60201

*SAMPLE -- TYPICAL LICENSE INCORPORATING NIH AGREEMENT*

APPENDIX D

LICENSE AGREEMENT

AGREEMENT made this day of , 1972, between THE REGENTS OF THE UNIVERSITY OF MICHIGAN (hereinafter referred to as "LICENSOR") whose principal office is located at Ann Arbor, Michigan, and (hereinafter referred to as "LICENSEE") a corporation organized and existing under the laws of , having a place of business at

WITNESSETH THAT:

WHEREAS, LICENSOR is the owner of U. S. Patent Application Serial No. , filed , relating to certain compounds useful in medical diagnosis; and

WHEREAS, the United States Government, through its Department of Health, Education and Welfare, has provided monetary support for the work which led to the Invention disclosed and claimed in said Patent Application; and

*NOTE: INDICATIVE NIH SPONSORSHI*

WHEREAS, LICENSEE desires a license to manufacture, sell and use "Licensed Product" as defined hereinafter, and LICENSOR is willing to grant such license under the terms and conditions, hereinafter stated;

NOW, THEREFORE, in consideration of the above premises and the covenants contained herein, the parties hereto agree as follows:

Article I - Definitions

The following terms, as used in this Agreement, unless the context clearly indicates to the contrary, shall have the meanings set forth in this Article:

a) The term "Licensed Patent Rights" shall mean any patent issuing on U. S. Patent Application, Serial No. filed , any divisions, continuations, continuations-in-part and foreign counterparts of the same, as well as any other patents relating to compounds owned or controlled by LICENSOR which are based on inventions made withing three (3) years of the date of this Agreement.

b) The term "Licensed Products" shall mean any products claimed in the Licensed Patent Rights or whose manufacture or use is covered by claims in the Licensed Patent Rights.

c) The term "Licensed Territory" shall mean: the United States and other countries in which there exist any Licensed Patent Rights.

d) The term "Net Procees of Sales" means the gross sales of Licensed Product sold pursuant to this license less allowances to customers for spoiled, damaged, outdated and returned goods and the amounts of discounts, transportation charges and all sales and excise taxes or duties paid, absorbed or allowed together with all other allowances and adjustments actually credited to customers, directly or indirectly. No royalties shall be payable on sales between LICENSEE and its Affiliates.

e) The term "Affiliate" means: (i) any business entity which LICENSEE shall own or control, or which shall own or control LICENSEE, or which shall be under common ownership or control with LICENSEE; and (ii) a business entity licensed by LICENSEE to sell Licensed Products under the label.

f) The term "Exclusive Period" shall mean, with respect to any country within the Licensed Territory, the period of time during which no Licensed Product is, in fact, marketed or otherwise supplied in such country by others than LICENSEE, its Affiliates and/or its sublicensees.

## Article II - Grant of Licenses

Subject to the terms and conditions hereinafter set forth, LICENSOR hereby grants to LICENSEE and its Affiliates:

a) A right and license under the Licensed Patents to manufacture and/or sell the Licensed Products in the Licensed Territory, said right and license to be exclusive, as to each country within the Licensed Territory, for a period to be negotiated but in any event not less than five (5) years from the date of the first commercial sale of a Licensed Product in that country by LICENSEE, its Affiliates or its sublicensee. The right and license thus conveyed shall include the right to sublicense others, and to prosecute, at LICENSEE's own expense, infringers of the Licensed Patents.

b) No license is granted by this Agreement, either expressly or by implication under any patent rights owned or controlled by LICENSOR, except as provided herein.

## Article III - Royalty

a) At the times and in the manner set forth hereinafter, LICENSEE or its Affiliates shall pay to LICENSOR in United States funds, five percent (5%) of LICENSEE's and its Affiliates Net Proceeds from Sales of Licensed Products manufactured and/or sold in a Licensed Territory during the Exclusive Period and two percent (2%) of LICENSEE's and its Affiliates Net Proceed from Sales of Licensed Products outside the Exclusive Period for the term of this Agreement.

b) If LICENSEE sublicenses another firm, then LICENSEE shall pay LICENSOR one-fourth (1/4) of any royalties received by LICENSEE from such sublicensees.

c) In the event and for so long as LICENSEE's or its Affiliates' sale of Licensed Product under this Agreement reasonably requires that LICENSEE or its Affiliates become licensed under the patent of a third party, LICENSEE and its Affiliates shall be entitled to deduct the amount of any royalties paid or payable under such license from payments then or thereafter due to LICENSOR under this Agreement.

d) If LICENSOR hereafter grants rights to another in a country of the Licensed Territory on terms or at a royalty rate more favorable than the terms or royalty rate given LICENSEE or its Affiliate under this Agreement, LICENSOR shall promptly notify LICENSEE, and LICENSEE and its Affiliates shall be entitled to the benefit of such more favorable terms or rates as to said country, commencing at the same time they are available to such other party.

## Article IV - Reports and Records

a) LICENSEE or its Affiliates shall render to LICENSOR within sixty (60) days after the end of each calendar quarter a written account of all sales of Licensed Products made by it and its Affiliates during such quarter, and shall simultaneously pay in United States dollars to LICENSOR the royalties due with respect to such sales under Articl III hereof.

b) LICENSEE and its Affiliates shall keep full, true and accurate books of accounts and other records containing all particulars which may be necessary properly to ascertain and verify the royalties payable by

them hereunder. Upon LICENSOR's request, LICENSEE and its Affiliates shall permit an independent United States Certified Accountant selected by LICENSOR (except one to whom LICENSEE has some reasonable objection) to have access during ordinary business hours to such of LICENSEE's or its Affiliates' records as may be necessary to determine, in respect of any quarter year ending not more than two (2) years prior to the date of such request, the correctness of any report and/or payment made under this Agreement.

c) All royalty payments required to be made by LICENSEE and its Affiliates under this Agreement shall be determined in the national currency of the country where the sale on which the royalty is based was made, unless otherwise agreed to by the parties on a country-by-country basis. The royalty payments accruing on sales by LICENSEE or its Affiliates in any country shall then be converted to United States currency at the rate of exchange legally obtainable in each country on the date royalties are payable, and payment shall be made in United States dollars to the account that LICENSOR indicates. Should the payment of the amount of royalty or the manner of payment provided in this Agreement be prevented in any country by Government regulation, LICENSOR agrees that LICENSEE or its Affiliates can satisfy its obligations under this Agreement as to said country by paying the legally permitted amount of royalty in the legally permitted manner.

## Article V - Patents

a) LICENSEE agrees that it will, at its own expense, prepare, file and prosecute those patent applications relating to Licensed Products under which LICENSEE desires to be licensed, said patent applications to be assigned to LICENSOR.

## Article VI - Duration and Termination

a) This Agreement shall become effective upon the date hereinabove written, and, unless it is sooner terminated in accordance with any of the provisions herein, it shall remain in full force and effect for the life of Licensed Patent.

b) LICENSEE may terminate this Agreement in its entirety, or on a patent-by-patent or country-by-country basis, by giving LICENSOR written

notice at least three (3) months prior to such termination.

c) In the event that either party defaults or breaches any of the provisions of this Agreement, the other party shall have the right to terminate this Agreement by giving written notice to the defaulting party, provided however, that if the said defaulting party cures said default or breach within sixty (60) days after said notice shall have been given this Agreement shall continue in full force and effect. The failure on the part of either of the parties hereto to exercise or enforce any right conferred upon it hereunder shall not be deemed to be a waiver of any such right nor operate to bar the exercise or enforcement thereof at any time or times thereafter.

d) Upon the termination of this Agreement by LICENSOR for any cause LICENSEE may notify LICENSOR of the amount of Licensed Product LICENSEE then has on hand, and LICENSEE shall then have a license to sell that amount of Licensed Product, but no more, provided LICENSEE shall pay the royalty thereon at the rate and at the time provided for.

e) If during the term of the Agreement, LICENSEE shall become bankrupt or insolvent or if the business of LICENSEE shall be placed in the hands of a receiver or trustee, whether by the voluntary act of LICENSEE or otherwise, this Agreement shall immediately terminate.

f) Termination of this Agreement for any cause shall not release either party from any obligations theretofore accrued.

Article VII - Department of Health, Education and Welfare

*NOTE: INCORPORATING THE NIH AGREEMENT INTO THE LICENSE.*

It is the understanding of both parties that the licenses granted hereunder are subject to the conditions and requirements established by the United States Department of Health, Education and Welfare annexed hereto as Appendix A, and which are to be considered part of this Agreement.

Article VIII - Law to Govern

This Agreement shall be interpreted according to the laws of the State of

Article IX - Notices

Notice hereunder shall be deemed sufficient if given by registered mail, postage prepaid, and addressed to the party to receive such notice

at the address given above, or such other address as may hereafter be designated by notice in writing.

Article X - Assignment

This Agreement shall be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed in duplicate by their duly authorized officers as of the day and year first above written.

THE REGENTS OF
THE UNIVERSITY OF MICHIGAN

By_____

# PATENT LICENSE AGREEMENT

LICENSE AGREEMENT effective as of March 1, 1973, between Regents of THE UNIVERSITY OF MICHIGAN (hereinafter "UNIVERSITY"), whose address is Ann Arbor, Michigan 48104, and THE SPORTEQ COMPANY, a Delaware corporation (hereinafter "SPORTEQ"), having a principal place of business at 225 Franklin Street, Boston, Massachusetts 02110, whereby it is agreed as follows:

1. Definitions

(a) "Licensed Patent(s)" shall mean U. S. Patent No. 3,462,763 and any reissues, extensions and renewals of same, and any Further Patents which SPORTEQ may elect to add to this License.

(b) "Further Patents" shall mean any Patent owned or controlled by UNIVERSITY claiming an invention in protective helmets useful in the fields of football, hockey, baseball, boxing, wrestling, rugby and lacrosse.

(c) "Licensed Product" shall mean any recreational helmet falling within the scope of any unexpired claim of a Licensed Patent or the manufacture of which helmet involves the practice of any unexpired claim of a Licensed Patent.

(d) "Net Sales" shall mean total billings less any freight charges, taxes or discounts reflected on the invoice and less returns and allowances.

2. Grant

UNIVERSITY hereby grants to SPORTEQ a license under Licensed Patents to make, have made for it, use and sell Licensed Products, which license shall be exclusive in the field of football, hockey, baseball, boxing, wrestling, rugby and lacrosse helmets. SPORTEQ shall have the right to sub-license any controlled affiliate which accepts in writing the terms of this Agreement. To the extent that the license is exclusive, SPORTEQ shall have the right to sue infringers, to retain recoveries therefrom, and to grant Licenses in settlement of infringement suits upon such terms and conditions as it may deem fit, provided that any prospective Licensee under this section is not controlled directly or indirectly by SPORTEQ . UNIVERSITY shall have the right to be represented by its own counsel at its own expense in any litigation involving Licensed Patents.

3. Royalties

*NOTE: DIFFERENCE IN ROYALTY SCALE*

For the License granted SPORTEQ agrees to pay a royalty of 5% of Net Sales of Licensed Products sold as football or hockey helmets. The royalty rate on Licensed Products other than football and hockey helmets shall be 2%.

NOTE: SPECIAL CONSIDERATION FOR THIS AGREEMENT; NOT OFFSET BY FUTURE ROYALTY PAYMENTS.

SPORTEQ also agrees to pay UNIVERSITY, upon execution of this Agreement the sum of $20,000. Unless additional payments of $20,000 each are made on June 1 and September 1, 1973, this Agreement may at the option of UNIVERSITY be terminated by written notice.

4. Reports and Payments

Within 30 days after the end of each calendar quarter, SPORTEQ shall submit to UNIVERSITY a written report setting forth the Net Sales of Licensed Products sold during said quarter accompanied by payment for the royalties accrued in such quarter SPORTEQ shall also remit to UNIVERSITY 40% of any royalties received in said quarter from sub-Licensees not controlled by SPORTEQ.

SPORTEQ shall retain and require its sublicensees to retain records relating to the sale of Licensed Products for at least two years for inspection by UNIVERSITY'S representatives at all reasonable times for the sole purpose of verifying SPORTEQ'S reports and payments under this Agreement.

5. Ownership and Further Patents

UNIVERSITY represents and warrants that it is the owner of Licensed Patents and has the right to grant this License. UNIVERSITY further represents and warrants that it is not aware of any patent other than a Licensed Patent which would be infringed by the manufacture, use or sale of any Licensed Product. SPORTEQ may, at its election, by written notice add to its agreement as a Licensed Patent any Further Patent owned or controlled by UNIVERSITY, without any increase in the royalty specified in Section 3. Neither SPORTEQ nor any controlled subsidiary of SPORTEQ nor any customer of either shall have any liability with respect to any Further Patent owned or controlled by UNIVERSITY until and unless UNIVERSITY shall have given SPORTEQ written notice of such Patent and SPORTEQ shall have failed to add such Patent as a Licensed Patent within 90 days after such written notice.

6. Infringement

In the event of any litigation against SPORTEQ or any controlled affiliate of SPORTEQ, based upon a claim that a Licensed Product infringes any claim of a patent owned by a third party, which claim is supported by the disclosure of any Licensed Patent, during the period of such litigation SPORTEQ may withhold any royalties due UNIVERSITY hereunder or other payments which may be required to preserve the

character of the License herein granted and apply the same against attorneys' fees, damages, costs and other out-of-pocket expenses incurred in such litigation, the balance of any money so withheld to be paid to UNIVERSITY not later than 90 days after the termination of such litigation.

7. Term

(a) Unless sooner terminated, this License shall continue in force until the date of expiration of the last to expire of Licensed Patents.

(b) Either party may terminate this Agreement by breach by the other if such breach is not cured within 90 days after written notice thereof.

*NOTE: ASSURANCE THAT LICENSEE WILL ACTIVELY PURSUE THE MANUFACTURE.*

(c) If SPORTEQ is not actively pursuing commercialization of the football helmet within 1 year from this date, UNIVERSITY may terminate this license by written notice and SPORTEQ shall have no right to recover any money paid to UNIVERSITY. Criteria which determine the seriousness of Licensee's commercialization interest will be either a commitment for production tooling or the continuance of an actively funded R&D program.

8. Assignment

This Agreement may be assigned by SPORTEQ to any successor in interest to its business in Licensed Products.

9. Notices

Any notice given under this Agreement shall be considered sufficient if sent by certified mail, return receipt requested, to the address specified in the preamble of this Agreement or to such other address as may be specified from time to time by the parties.

This Agreement shall be deemed to have been negotiated, made and performed in Michigan. It shall therefore be construed, interpreted and the respective rights of the parties hereto shall be determined and enforced in accordance with Michigan law.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed by their representative duly authorized officers on the dates indicated.

APPENDIX E

## A SHORT BIBLIOGRAPHY OF SIGNIFICANT PUBLICATIONS

(1) Patents at Colleges and Universities, by the Committee on Governmental Relations NACUBO (1974). Copies are available on request from the Committee on Governmental Relations, NACUBO, One DuPont Circle (Suite 510), Washington, D. C. 20036.

A publication designed to present guidelines to aid institutions in formulating patent policies.

(2) Handbook of College and University Administration - Academic (Volume 2), prepared by Asa S. Knowles and is available from McGraw-Hill Book Company.

Pages 105-127 of this volume deal with guidelines to aid institutions in their formulation of patent policies. It also presents a basis or rationale for the policy's existence.

(3) What to Do in Case of an Invention, prepared by the Division of Industrial Development and Research of the University of Utah.

An outline of what steps the inventor should take in the initiation of the patent process.

(4) Patents and the University Inventor, prepared by Research Corporation, 405 Lexington Avenue, New York, New York 10017.

Summarizes for the inventor the value of the patent process and the relationship that should exist between patents and publications.

(5) General Information Concerning Patents, U. S. Department of Commerce, Patent Office. Available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

A brief introduction to the subject including how the Patent Office works, what applicants must do, and a definition of patents, copyrights, and trademarks.

(6) Patents and Inventions: An Information Aid for Inventors, U. S. Department of Commerce, Patent Office. Available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

A step-by-step guide to help the inventor decide whether to apply for a patent, how to obtain patent protection, and how to promote his invention.

(7) A Primer of U. S. Patent Law, written by William J. Mase and published in The Resource (May, 1971 No. 6). Available from Battelle Development Corporation.

Provides the reader with a general framework from which the patent process develops. It also develops some basic criteria for the identification and evaluation of possible inventions.

(8) Evaluating and Patenting Faculty Inventions, prepared by Research Corporation, 405 Lexington Avenue, New York, New York 10017.

Develops various topics which should be considered in patent evaluations.