DEVELOPING PATENT AWARENESS AT EDUCATIONAL INSTITUTIONS

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At the last meeting of this organization in Milan I described a proposed procedure for developing an awareness of patents and the use of the patent system at educational institutions in the United States. A test of the procedure at eight such institutions had been funded by the National Science Foundation and was just about to begin at the first institution.

Briefly the operating procedure included basically three steps:

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

.... an educational phase involving seminar presentations by Research Corporation associates to administrative officers and to science-oriented faculty researchers.

.... a period of continuing intensive support provided by visits on an individual basis with the researchers following the seminars.

This procedure was designed to develop an understanding by faculty members of the entire process of innovation with particular emphasis on the recognition of inventive concepts and their further development using the patent system.

Paper given at Conference of National Research Development Organizations, Paris, France, 17-18 June, 1976.

Measurement of the success of the experiment was to be made by comparing the quantity and quality of invention disclosures before and after "Seminar Week".

Finally, a comprehensive report of the results obtained was to be written, and a "do-it-yourself" manual was to be prepared for use of the procedure by others.

Selection of Institutions and Scheduling

The institutions were selected using a variety of criteria. A primary consideration in the selection was the amount of direct Federal funding which had been made available for scientific and engineering research. The type of general institutional support - whether publicly or privately derived - was also a major consideration. The size of the institution and diversity of studies offered were of prime importance. The degree of cognizance and understanding of the administration and faculty in patent matters and the innovation process were taken into account. Other less important factors were also considered.

Descriptive information concerning the institutions finally selected is given in Table I.

The entire project was scheduled to require three years, and, thus, will not be completed until about June 1977. Each institution was to be studied over a two-year period with data analysis and report writing occupying the remaining time.

Initial Preparations

In initiating the program at each institution preparations are begun at least two months before the dates set for the seminars. These preparations include several one or two-day visits by the Research Corporation associate assigned prime responsibility for the specific institution. The purpose of these visits is to discuss in depth the details of the next two year's activities with both the top academic and business administrators and those who will be carrying the major day-to-day effort during this time. On the same visits the associate endeavors to obtain as much detailed information as possible about the institution itself. Important are such items as size, composition and research interests of the science-oriented faculty, amount and distribution of funding, types and distribution of in-house publications concerning research at the institution, and a listing of the publications of research results. Using this information and with the help of the administrators a detailed plan for "Seminar Week" is prepared.

Preseminar Activities

Since the seminars presented the first opportunity for personal contact with faculty members, careful preparation was undertaken. With the close cooperation of the designated administrative contact officer plans were carefully laid several weeks in advance of the selected "Seminar Week".

The head of each department or school was interviewed personally in order to enlist his interest in the overall program and to plan with him the time and place for the seminars. He was encouraged to invite

personally each faculty member to attend the appropriate seminar and to arrange to have the detailed schedule posted on the departmental bulletin board.

A copy of the seminar schedule was sent by the administrative contact office or department head to each faculty member in each department.

Wherever possible arrangements were made to have the seminars announced in the local news media - in the campus and local town newspapers, and over the campus and local town radio. Interviews with selected faculty members and with Resesach Corporation associates were also published or broadcast, if this could be arranged. Brief articles on the program and describing the patent system and the patent awareness concept in general were distributed or submitted for local publication.

Preseminar interviews with selected faculty members requesting their help in publicizing the seminars were held.

In one case it was possible to arrange for the seminar program to coincide with the wide distribution of a newly revised institutional patent policy.

Seminar Content

In an Appendix to this talk the latest revised version of the content of the seminar lectures is given. Slides are available for use in the presentation, but, at the discretion of the lecturer, are not

always used. The slides are reproduced in the printed seminar outline, a mechanism that has proved very valuable as the slide content highlights the important ideas which provides subsequent reference for the attendee and for transmittal to others who could not attend.

An important component of the seminar outline is the listing of the appropriate local contact as a source for further information or action, and a questionnaire which gives the attendee an opportunity to direct his thinking towards inventions and their further development using the patent system. The filled-in questionnaire affords the Research Corporation associate an excellent opportunity to initiate later discussions.

Seminar Procedure

The seminars begin with a brief personal introduction followed by a lecture presentation. This requires about 30 minutes.

The meeting is then opened for questions which are answered as completely as possible. After another 30 minutes the attendees are invited to fill in the questionnaire, at their discretion, and to remain for further questions and answers, if they desire.

The seminar meeting rooms are located geographically as close as possible to the offices and laboratories of the expected faculty attendees. If feasible, the seminars are scheduled for a regularly scheduled faculty seminar period, or at a "brown-bag" luncheon meeting. The seminars are conducted as informally as possible, although some structure is necessary.

If an attendee wishes an immediate follow-up, the lecturer makes an appointment for an early personal interview. Otherwise, personal interview appointments are scheduled for the next visit, approximately one month in the future.

While the institution contact is invited to all the seminars, he may or may not be able to attend. In any event, the results of the seminar, particularly the questions and answers and the filled in questionnaires are discussed with him. In this way he can become acquainted with and handle any urgent matters.

Individual Visit Scheduling

Approximately one month after the seminars are held, one Research Corporation associate returns to the campus two days for personal interviews. The scheduling of these interviews is handled by the administrative contact at the institution. However, it has been found advantageous for the associates to supplement the contact's activities by making arrangements for such interviews directly by telephone or letter. These interviews usually last 45 minutes to one hour at the convenience of the interviewee. About 7 to 10 interviews can be handled per day. While most are conducted during normal working hours, breakfast, dinner and evening meetings are sometimes necessary.

Conducting the Interview

After a few months of experience the interviewer develops a technique for putting the interviewee at his ease quickly and establishes a feeling of confidence and credibility between the two persons. Once this is

accomplished the conversation is steered towards the faculty member's area of research interest and some time is spent in developing general background information. Finally, the specific research which might be worthwhile patenting is discussed. During the interview any reservations, misconceptions and lack of adequate information about inventions, patents and the use of the patent system can be dispelled.

The principal objective of the interview is to obtain a written disclosure of a specific invention. The researcher is encouraged to submit such a disclosure as soon as possible to the administrative contact. It is, of course, not always possible to accomplish this in one interview. If not, additional personal visits are made, as necessary.

Additional Visits

Individual monthly interview visits are scheduled at each institution for a two-year period after the initial seminars. During this period it is expected that a large percentage of faculty members in each department will have been interviewed and that each will have become aware of possible inventions resulting from his research and will be much more familiar with patents and the patent system.

"Mini-seminars" are also being given during the period of continuing visits at the request of one or more researchers. These are usually scheduled on short notice and involve the same material as the more formal seminars. Such meetings serve as refreshers for those who have

heard the initial presentations and as a means for reaching those researchers who either were unable to attend originally or have become interested later.

Results as Measured by Number and Discipline of Disclosures

Table II gives preliminary information on the number and discipline of disclosures received in 1975 and the first three months of 1976. Annual averages over the previous five years are given for comparison. The number of disclosures per million dollars of grant funding has also been calculated.

.... At institutions 2, 3, 6 and 8 the seminars were given in October, November and December 1975. It is interesting to note the sharply contrasting results between institution 2 and 6, and 3 and 8. It is quite obvious that there are distinctly different responses to essentially the same input. The latter two institutions showed an immediate response to the impetus provided by the seminars whereas the former two did not. The reasons for this difference appear to be complex and many, but the main factor seems to be the more favorable psychological attitude at the more productive institutions. In addition at one of the more productive institutions a full-time employee has been assigned to help in getting the program underway.

.... More inventions appear to arise in chemically related fields than in electrical or mechanical areas of technology. At institution 1 a relatively large number of disclosures also appear to be developed

in agriculture and at institution 8 the medical complex seems to be generating many inventive concepts.

.... There appears to be a wide range of disclosures per $1 million funding. At the more active institutions this ratio appears to be about 1.0 whereas at the less active institutions the ratio is about one-third to one-half of that.

A number of other interesting conclusions can be discerned, but, since the data are preliminary and undoubtedly somewhat inaccurate, further discussion is probably unwarranted at this time.

Results as measured by Feedback from Individuals Contacted

.... The reactions of the individuals contacted at the several institutions has varied between extremely favorable and extremely unfavorable.

.... In most cases the high level and low level administrators have been very cooperative and have willingly supplied office space, secretarial help and any other needs of a similar nature. They see this effort as a means for doing their jobs better.

.... It has been a different story with the intermediate level administrators, however. Many of these have been most cooperative, but many have either played a neutral role or have actually hindered or resisted the carrying out of the seminars and visitation program. Moreover, we have found both types in a single institution. In

such a situation effort has been concentrated on those who have been willing to work well with the Research Corporation associate, and have left until later those who were not so inclined. Particularly frustrating has been the attitude of such administrators in one or two medical schools. We have just about concluded that the original approach to these schools will have to be drastically revised before positive results eventuate.

.... The same general comment holds for the individual faculty researcher. In addition to unwarranted unrealistic positive and negative biases, most faculty members have an almost total ignorance of the problems and procedures involved in recognizing inventive concepts and entering into and concluding development of these concepts to commercial products. The approach for overcoming these attitudes has had to be on the most elementary level. It is only fair to say, however, that most faculty researchers have been quick learners, and, once they see the proper objective, can and do become enthusiastic over the possibilities for future accomplishments.

.... Most faculty researchers have an almost total ignorance of the patent policies of their institutions. Without even having read the policy many feel it must be weighted against them. When informed of the terms, most admit the policies are fair and are willing to accept them. Clearing up this point may take some time, however.

Much additional discussion of the differing responses of individuals to this program could be undertaken, but such discussion would be beyond the scope of this paper.

Results as Measured by Perceptions of Research Corporation Investigators

The results as perceived to date by Research Corporation investigators can be summarized as follows:

Seminars

.... Seminars based on the present seminar outline appear to be effective, with or without use of slides. The outline itself is useful for later reference by the researcher himself and for referral to any curious colleagues.

.... The seminar approach is less effective than personal interviews, but is more time-efficient.

.... Seminars are most effective when done on a departmental basis and with the full cooperation of the department head. Attendance at seminars is best when invitations to individual researchers have been extended personally by the department head and by personal mail.

.... With multi-campus institutions holding seminars at the satellite locations is important.

.... Open seminars and seminars for administrators are not effective and were not used after the first institution.

.... While some resentment to filling out the questionnaire attached to the seminar outline was encountered, the completed questionnaires furnish valuable information for assessing audience reaction and generating rosters of names of interested researchers for subsequent use in arranging personal interviews.

Interviews

.... Extensive planning by the interviewer for the interviews is an absolutely necessity. All available sources of information should be used to find the names and interests of those researchers likely to develop inventive concepts. The most fruitful such sources are:

Seminar questionnaires

Published institutional course and faculty bulletins

Newsletters

Departmental brochures and reports

Lists of funding sources

Scientific and technical journals

Referrals by colleagues

.... Good cooperation from the designated institutional administrative contact and his secretary is all-important. This office serves as the focal point for contact between the researchers and the evaluators or those charged with undertaking any further steps to bring inventions into use.

.... Most effective use of interview time is achieved if the interviewer designates for scheduling the names of about twice as many interviewees as he expects to be able to see each day of his visit. A reasonable average number of interviews per day is about 7 to 10.

.... The manner of approaching the researcher is very important. To many researchers certain words seem to be effective "turn-off" words, such as "patents" or "inventions". The most effective approach appears to be to engage the researcher in an in-depth discussion of his research work generally, its goals and how he is

approaching these. Specific details of the work which might include inventive concepts then usually drop out naturally, thus giving an opening to talk about the possibilities for public use through proper use of the patent system.

General Observations

.... The patent policies existing in the institutions under study do not appear to be deterrents to the submission of invention disclosures by the researchers. For the most part faculty members are generally quite uninformed about the provisions of the specific policy which applies at the researcher's institution. However, once these provisions are explained and become understood by the researcher, they seem to be quite acceptable.

.... The patent policies of certain government funding agencies are perceived by some researchers as being deterrents because of unnecessarily bureaucratic procedures and the retention of title to inventions by the Government both of which are perceived to hinder further development of inventive concepts.

.... Most faculty researchers appear to have little or no understanding of the role of patents, the patent system and entrepreneurship in the economy. Most are not interested in inventions and many feel that having patents is merely adding bibliographic references. Because of these attitudes, it is necessary to find ways to bring the merits of such matters into their consciousness. While the usual and acceptable means for absorbing information of this type appears to be through participation in seminars, the interview

technique appears to be the most effective way to establish these new concepts in the researchers' minds.

.... Slow and poor handling of disclosures by either or both in-house or outside administrators have strong negative effects on faculty researchers. Lack of timely communication about further processing of an invention is also perceived in a strongly negative manner.

.... To make a program for developing inventive concepts effective, the most important factor appears to be a strongly positive attitude at the highest administrative level. The positive nature of this attitude must be shown by both word and deed. Enthusiasm for the program must diffuse down through both the lower administrative and academic levels to and including the department chairmen. An outsider with adequate knowledge and dedicated interest in such a program can catalyze both administrators and faculty members into action.

Conclusions

While testing of the proposed patent awareness program is only about half finished, some preliminary qualitative and quantitative conclusions can be drawn concerning its effectiveness. It is quite clear that the approach used can lead to a several-fold increase in the number of invention disclosures submitted for evaluation. However, obtaining this result requires detailed planning, frequent personal contact, and, above all, enthusiasm for the objectives of the program throughout the institution.

Table I

General Information on Each Institution

Institution Number	Major General Support	Total Enrollment	Approximate Number of Science-Oriented Faculty		Annual Amount of Government Support (Million $)	Date of Seminar Week
			Academic	Medicine		
1	Public	22,000	520	None	30	11/74
2	Public	12,000	492	None	6	11/75
3	Public	33,000	400	150	55	10/75
4	Private	5,000	125	None	30	5/75
5	Public	38,000	450	125	45	4/75
6	Private	5,000	120	None	3	12/75
7	Public	55,000	700	100	48	3/75
8	Private	9,000	500	None	29	10/75

None = No Medical Center at this Institution.

Table II

Results as Measured by Number and Discipline of Disclosures

Institution Number	Number of Disclosures: Annual Average (1970-1974)	Number of Disclosures: 1975	Number of Disclosures: 1st 3 Months 1976	Number of Disclosures by Discipline (1975): Chemistry Biochemistry Chem. Engrg.	Physics Electronics Electrical Energy	Mechanical Engineering	Agriculture	Bio-Medical Medicine	Number of Disclosures per million $ Funding
1	7	26	8	10	3	2	11	N.A.	0.9
2	8	7	2					N.A.	1.1
3	6	23	14				N.A.		0.4
4	6	15	3				N.A.	N.A.	0.5
5	10	26	1				N.A.		0.3
6	1	4	3				N.A.	N.A.	1.3
7	5	12	4	6	3	4	1	1	0.3
8	2	30	22	8	5	2	N.A.	15	1.0

N.A. = Not Applicable

INVENTION SEMINAR OUTLINE

Introduction

Testing an hypothesis: Patent awareness will lead to an earlier and more widespread identification of inventive concepts

Basic interest by all federal granting agencies to maximize return on investment in grants dollars

The basic assumptions:

- Inventions can arise from university research
- These inventions can be put to practical use

Techniques to be tested:

- Assist faculty to recognize and disclose inventions
- Acquaint university community with role of patents in innovation

(Slide 1)

PATENT AWARENESS PROGRAM:

FOUR PHASES

- Review of ongoing research
- Seminars
- Continuing support (monthly visits)
- Report of results

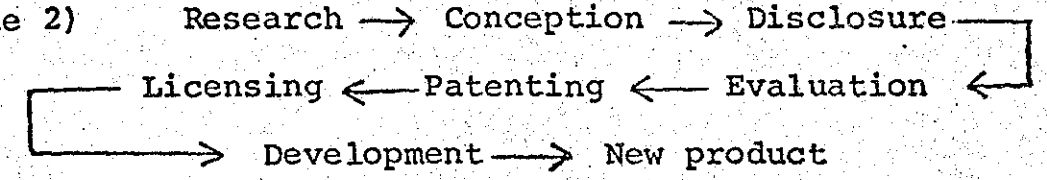
An Overview

Roles of faculty researcher: teach, acquire and disseminate knowledge

Connections between these roles and invention, patents and innovation

THE INNOVATION PROCESS

(Slide 2)



Definitions

- Invention — Something which never existed before
- Patent — A grant by a government to an inventor giving him the right to exclude others from making, using or selling his invention for a definite time period. In the U.S. the grant is given in exchange for a full disclosure of a new, useful and nonobvious invention
- Innovation — The introduction and use of an invention in the economy

Academic research rarely planned to produce inventions, but planned or not they will continue to occur

- There are many examples of academic inventions. Common characteristics: made at a university, covered by patents, licensed to industry, produced financial return

Key events which start innovation process

- Recognition of invention
- Disclosure to others

Recognition

- You, the researcher, are closest and have the first opportunity
- Recognition often depends upon awareness

Making a disclosure

- Provide a written description to your cognizant university office
- Disclosure does not mean telling the public

(Slide 3)

MAXIMS OF ACADEMIC INVENTION

- Inventions can occur
- Recognition is crucial
- Disclosure is a must

Recognizing An Invention

Recognition is a critical step in innovation process

Characteristics of inventions: newness, usefulness

- Either newness or usefulness should alert the researcher
- Not necessary that these characteristics coexist initially

(Slide 4)

AN INVENTION IS

Something new and useful which may be...

- A solution to a problem
- Something that satisfies a need
- A better way of doing something
- An improvement to an existing development

(Slide 5)

THE PROCESS OF INVENTION INCLUDES

- Mental act: the "conception" (an end result and the means to obtain it)
- Physical act: the "reduction to practice" (proving by demonstration that result is obtained)

Good records are vital

- As an aid to recognizing inventions
- As the only acceptable means to establish conception and reduction to practice

Disclosing the Invention

A disclosure is a written description of an invention

- Two functions: explain invention, state its use

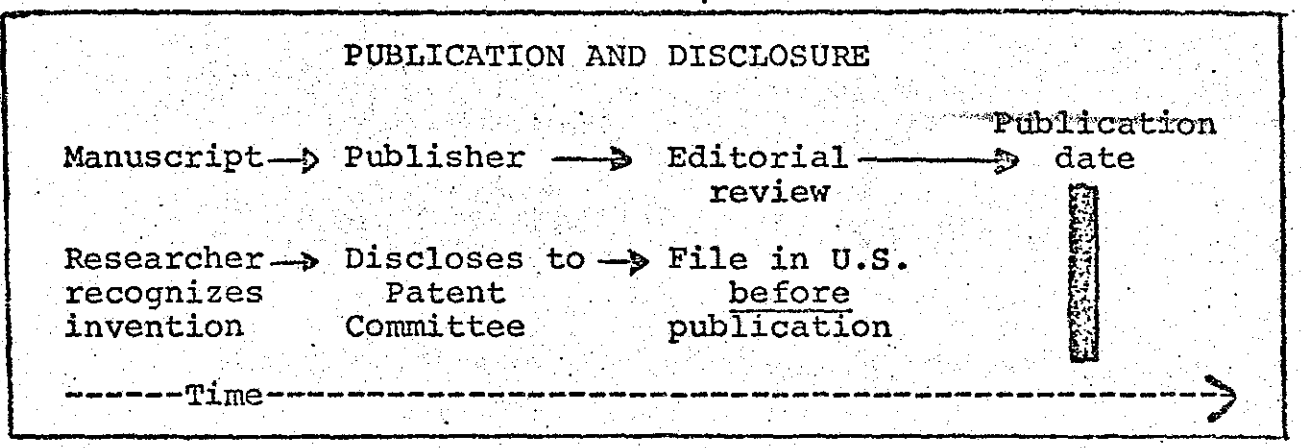
No formal requirements for disclosure

- Manuscript or article
- Written description if no manuscript
- Questionnaire

The time to disclose

- Immediately after inventive act complete
- Latest optimum: when submitting manuscript to publisher

(Slide 6)



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IN PATENT LAW, "PUBLICATIONS" ARE WORKS

AVAILABLE TO THE PUBLIC AND INCLUDE --

- Articles in lay or scientific press
- Books or conference proceedings
- Theses, when catalogued
- Abstracts of talks at meetings
- They may be authored by the inventor or others

Not regarded as publications are:

- Any private communication
- Report to sponsor
- Talk before private group

Publishing without further action means that:

- Invention becomes part of public domain
- There is no inhibition to development if costs are low
- Absence of a preferred market position may deter firm from risking capital when development costs are high

Applying for patent, then publishing, means that:

- An incentive to develop, usually required by academic inventions, can be provided to industrial firms
- The incentive to develop is a preferred marketing position assured through a time-limited exclusive license

(Slide 8)

BENEFITS OF PATENTING

- Provides incentives to industry to develop
- Gives public new products, processes not otherwise available
- May provide financial return
- Retention of control by patentee can prevent abuses
- Disseminates knowledge
- Stimulates further research by others

Misconception: "If you publish you can't patent; if you want to patent you can't publish" - not true if proper time sequence is followed

Publication before filing a patent application causes immediate forfeiture of foreign rights

- Six months after publication you lose the right to patent in West Germany and Japan
- One year after publication you lose the right to a patent in the United States

If you file first in the United States, you preserve the foreign patent rights for one year regardless of a later publication.

To summarize, we have considered the recognition and disclosure of inventions, patenting and publishing, and the options open to the academic inventor

Evaluating the Invention

(Slide 9)

EVALUATION OF INVENTIONS INCLUDES --

- Equity: who owns it?
- Patentability: does it satisfy criteria?
- Commercial potential: is the market significant?
- can the invention be licensed?

Equity

- Depends upon source of funds (salary, equipment, supplies)
- Patent policy of the university

Misconception: "Inventions made under government grants are not worthwhile patenting"

(Slide 10)

RIGHTS-GRANTING AGENCIES
(HEW, DOD, NSF, NASA, ERDA) PROVIDE THAT --

- University may retain title
- University and inventor may receive royalty income
- Government receives royalty-free, nonexclusive license
  (Exception: Certain ERDA Atomic Energy inventions)

Some agencies, HEW, NSF, make institutional patent agreements (IPA). This University does/does not have IPA with HEW/NSF.

(Slide 11)

RIGHTS-RETAINING AGENCIES
(ERDA, USDA, USDI, EPA, AEC) PROVIDE THAT --

- Government takes title (even if partially funded)
- No royalty income for university or inventor
- University may receive "right to use"
  (Exception:USDA Hatch and McIntire-Stennis Funds)

EVALUATION OF INVENTIONS INCLUDES --

(Slide 12)

- Equity: who owns it?
- Patentability: does it satisfy criteria?
- Commercial potential: is the market significant? can the invention be licensed?

Patentability depends on whether invention meets statutory requirements

- Does it satisfy criteria?
- Is it novel, useful, nonobvious?

Commercial potential depends on:

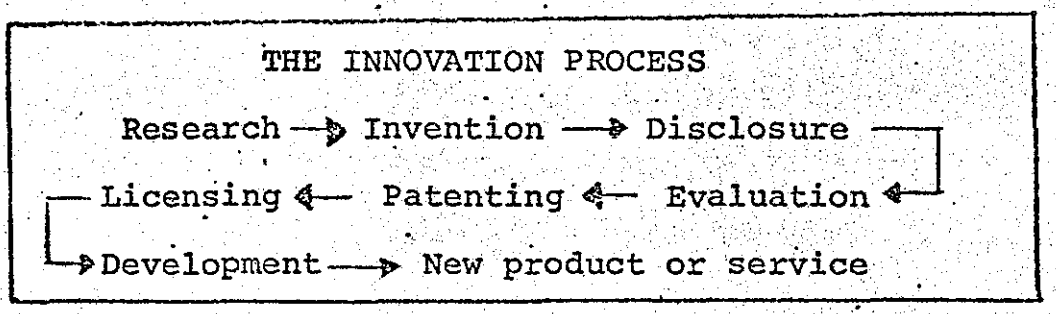
- Whether patent rights can be licensed
- Market size expectation
- How market size affects decision

Acceptance decision by patent committee means:

- Assignment of invention to university or its designee
- Further responsibility for patenting and licensing belongs to university or its designee

Bringing It All Together

(Slide 13)



The innovation process consists of:

- Series of connected steps
- Any break in chain interrupts process

Faculty researcher is involved in research, invention and disclosure

Recognizing an invention is the crucial step

- Is there an easily identifiable signal (manuscript)?

Review any publication less than one year old

- Does it describe an invention?
- Should it be disclosed to university patent committee?

Support will be provided in a continuing effort to identify inventive concepts

- Team members conducting this experiment will be available by mail or phone and on campus on a regularly scheduled basis.

IMPORTANT - PLEASE TAKE A MOMENT AND FILL OUT THE ATTACHED QUESTIONNAIRE

INVENTION SEMINAR QUESTIONNAIRE

Please answer the brief questions below (use reverse side if needed). Questionnaires will be collected at the close of the seminar program.

Name_____ Title_____

Department_____ Office location_____

University telephone number_____

What are your current major research interests?

What seminar topics do you wish to discuss in detail with us during our visits?

What current research and/or possible inventions would you like to discuss with us during our visits?

Please give us the names of any of your colleagues who you believe might be interested in this program.

What comments and suggestions do you have for conducting or improving these seminars and the program of which they form a part?

Thank you for your assistance.