PAPERS PRESENTED AT

CONFERENCE ON UNIVERSITY RESEARCH MANAGEMENT

JUNE 6 and 7, 1977



NEW YORK UNIVERSITY

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Joseph J. Keeley
Associate Director, Division of Research Development and Administration
The University of Michigan
"Copyrights-Recognition, Rewards and Problems"

Lawrence Gilbert, Esq.
Patent Administrator
Boston University
Community Technology Foundation
"How to Surface University Developed Inventions"

Norman J. Latker
Patent Counsel
DHEW
"Current Trends in Government Patent Policy"

4:30-7:00p.m. Reception (Bobst Library)
John Ben Snow Room
Coffee
Greetings by:
Dr. John C. Sawhill, President
New York University

Address:
Dr. Eric H. Willis
Assistant Administrator for Institutional Relations
ERDA

Refreshments

Tuesday, June 7, 1977 Meyer Hall, Room 121

8:30-9:00a.m. Late Check-in

9:00-11:00a.m.

Panel III on: "Management Tools"

Chaired by: Dr. John K. Wolfe, Manager
University Relations
General Electric Company

Dr. Charles C. Congdon
Assistant Director, Memorial Research Center
The University of Tennessee
"Management and the Achievement of Research Goals"

Dr. Winford E. Holland
Associate Professor, Organizational Behavior
University of Houston
"The Application of Management Tools in the University Research Environment"

Dr. Burton V. Dean
Professor, Department of Operations Research
Case Western Reserve University
"On University Research Information Systems"

Dr. H. Dudley Dewhirst
Associate Professor, Industrial Management
The University of Tennessee
"Management-by-Objectives for Research-A Contingency Approach"

11:00a.m.-12 Noon Summary Discussion

As the war ended many of the scientific personnel who had tasted applying knowledge to the solution of problems saw that the techniques that had been developed during the war would be valuable to industry. Thus, it is not surprising that in the years immediately following World War II six not-for-profit institutes were formed to apply the newly developed technology to industry. Other university research personnel thankfully returned to the university to the pursuit of knowledge through research.

These research institutes grew steadily as both industry and government agencies found them of value in applying research knowledge to problem areas. Indeed, the remarkable contribution of the research and development community to the success of the war effort brought about an awareness of the value of research and development to government and industry which has never diminished.

No additional not-for-profit research institutes were formed between 1947 and 1959 when a new concept in the purpose of such research laboratories was conceived in North Carolina. The previous institutes had been established in the more industrialized areas of the country. The concept advanced by the Research Triangle Committee in North Carolina was that a not-for-profit research institute could aid in the industrial development of the region in which it was established. The early success of the Research Triangle Institute in establishing itself as a capable research organization encouraged five other states to rapidly follow suit in establishing this new group of what might be called regional research institutes. This later group has had varying degrees of success.

We have looked at how the non-profit research institutes now in existence have started and their reasons for being formed. By a post-facto reasoning process we can observe that since they have been successful for the most part, there must have been a need for them. But the question of what function they fulfill still is not answered in detail. What is unique about not-for-profit institutes that appears to require their presence on the research scene? The answer lies principally in the fact that they provide a pool of research talent which can be used when and where needed. The institutes perform contract research for government agencies and industrial clients on problems that these clients want solved. This is quite distinct from the primary research efforts of university personnel. University research is supported by grants from both government and industry for work in the fields in which the researcher is interested. For the most part the university researcher works pretty much alone in his field of interest interchanging knowledge with his colleagues in other universities through the medium of publication. Universities are organized for educational purposes into groups of people of like disciplines. Thus, universities have Departments of Physics, Chemistry, Civil Engineering, English, Social Sciences, Biology, etc. Because of this type of organization there is less opportunity for interdisciplinary research activity. This allows each individual to pursue research in the field of his personal interest. This is an admirable way to advance knowledge which is the chief aim of university research.

There is a definite role that the contract research organization can and should play in this research triumvirate. Contract research organizations work for both industry and government with the purpose of applying knowledge toward the solution of particular problems or, at least, understanding them better. In order to apply knowledge it is necessary to have a source of that knowledge and herein lies the value of close university ties for contract research organizations. Experience shows that it is easier for university research people to communicate with institute research people than it is for university people to communicate directly with industrial researchers. Thus, the contract researcher can play a valuable middle role in the scheme of things by acquiring knowledge from the university research environment, applying it to the solution of problems, which industry can then develop into consumer oriented items.

Contract research personnel are closer to the practical side than are university research personnel, in that they must recognize the limitations imposed by cost vs benefit. Contract research personnel respect (and sometimes envy) the freedom of inquiry of the university research man while at the same time respecting the need for a well-planned and well-executed line of march toward an objective. Thus, the contract research man can understand and appreciate the environment within which both the university researcher and the industrial laboratory man must work. With this understanding he can be an effective link to the universities for industry.

Historically, the initiative for making this link with industry has been that of the contract research organization. As the contract research man sets about applying knowledge he may see a way in which that application could be valuable to industry. Given the time and incentive by his management, he can develop this idea to the point where industry can be interested in supporting the research and development necessary to bring the idea to fruition.

The initiative to work closely with the universities also must come from the contract research organization. Typically, university researchers work pretty much as individuals whereas in a contract research organization it is typical to work in cooperation with others who make up the team undertaking the study of a particular problem. Thus, university research people are by nature less apt to seek communication channels with the contract research organization. Furthermore, it is the contract research organization which needs the new knowledge which comes from the universities in its own contract work.

The Research Triangle Institute believes it is somewhat unique in the extent to which it attempts to develop and maintain close university ties. We do have one valuable geographical advantage in that we are located centrally among three different universities: a private university in Durham, Duke University; the State supported University of North Carolina at Chapel Hill; and North Carolina State University, a land grant college in Raleigh. Our university

research programs which may lead to invention. It furthermore closes the gap with industry because the licensing activity necessarily involves bringing commercial organizations into the picture. Thus, through this single example can be illustrated a valuable way in which a non-profit organization can tie the university environment to the industrial environment.

Ralph L. Ely, Jr.

May 17, 1977

Located on a 16 acre tract, the Science Center is situated between two large universities and is in close proximity to several major teaching hospitals. Nearly 60 organizations have taken up residence, among those are large international corporations, well established research companies, several government agencies and a variety of non-profit research service and support groups. More than 25 companies engaged in technological activities have started here as resident organizations. Cooperation extends to shared facilities and services which include those of the nearby member institutions. Thus, the Science Center is able to provide, cooperativly, more sophisticated services then any individual organization can justify on its own.

The potential for cooperative effort was built-in to the Science Center when it was created. Through its member institutions and resident organizations, an enormous pool of knowledge and talent for problem solving, can be tapped. Although the Science Center currently has a full time staff of 125, it is this outreach that provides the primary base for most of its problem solving capabilities. Inter-disciplinary inter-organizational teams can be quickly organized to address problems in the physical, social, health and management sciences.

A few examples of projects that have been undertaken by Science Center organized teams will serve to illustrate the enormous potential of such cooperation.

- A comprehensive evaluation of all communication activities within the research and development arm of a large food manufacturing organization was performed. The survey defined:
  (a) existing patterns of communication within the laboratory
  (b) patterns of communication between R&D and other groups

The organization and management of university/industry inter-disciplinary teams presents some unique problems. Many academics must be educated in the constraints imposed by costs and schedule. It was necessary to create a non-profit but tax paying affiliate to avoid accusations of unfair competition in the market place with for-profit enterprises providing similar services. It is necessary to work with the institutions to develop guidelines for the use of faculty members on a consulting or sub-contract basis. The unique relationship which the Science Center has with its member institutions affords great flexibility in the type of financial and contractual committments that can be made with both the team members and the customer for the service.

Project management is determined on an individual basis depending upon the job to be performed and the performing team. For university/industry teams it is important that the coordinator understand the problems associated with both the academic and the industrial world. Experience in both these worlds is essential. The University City Science Center provides a unique environment in which exposure to both these worlds is a day to day occurrence.

MANAGEMENT STUDY OF A MERGED LARGE-SCALE FLUID DYNAMICS (AND ENERGETICS) LABORATORY

John R. Ragazzini*

Presented at

CONFERENCE ON UNIVERSITY RESEARCH MANAGEMENT

May 1977



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NEW YORK UNIVERSITY

FACULTY OF ARTS AND SCIENCE

DEPARTMENT OF APPLIED SCIENCE

8. Mr. Louis Nucci, Former President, General Applied Science Laboratories (GASL)

In addition to the above, Mssrs. Weithorn and Hutton of the law firm Upham, Meeker and Weithorn were retained as legal counsel whose report is incorporated into the material which follows.

third was selected because it seemed practical and would preserve the Ferri group capability not only in the field of fluid dynamics and high-speed flows, but also in energetics and chemical combustion.

The decision was made to sell the Harlem River property and to merge the Aerospace Laboratory and its operating staff with a similar laboratory owned and operated by the General Applied Science Laboratories (GASL) located at Westbury, Long Island, New York. Dr. Ferri had a hand in the organization of the GASL laboratory and was quite familiar with its operation.

The object of this study is to determine what difficulties, if any, will be encountered by a merger of equipment and staff into a "merged laboratory" including for the moment NYU and GASL but which would be capable of including other organizations such as PINY and, possibly an industrial organization such as the Grumman Aerospace Corporation. It is hoped that the results and observations made in this study will be applicable to other mergers of this type.

In order to gain a fuller appreciation of the physical components constituting the proposed fluid dynamics and energetics laboratory, a listing of some of the major mechanical components of the laboratory will be given:

1. High Pressure Compressors (up to 3000 psi)
2. High Pressure Air Storage Vessels (up to 3000 psi)
3. 40-foot diameter Vacuum Sphere
4. Vacuum Pumps, high capacity
5. High Pressure valves, piping and couplings
6. Instrumentation, recorders, scaners, transducers
7. Shop Equipment, full machine shop, welding shop

III. PROBLEMS

Considered first are the problems associated with the merging of NYU equipment and GASL equipment into a single functioning laboratory. It is recalled that as part of the national effort for the conquest of space, numerous research laboratories have been supported by the Federal government. Much of the NYU and GASL equipment was turned over to them under a facilities contract at no cost other than transportation and was known as Government Furnished Equipment (GFE) and title to it was vested in the government. Thus, in the merged laboratory (and shop) there were the following categories of equipment:

a) GFE at NYU under a facilities contract between NYU and the Office of Naval Research

b) GFE at GASL under a facilities contract between GASL and NYU

c) Equipment wholly owned by NYU

d) Equipment wholly owned by GASL

By having a mix of equipment such as the above to be consolidated into a merged laboratory certain restrictions as stated in the Armed Services Procurement Regulation (ASPR), 1 July 1974, Sec. C-103 apply. Included among these restrictions is the one relating to Commingling of GFE and contractor-owned equipment. This would prevent locating machinery and tools from being placed where most needed by which must be segregated physically. This limitation may be waived when, in the judgement of the property administrator, it is to the advantage of the government. In the case of a non-profit organization such as NYU these restrictions are more relaxed. As a matter of fact, it is possible to transfer the title of NYU GFE from the

2. GASL can purchase its own GFE but only after it has been declared surplus and other organizations and government laboratories do not request it after it is advertised. It is somewhat risky to arrange this type of deal.

3. NYU can obtain title to its own GFE provided other universities do not request it. Except for one machine took, as of this date, NYU has had title to all of its GFE transferred to itself.

One of the consequences of maintaining "separate" organizational employers for these included in the shared facility is that each organization is responsible for obtaining funds to maintain salaries. Thus, NYU employees depend on NYU to obtain research support which if not forthcoming, would require furloughing the employee (except, of course, Faculty members having tenure). In other words, except for unusual situations, there would be no stated cross responsibility for job maintenance.

Considering all the factors in an equipment and personnel sharing approach, it was believed to be feasible, though complicated, and an examination of the operation of this system under actual conditions proved to be fairly positive. It is recognized that no small credit for its success was due to Dr. Ferri's dominant and fair personality.

Research Institutes provide management systems many of which have close resemblance to, but not identity with the merged laboratory. These institutes are operated on a non-profit basis and they have close ties with educational and government agencies and non-profit organizations such as hospitals.

By and large, research institutes are independent and tax exempt under Reg. 1.50(c)(3)-(1)(d)(5) of the Internal Revenue Code. Their directorship is under the control of the non-profit institutions even though industry representatives are to be found in most of their Boards of Directors.

When a massive effort involving industry and universities is encountered, it is usually in the conventional way, that is, one party is a prime contractor and the other is a sub-contractor. A good example of this kind of relationship is to be found in the University of Minnesota-and Minneapolis Honeywell Corporation in which the university is a prime contractor and Honeywell as subcontractor in the field of solar energy power systems.

Aside from this example, no analogue of the NYU-GASL merged laboratory is to be found. The organizational structure must break new ground for this reason. A number of alternate plans have been developed and will be referred to as Plans A, B, C and Modified Plan C.

Plan A

This plan, diagrammed in Figure 1, has the advantage of simplicity. Each participating unit has a full complement of technicians to operate the facility. The only part of the laboratory which is merged is equipment. This type of structure makes it easier to integrate more organizations such as POLY (which has unionized technical staff) but it is economically inefficient.

MERGED SYSTEM (PLAN B)

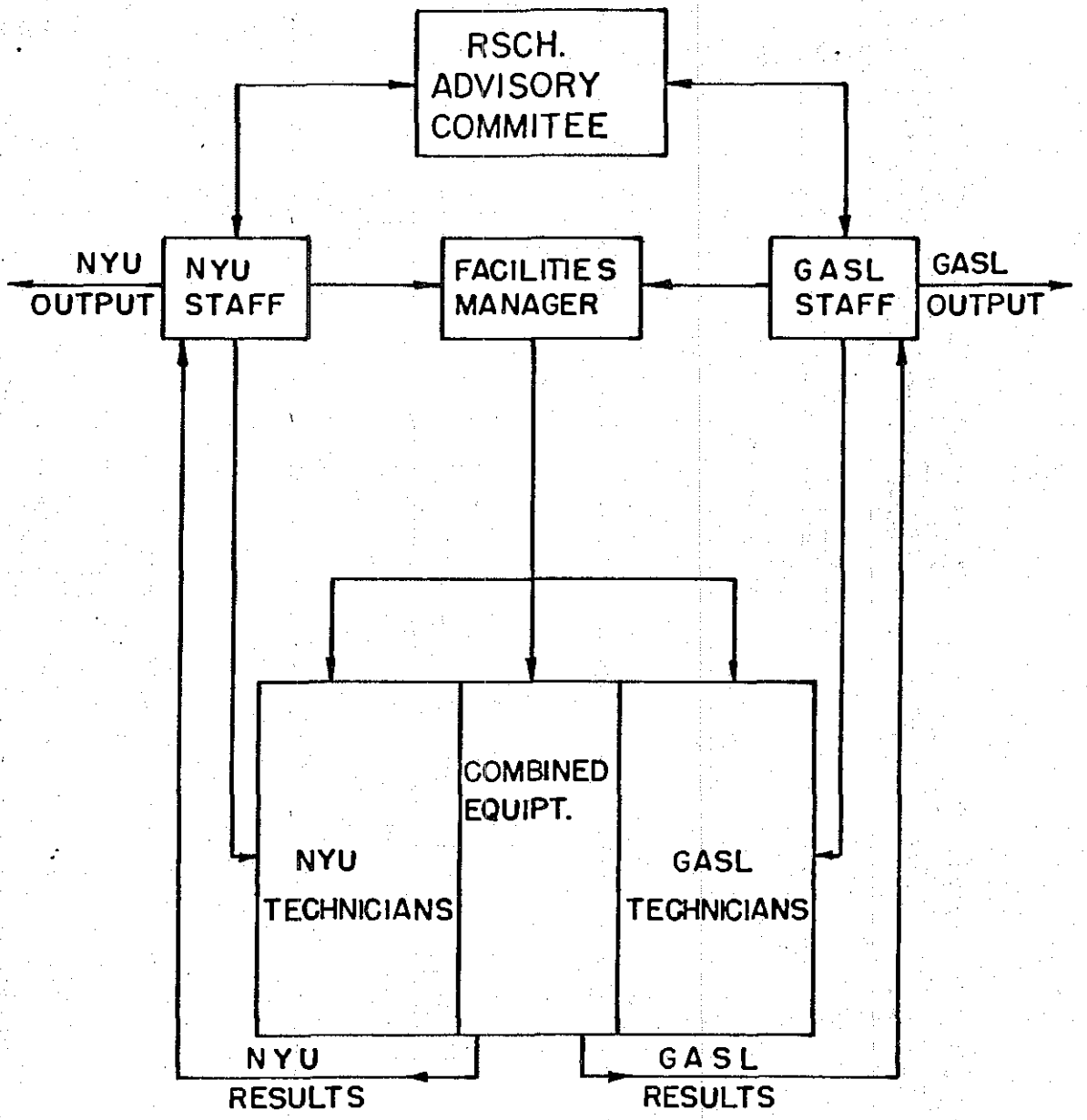


FIG 2

Plan B

This plan shown in Figure 2, calls for the merging of both equipment and technician staff. To operate, only a single complement of technicians is required, some employed by NYU and some by GASL but all working together under the supervision of a facilities manager or committee. Scientific experiments are devised by the professional staffs of the two organizations and are scheduled by the facilities manager for experimental completion. Results are fed back to the scientific staffs for consideration and further experimentation. This plan has the advantage of merging technician personnel as well as equipment. Each of the technicians is employed by his home institution (NYU, GASL or additional partners) and when employed by the "other" institution a system of cross billing is used. If equal use is made by both parties, these bills would cancel themselves out. Similar billing techniques can be employed with regard to time on machinery electricity costs, etc. While more record keeping and paper work is required, actual use of the system has proved fairly practical.

Plan C

Plan C is shown in Fig. 3. The plan calls for the establishment of a separate tax-exempt affiliate laboratory corporation wholly owned by the partners, NYU, GASL, and possibly, POLY. A question arises as to whether this can be done in view of the mixed nature of the proprietors. However, if GASL or similar business organizations were included, as is being suggested, it would be necessary for GASL to give up any equitable interest in the new corporation. This factor is particularly important in the merged laboratory situation because of the mixed nature of the equipment ownership. Wholly-owned GASL equipment can be donated, or sold, to the new corporation

the donation of GASL-owned equipment to the tax exempt laboratory corporation. In addition, members of the Board of new laboratory corporation, be they from NYU or GASL, would be under a restriction that their membership would not imply proprietary interest by their parent organization.

It is possible that a situation exists, or may develop, in which tax laws would make it desirable for GASL to make such an equipment gift to the laboratory; however, this does not seem likely at the present time.

Maurice J. Sinnot
The University of Michigan

Analysis of University-Industry Programs Sponsored by the Department of Defense

" My presentation at the RMI Conference will describe and summarize the results of a long-time program that was funded by the Department of Defense on Industry-University joint research programs. I became involved in these while Director of the Materials Science Office and later Deputy Director of the Advanced Research Projects Agency of the Department of Defense while on leave from The University of Michigan".

PATENT AWARENESS PROGRAM

ROBERT GOLDSMITH

RESEARCH CORPORATION

May 26, 1977

institutions summarizing the types of research being conducted at the university, the sponsoring agencies, the amounts of money by project, project title, principal investigator and department. A study of this material enabled us to zero in on the departments within the university that appeared to have the greatest potential for developing patentable technology as a result of the research being undertaken. Having now narrowed down our field of activity to specific departments meetings were set up with the department chairmen at which time we outlined the program that was planned. We also indicated to the department chairman that the university administration was morally supporting us in our efforts. The object was to win the support of the individual department chairman with the firm expectation that his obvious cooperation and enthusiastic backing would make the future conduct of the program more acceptable to the faculty members in each individual department.

At the outset, it seemed fairly obvious that, if the department chairman was not convinced of the value of the program, it would be difficult to obtain the cooperation of his faculty which was needed in setting up the rest of the program. This assumption was strongly affirmed during the course of the study.

The balance of the program consisted of two separate approaches to the faculty members. The first took the form of departmental seminars. For the seminars we developed an outline which generally described the purpose of the program and explained to the faculty member the benefits that could accrue to the institution, the individual faculty member and to society in

had to conduct more seminars then we had anticipated since efforts to combine departments of closely related disciplines were generally unsuccessful. We also found that there were specific times of the day and days of the week that were more advantageous than others. Here, again, the cooperation of the department chairman was extremely valuable, since if he was completely cooperative, he could frequently schedule the semiar as one of the department's regular meetings either late in the afternoon or during a lunch period. Seminars scheduled either of those two times resulted in the attraction of a fairly high percentage of faculty. Attendance at these seminars varied widely dependent on advance publicity, the amount of effort by the chairman, the time and place selected and the general attitude of the chairman as reflected at the faculty level. Attendance ranged from zero, in some rare cases, to 100% when the chairman was a dominating factor. Average attendance appeared to be about 50 to 60%. The seminar talks were designed to fit into the academic hour and were limited to between 30 and 40 minutes, allowing 10 to 20 minutes for a question and answer period. If the seminar was scheduled in the late afternoon, longer question and answer periods were possible.

These broad-brush type seminars were then followed by interviews with individual faculty members at later dates. The selection of which faculty members to interview was made by using the list of research grants obtained from the administration, discussions with the department chairman during which time we were able to determine which members, in the chairmans opinion, were conducting research that might lead to patentable invention,

this approach. There appears to be some degree of overkill in the frequency of visits to the institutions for individual interviews. Our original intent was to visit each institution two days a month during the first year after the conduct of the seminars and then two days every other month for the second year of the program. This level of frequency was found to be economically unsound and could probably be reduced at least in half. We now believe that a fewer number of visits would have developed the same number of disclosures. This would have lowered the overall cost per disclosure. The seminars appeared to be of greater value at some universities than at others. If the university already had an active program of meeting with faculty members and encouraging them to make disclosures and in addition had a mechanism for evaluating patenting and licensing these disclosures then the seminar approach was on too basic a level. However in these institutions that were only beginning to get involved or were only modestly involved, then the seminars were extremely valuable.

The level of success achieved varied greatly depending upon the patent policy of the institution and how rigorously that policy was administered. Where the university's policy was well defined and aggressively pursued beneficial results were more marked than at those institutions having little or no interest in patent matters. Where a new policy had just been put into effect and was being handled in a relatively passive manner increases in the disclosure rates were again significant. In any event we are quite confident that, when all of the data is in, with one exception, the average number of disclosures received annually over the five-year period will have doubled

UPI AND THE UNIVERSITY INVENTOR

A.S.Alpert, Esq.

University Patents, Inc. is a service company engaged in the evaluation, processing and licensing of patentable technologies. It functions as the service agency for University inventors arranging, on their behalf, for commercial companies to undertake additional research and development leading to the manufacturing, and marketing of new products. UPI's services include the identification of new technology as a result of interviews by its patent staff with inventors. The services also include the evaluation of economic, as well as technical merits of the new inventions, the filing and prosecution of patents covering such inventions, and the licensing and administering of these patents. The costs of these services are borne by UPI. Only when revenue is produced through licensing is UPI reimbursed by a share of royalty income.

UPI's management is convinced that a successful University patent program depends initially upon on-site contacts with University inventors. UPI normally provides, for its client Universities, an on-site consultant--usually a patent professional--who is available to advise and consult with faculty and staff members. UPI staff members also travel to campus locations, on a regular basis, to provide frequent liaison and to encourage an interaction between patent professional and inventor during technical appraisal and marketability procecures.

But, even good inventions do not sell themselves. Major technological breakthroughs represent significant risks to

Joseph J. Keeley

COPYRIGHTS

RECOGNITION, REWARDS, AND PROBLEMS

I would like to make a few preliminary remarks on copyright law, its history, and the revised copyright law, which will be placed in effect January 1, 1978. Most of my talk will be devoted to those copyright problems that might be of interest to the University community; this will be based on two decades of experience with the University, plus a short tenure of service in the Library of Congress.

Article I, Section 8, of the Constitution provides the basis for our copyright law. It reads as follows: "Congress shall have the power . . . to promote the progress of science and useful arts, by securing for a limited time to authors and inventors the exclusive right to their respective writings and discoveries." Title 17 of the U. S. Code provides statutory guidance. There have been many amendments and changes to our copyright laws during the past seventy years. The changing times, new medias of communication have necessitated the updating of the laws to keep pace with the new developments. The new law is an outstanding piece of legislation. It is the result of many years of consultation with representatives of the media, publishing houses, federal agencies, and a host of authors. It is gratifying to all that it is a complete revision and not another piecemeal effort. It will soon be tested in the courts; we suspect that the law will survive without major surgery.

Until the last decade, many of our educational institutions paid little attention to the matter of copyrights. All seemed to observe the time honored, precept that the faculty member was free to write his textbooks, arrange for their publications, and hopefully, enjoy modest royalties for a period of five years. The publication would be duly reported in his personnel file and become a matter of discussion during his next promotional review. While we were slow to realize it, there has been a very dramatic change in our attitude towards copyrights. This is based on two very

initiated at the Vice President level, preferably the Vice-President for Academic Affairs, or the Vice-President for Research. A committee should be formed with wide participation, regular meetings, and reporting of the studies and the action taken; recommendations are sent to the Faculty Senate for their approval, and then submitted to the Board of Regents for final action. During these proceedings, there is a regular reporting of the status of the action in the campus media. This is to afford the academic community an opportunity to provide an input. Once the approval of the Bylaw, there is a complete publication. In addition, the final release will include the name of the Officer responsible for providing copyright guidance; preparation of forms; record-keeping; royalty distributions; etc. At all times the language used should be such that it reflects the cooperative efforts of all concerned. The following is our June, 1976, revision of Bylaw 3.10:

"Sec. 3.10. Ownership of Patents, Copyrights, Computer Software, and Other Property Rights. Unless otherwise provided by action of the Board:

A. Patents and copyrights issued or acquired as the result of or in connection with administration, research, or other educational activities conducted by members of the University staff and supported directly or indirectly (e.g., through the use of University resources or facilities) by funds administered by the University, regardless of the source of such funds, and all royalties or other revenues derived therefrom shall be the property of the University.

B. Computer software created by members of the University staff in connection with administration, research, or other educational activities supported directly or indirectly by funds administered by the University, regardless of the source of such funds, shall be the property of the University. Such computer software may be made available for use on a nonexclusive basis by those who pay appropriate charges to reimburse the

has been especially prepared for those holding R.N.'s who want to earn a Baccalaureate in Nursing. Several of the latter have been published and have been field tested throughout the State of Michigan. While the results are not all in, there has been overwhelming endorsement of this program. In the latter case, the sponsor of the effort has permitted us to copyright the material and left the decision as to further publication with us. From our initial survey for the State of Michigan, we ascertained that there would be approximately 30,000 R.N.'s who might be candidates for this program. However, if there were even a 35-40% response, it would be truly overwhelming. As a corollary to the production of the notebooks, we have also noticed that the faculty members are proceeding with revisions of their textbooks in order to complement or to fulfill the mission of the workbook program.

As a change of pace, and before proceeding further, a special comment should be made on the outstanding service provided by the Copyright Office. The simplicity of the forms, such as Form A for books; Form J for photographs, and Form A-B for registration of work published abroad, etc., make for expeditious action by all concerned. Further, there is an available flyer for every classification; on rare occasions, I have used the telephone and my request was promptly answered. Since the Copyright Office is in close proximity to the Patent Office, I have availed myself of the opportunity of visiting it at least once a year.

During the past eighteen months, we had two very interesting and yet time-consuming problems concerning copyrights. The first was a series of publications, books and tapes, under the title, "Action English." This effort was for a Japanese sponsor. All the work would be done on our campus, but the publication would be done in Japan. We completed Form A-B to register these efforts. The sponsor asked for and received an exclusive license to publish and distribute the work in Japan and three other Asian nations. We readily agreed to this during the negotiation stage; however, none of us could anticipate the subsequent interest in "Action English"

Copyright Office, and did ascertain that the copyright symbol could be placed on the cover. This manual is under the Library of Congress Z-642 section, and is a veritable Guiness book of information for copyrights.

Some mention must be made of the Doctrine of Fair Use. We have over two hundred copiers throughout the University. I can not help but feel that this Doctrine is tested every day. Since the copiers in the library areas are coin-operated, we feel that there will be no abuse of the Fair Use Doctrine. The new law will relieve much of the anxiety as to our operations. It provides for the reproduction for such purposes as criticism, comment, news reporting, teaching, scholarship, research, as well as multiple copies for classroom purposes, are not to be considered as an infringement of the copyright. When copying for other purposes, that is, making use of this doctrine, the following should be considered: (1) the purpose and character of the use, that is, commercial or nonprofit; (2) the nature of the copyrighted work; (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and (4) the effect of the use upon the potential market for value of the copyrighted work. This should certainly ease the conscience of the instructor who makes forty or fifty copies for classroom assignments. On some of our copiers, but not all, there is a copyright notice. When one anticipates going beyond the Doctrine of Fair Use, then permission should be sought from the owner of the copyright. To expedite this request, the following is recommended: list the title of the work and the author; the pagination and/or chapters; number of copies to be made; and the use contemplated, and whether or not the material is to be sold. Response time is usually slow.

We have had a recent case where a doctoral candidate needed to use a county map as part of his dissertation. The map had been prepared by the nation's largest

HOW TO SURFACE
UNIVERSITY-DEVELOPED INVENTIONS

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Universities that have a patent policy speak first and foremost of their responsibility to protect the public good. And so it should be. The university can accomplish this by conducting basic research and by promoting the utilization of the fruits thereof by means of the patent system. I am not here to argue the merits of the patent system but those that doubt that the patent system is an effective means of promoting utilization may find enlightening the following remarks from "The Role of Patents in Pharmaceutical Inventions" by Connor and Wolk.

"The U.S. drug industry leads the world in development of new medicines. During the twenty year period from 1941 to 1961, 544 major new drugs were made available. Nearly two-thirds of these originated in the United States, 316 came from the laboratories of the pharmaceutical industry, and only 25 came from educational and other nonprofit institutions and the government.

with a disclosed invention rather than in ferreting out the undisclosed. Notwithstanding, interest has not been lacking; witness the number of universities that attend the Dr. Dvorkovitz annual university-industry forum and the growth of the Society of University Patent Administrators (SUPA), a fledgling organization, some 2 1/2 years old, that has about 100 representatives from the university sector. However, except for those with in-house programs, none have a full-time patent administrator serving as a focal point for the university.

As a rule of thumb, there should be at least one invention disclosure for every one million dollars of university research. Clearly, a lot of disclosures are neither surfaced nor, if surfaced, acted upon. In view of the fact that the patent resource represents a source of unrestricted funds, which can be more fully appreciated when it is realized that it requires approximately two million in unrestricted endowment funds to match 100 thousand dollars in royalty income, why don't we see a more concerted effort to develop and implement a patent

In many cases, patent rights vest in the grantor, the U.S. government. Although most agencies have a waiver procedure which allows the university to acquire rights to an identified invention, there are several undesirable features. First, the waiver procedure is an administrative burden which is time-consuming and exceedingly slow. The inability to act quickly often results in the loss of foreign rights and possibly even U.S. rights. True, the university can obtain permission to file a U.S. case so as to preserve rights but, in the event the waiver of U.S. rights is denied, costs are normally not reimbursable. Recent interest on the part of the government in foreign rights no longer results in their automatic release. For example, the NTIS of the Department of Commerce has funds to file foreign applications and presently does so for agencies such as USDA and DHEW. Finally, if invention disclosures may not be filed on forthwith, prospective licensees must be contacted, if at all, under the cloak of secrecy.

Fortunately, the issue of patent rights may become a non-issue through the efforts of Norman Latker, Patent Counsel for

can move forward with the researcher confident that his rights are protected under a uniform policy."

Patent administration, when it exists within the university, most often reports to the Office of Grant and Contract Administration. This is unfortunate because this office has little incentive to provide support. It can get no reward. In the best case, patent compliance required by the granting agencies, causes the office to identify someone in the group as the patent administrator; in the worst case, compliance is simply ignored. The lack of support is evidenced by the fact that the majority of SUPA members devote between 5% and 10% of their time to patent matters, yet they are the patent administrators for their respective universities. The net result is that patent administration is often a step-child, tied to grants and contracts.

The lack of a patent administrator as a focal point who can devote full time to patent administration, creates great difficulties for the individual in the private sector who has the responsibility for establishing a liaison with the

(often no such committee exists). University patent policy might allow the p.i. to disclose his invention directly to a patent management organization. However, it is more likely that the principal investigator, who is already overburdened with reporting, will publish his findings in a Journal and be done with it. That helps in obtaining grant awards; the role of patents is far less understood.

The lack of incentives in the form of significant equity sharing of royalties with both the inventor and/or his department is but another factor in the invention disclosure equation. Recent trends[1] in university patent policy exhibit a significant increase over the traditional 15% of gross royalties of equity to the inventor. More to the point, one can find a high correlation between active and successful patent programs and a policy that provides greater equity to the inventor. A singular exception is the WARF which, in my opinion, is the best and most effective example of a patent program serving a

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1 "Survey of Patent Policies As They Relate to Royalty Income Paid the Inventor", prepared by Michael J. Pelczar, Jr., C. Wilbur Cissel, and Milton Goldberg, 8-15-73

by a patent management organization that hopes to recover its investment as an expense prior to distribution of royalties.

The soft-money syndrome causes non-salaried researchers to spend a significant portion of their efforts in the generation of grant proposals. Typically, such a researcher is too busy surviving to be concerned with invention disclosures. The vicious cycle of grant proposal, grant award and publish makes one wonder when he/she has time to do research.

There is no lack of good concepts at the university. Often, they are the unfunded byproducts of research. What is typically lacking are mechanisms for developing these concepts to the feasibility demonstration stage at which point outside interest could be ascertained. Although most universities have small slush funds available for viable proposals, they are difficult to come by, especially for the young professor without a track record.

Finally, the patent management organization, often unjustly maligned, has only a few techniques available to it to surface inventions at the university. Two of these organizations have

patent activities.

IPA or not, the university should create the position of patent administrator, and make the position full-time reporting to someone at least at the vice-presidential level. The patent administrator must have support from the top, the Trustees and the President, to acquire the visibility and cooperation with faculty and staff necessary to surface inventions and to provide for the long-term commitment that a patent program requires. The importance of the timely surfacing of inventions cannot be overemphasized. For example, it can mean the difference between the acquisition of foreign rights or U.S. rights only. In view of the fact that the U.S. market represents only about one-third of the world market for high technology products, loss of foreign rights could have a considerable negative effect on potential total royalties.

A full-time patent administrator, as the focal point for handling all university technology, provides several beneficial services to the principal investigator (p.i.) He relieves the principal investigator from time-consuming burdens associated

directly by the university involves use of the United States defensive publication program which can be coupled with an election to make the application international under the Patent Cooperation Treaty. The Treaty is expected to be ratified by the requisite number of nations within the next year. Such an election could cut U.S. filing costs up to 50% and enable the university to postpone filing decisions; thirty months from the initial filing date with respect to the U.S. application, twenty months from the initial filing date with respect to foreign filings.

There are many instances where a researcher has a concept with good commercial promise but lacks the small amount of funds necessary to demonstrate feasibility. Generally, it is too early to generate interest from the private sector. The researcher may not wish to disclose his invention to a governmental agency for fear of loss of rights under the Freedom of Information Act. Also, in many cases, the proposal would not be suitable for grant support by the government because it is the byproduct of research programs previously funded by the government and it

developed inventions, and increase the probability of generating royalty income since such proposals would have direct commercial application.

In conclusion, university-developed inventions can be surfaced and brought to the marketplace if the university is willing to make the necessary commitments. A commitment by the President of the university to make a patent program visible is a prerequisite to success.

The National Science Foundation-Research Management Improvement Program was an unusual opportunity for scientists in the United States, who undertake Federally sponsored research, to apply their spirit of inquiry to their own organizations. It was a chance to work on the vehicle of science in contrast to the universal interest in the content of science.

This project on Management And The Achievement of Research Goals was a test of a model developed at The University of Michigan-Center for Research on Utilization of Scientific Knowledge (CRUSK) for strengthening and renewal of research and development labs. The CRUSK Model was itself the outcome of a long-standing interest in applying behavorial science discoveries to research organizations.

The CRUSK Model, which was also under test in the US Forest Research Service, is an organization development model that applies a problem solving sequence to topic areas of major concern to a research institute, i.e. the planning focus, the organization focus, the scientist or individual focus, and the focus on outputs or uses to which the research is put. With an inside/outside team approach a test of CRUSK Model was made at a biomedical research institute in a university medical center. The University of Tennessee Memorial Research Center is a small research organization with about 25 scientists and a total of a hundred persons.

We found in testing the model that the planning and organization focuses were easiest to work with. It was difficult to involve the individual scientists in a study of his/her own personal role in setting and achieving organizational goals. In addition the output and use focus of the model is so tied in with traditional views of individual basic and applied scientists about this topic focus that not much emphasis was placed on it. Evidently the 2-3 year period of this study of the CRUSK Model would need to be extended to find meaningful ways to make a significant test of the individual and output focuses. One suggestion that has repeatedly surfaced during the two tests of the Model is to add an economic focus. This might be a valuable point of entry into the more difficult areas of research organization functioning, at least for those that are part of a university medical center. Systematic formal problem-solving approaches are reluctantly used in research organizations in coping with economic issues whether they are at the organizational level or that of the individual scientist.

As result of the project, researchers saw productive changes at the organizational level in committee work, researcher-administration relations, and informal communication. They also reported greater individual problem-solving skills but no change in the reward system. Support staff saw many more areas of positive change in organizational functioning than did researchers but they too were disatisfied with the reward system.

DRAFT
May 15, 1977

NEW YORK UNIVERSITY CONFERENCE ON UNIVERSITY RESEARCH MANAGEMENT

"On Test and Evaluation of the University Research Profile Information System (RPIS)"[1]

Burton V. Dean[2,3]
Department of Operations Research
Case Western Reserve University
Cleveland, Ohio 44106

Abstract

Previous studies have indicated the need for a research information system at Case Western Reserve University,[4] identified as the Research Profile Information System (RPIS). RPIS is based on faculty information requirements. RPIS is being tested and evaluated at the present time. This paper reports on the results obtained during the study period 1976-77.

Background

A proposal to develop a computerized faculty Research Profile Information System (RPIS) at Case Western Reserve was prepared in its initial form in January, 1976 as reported in Technical Memorandum No. 411, "A Proposal to Develop a Research Profile Information System at Case Western Reserve University", Office of Research Administration, University

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[1] Paper presented at the University Research Management Conference, New York University, June 6-7, 1977.

[2] Principal investigator, NSF/RMI Project, Case Western Reserve University.

[3] Acknowledgments are due to Dr. Allen Moore, Director, Office of Research Administration and Mr. Michael Goodman, Graduate Assistant, Operations Research, Case Western Reserve University, for their contributions to this paper.

[4] See Paper entitled, "University Research Information Systems", ORSA/TIMS National Meeting, Miami, Florida, November 3-5, 1976 (in Appendix I).

Case Institute of Technology (CASE) and the School of Medicine (MEDICINE) in order to familiarize them with the purposes and goals of RPIS. Both CASE and MEDICINE agreed to support an effort by the Office of Research Administration to implement the system in 1977.

System Description

RPIS is constructed based on faculty responses to questionnaires requesting information on academic background, publications, research projects, and research interests in general. A complete description of RPIS is provided in the Technical Memoranda in references cited in Appendix I. A memorandum and questionnaire are presented in Appendix II. When the system is operational, it will be possible to conduct faculty searches and matchings based on research needs and interests. Also it will be possible for administrators and faculty as well as graduate students to easily identify faculty who might be interested in performing research in specified areas.

CASE

The Director of the Office of Research Administration interviewed all Department Chairmen at CWRU beginning in January, 1977. The purpose of these interviews was to explain RPIS, to solicit their willingness to participate in a test of the system, and to obtain confirmation on lists of key words to be used to identify faculty research interests.

Following these interviews, the following information was distributed to CWRU faculty:

1. A covering letter indicating the purpose of the system and soliciting the cooperation of the faculty,

as supplied by the NIH CRISP for individuals who hold NIH Study Grants. CRISP (Computer Retrieval of Information on Scientific Projects), is a comprehensive system developed and maintained to facilitate the rapid dissemination of up-to-date in-depth scientific information on research projects supported through the various research grants and contracts programs of the Public Health Service or conducted intramurally by NIH and NIMH.

Test Evaluation

The results of the initial test are expected to be completed by July 1, 1977. The primary purpose of this test is to determine whether there is sufficient interest on the part of the faculty for the adoption of such a system at Case Western Reserve University.

As indicators of the usefulness of the system, several measures are to be utilized as follows:

1. The percentage of returns from CASE and MEDICINE faculty.
2. The degree of the response, in terms of numbers of key words submitted.
3. The degree to which the returns are completed in terms of accuracy and extent, with particular reference to key words.
4. The statements by the faculty as to the usefulness of the questionnaires and of the keyword information contained in them.
5. The number of the faculty covered in each department.

The Medical School questionnaires were reviewed at meetings with the Medical School Executive Committee.

Following an evaluation of both CASE and MEDICINE, long range plans will be developed. If the response is successful in the case of CASE and MEDICINE, there are plans for the extension of RPIS into Humanities, Social Sciences, Library Science, Management and the other graduate and

APPENDIX I

On University Research Administration Information Systems

Burton V. Dean

Department of Operations Research
Case Western Reserve University

I. Introduction

The major objectives of the project were (1) to design and implement an improved system for use in research administration at Case Western Reserve University (CWRU), and (2) to organize and to disseminate to other universities these concepts, and solutions found useful to CWRU. The project was performed in three phases: (1) a detailed description of the total research administration system in CWRU, (2) detailed problem analyses, and (3) implementation and evaluation of results of the study.

II. Phase I

In the first phase, the research administration system at CWRU was fully described.[1] Included in this study are descriptions of how decisions are made during the administrative process, of flows of information, of the offices involved and corresponding tasks performed, and suggestions for areas of improvements in this complex stystem. The study was divided into four major parts. The first part deals with an indepth description of all the major elements of the CWRU research administration process. The second part deals with a detailed description of the methods and procedures used by major university offices, which are involved with the research administration process. The third part deals with a summary of the data gathered from an information systems questionnaire. The final part deals with potential areas for further study and research in the area of research administration.

III. Phase II

In the second phase of the study, the following detailed problems were analyzed based on the results obtained in the first phase:

A. A study was conducted of the feasibility of a faculty research profile information system to be utilized to match faculty research interests

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[1] "A Systems Description of the CWRU Research Administration System", Technical Memorandum No. 348, Department of Operations Research, Case Western Reserve University, December 1974.

1. The activities of ORA, its organizational location and its costs of operation are within the norms existing in the comparison study.

2. This office (ORA), unlike others in the comparison study, does not attempt to deal with the specialized area of foundation support. Another office, affiliated with the Development function is staffed to handle all foundation requests, including those involving specific faculty research projects.

3. Respondents in general and faculty members in particular view the generation of new projects as a highly important function. To the extent that faculty expected ORA to take responsibility for this function, they felt it was performed poorly. (How realistic this expectation is must be determined by an examination of the actual role of such an office.) (see Section IV.B below.)

4. The administration of active projects, while rated less important, was judged to be performed relatively well. Departmental aides particularly felt that the office provides competent and immediate help.

5. Those faculty members who did not report having their own contacts in agencies and in other universities to aid in generating projects gave the office lower ratings on performing this function than faculty who report contacts of their own in agencies and other universities.

IV. Phase III

In the third and current phase, the following studies have been performed or are underway. The primary emphasis in this implementation stage is due to an outcome of the studies in the previous stages.

A. The recommendations of these studies are as follows: That ORA develop stronger faculty and departmental services in the area of research project generation, including:

1. The strengthening of information gathering on federal government agency research interests.

2. The conduct of briefings within the University on research funding trends.

3. The development of a system for recalling faculty interests in response to funding opportunities.

B. A survey of 100 major universities as to the role of research administrators in the acquisition of new project support was conducted by the

CASE WESTERN RESERVE UNIVERSITY · CLEVELAND, OHIO 44106

APPENDIX II

March 30, 1977

MEMORANDUM

TO:

FROM: Allen C. Moore

RE: Initiation of a Research Profile Information System (RPIS)

Won't you join us in an experiment?

Attached is a summary providing the basic facts about RPIS. The ORA sees in this system a means for improving its services through better communication with members of the faculty.

RPIS is being implemented on a trial basis. If it works out and faculty members find it useful, it will be continued. If it proves to be otherwise, it will be dropped. RPIS will have a fair trial, however, to the extent that a major percentage of the faculty respond and complete the questionnaire.

With respect to the five-page questionnaire you will note that most categories can be taken from a recent curriculum vitae by a secretary. You will need to spend a minimum of time on the remaining sections.

The key word list, which is also included, is intended to serve as a starting point. As you will note, you are asked for additional key words in the questionnaire.

Please return the completed questionnaire to ORA by April 15, if at all possible. Should you have any questions or need help, call us.

Your cooperation in this venture will help contribute to its ultimate success.

ACM:bk
Attachments

Who will operate RPIS?

The Office of Research Administration will:

(1) Receive completed questionnaires and arrange for computer inputs.

(2) Take responsibility for additions, revisions, and general updating of profile information.

(3) Interrogate the system regularly to obtain names of faculty members whose interests match up with specific research funding opportunities.

(4) Notify faculty immediately of the existence of these opportunities.

(5) Utilize the system to obtain profile information for other purposes previously listed.

(6) Assist faculty, students, and administrative staff in utilizing the system.

When will RPIS be in operation?

The target date for utilization is June 1, 1977 (depending upon response of the faculty).

8. Publications--Articles, Chapters, Books, Etc. (List the three publications or works in progress which indicate your on-going scholarship or research interest.)

(a) _____
Title, including subtitle

_____

with _____
Coauthor(s)

_____
Book or Journal Title (where applicable)

_____: _____, _____, _____
Volume Number Date Pages

Status: [ ] Published [ ] Work in progress [ ] In press
[ ] Accepted for publication
[ ] Submitted for publication

(b) _____
Title, including subtitle

_____

with _____
Coauthor(s)

_____
Book or Journal Title (where applicable)

_____: _____, _____, _____
Volume Number Date Pages

Status: [ ] Published [ ] Work in progress [ ] In press
[ ] Accepted for publication
[ ] Submitted for publication

(c) _____
Title, including subtitle

_____

with _____
Coauthor(s)

_____
Book or Journal Title (where applicable)

_____: _____, _____, _____
Volume Number Date Pages

Status: [ ] Published [ ] Work in progress [ ] In press
[ ] Accepted for publication
[ ] Submitted for publication

10. Please provide a statement summarizing the primary objectives of your current research/scholarship. The statement should be comprehensive and utilize as many significant terms (nouns) as possible that express the technical terminology or jargon unique to your discipline. This will enhance ORA capability in conducting computerized searches and increase effectiveness in targeting program and agency information and solicitations of possible interest to you. (Please underline those key words you consider to be most important in characterizing your interests.)

Additional key words (not appearing in the above summary statement)

_____, _____, _____

_____, _____, _____

_____, _____, _____

11. Research/Scholarly Specialties

A. From the attached key word list please indicate below the research and scholarly specialty codes which most closely relate to you. Please list no more than 15 codes.

_____, _____, _____

_____, _____, _____

_____, _____, _____

_____, _____, _____

_____, _____, _____

B. If the table does not include all of your specialties, enter below the code number(s) in the table that is/are closest to the missing specialty(s) and the corresponding term(s) you wish to add to the table.

Code Number	Term	Code Number	Term

9. Sponsored Projects (List one to three sponsored projects performed or in progress, which indicate your current research interests.)

Project Number 1

Project Title _____

_____

Faculty Co-Investigators _____

_____

Sponsoring Organization _____
Department _____
Address _____

_____

Funding Period _____ To _____
(month/year) (month/year)

Project Number 2

Project Title _____

_____

Faculty Co-Investigators _____

_____

Sponsoring Organization _____
Department _____
Address _____

_____

Funding Period _____ To _____
(month/year) (month/year)

Project Number 3

Project Title _____

_____

Faculty Co-Investigators _____

_____

Sponsoring Organization _____
Department _____
Address _____

Funding Period _____ To _____
(month/year) (month/year)

CASE WESTERN RESERVE UNIVERSITY
RESEARCH PROFILE INFORMATION SYSTEM (RPIS)
QUESTIONNAIRE

Please type or print information.

1. Social Security Number _____

2. Name _____
Last First Middle Initial

3. Rank:
1 [ ] Professor
2 [ ] Associate Professor
3 [ ] Assistant Professor
4 [ ] Instructor
5 [ ] Research Associate
6+ [ ] _____

And, if applicable:
20 [ ] Dean/Associate Dean
21 [ ] Department Chairman
22 [ ] Director of _____

4. Phone Extension _____

5. Department (Primary) _____

Department (Secondary) _____

Department (Secondary) _____

6. Degrees (Please indicate advanced degrees you hold.)

Doctorate(s):
1 [ ] Ph.D. 3 [ ] M.D. 5 [ ] Sc.D.
2 [ ] Litt.D. 4 [ ] Ed.D. 6 [ ] J.D.
7 [ ] Other _____

Master(s):
20 [ ] M.A. 21 [ ] M.S. 22 [ ] S.M.
23 [ ] M.F.A. 24 [ ] M.B.A.
25+ [ ] Other _____

7. Professional Identification [Please indicate how you regard yourself professionally (e.g., as a chemist, sociologist, electrical engineer, pharmacologist, etc.). Use as many descriptive terms as necessary.]

_____, _____, _____

_____, _____, _____

The CWRU Research Profile Information System (RPIS)

What is RPIS?

RPIS (Research Profile Information System) is a computerized means for storing and utilizing in-depth information on each faculty member's academic background, professional identification, current research activities and interests, specialties, publications, etc.

What can RPIS do for the faculty?

Through available key words and detailed sub-categories contained in the system, RPIS will make possible:

(1) More efficient and timely communication between ORA and the faculty with respect to the availability of specific funding opportunities through grants or contracts from governmental and private sources.

(2) The location by faculty of colleagues in unfamiliar academic areas who have the capability and desire to cooperate in various research projects, particularly larger scale interdisciplinary programs, thus enhancing the probability of obtaining this kind of support.

(3) The development of directories detailing faculty information by department, school, or special research interest groupings.

(4) More effective interaction with the industrial community leading to cooperative research, graduate student support, or consulting arrangements.

(5) The facilitation of a graduate student's selection of a thesis topic and advisor; or in the location of specific expertise or knowledge needed in planning a particular graduate program.

How does RPIS get started?

Faculty members will be asked to complete a five-page questionnaire to provide the detailed information that will go into the computer memory. Initiation of this phase will be through the individual schools and departments of the University.

RPIS is a voluntary system and will include only the information contributed by cooperating faculty members. The value of RPIS will, of course, increase in proportion to the number of faculty who elect to participate.

What is the current status of RPIS?

Computer programming has been finished. As completed questionnaires are received, profile information will be entered into the computer for later retrieval.

ORA, in response to the faculty expectation cited above.[5] The results of the survey confirmed that:

1. None of the 63 respondents were using any novel approaches in assisting their faculty to locate research support.

2. Such offices primarily act as clearinghouses, making program information and funding opportunities known through a variety of means to members of the faculty.

3. There is no clear indication that initiatives taken by research administrators are as important as faculty competence and perserverance in the acquisition process.

C. A proposal to develop a computerized faculty research profile information system (RPIS) at CWRU was prepared[6] and its initial phase accepted by the University. This system when fully implemented would improve the flow of relevent information on matching faculty research interest and capabilities with research opportunities and needs of governmental agencies, industrial organizations, foundations, and academic units of the University. RPIS utilizes the essential characteristics of such systems now in operation at some corporate research and educational institutions and adapts such systems to the needs of this University. Current activities include the development and testing of faculty questionnaires and preparation of computer programs to process the required information and to conduct the required searches. Implementation is projected for 1976-77 with systems evaluation to be performed during this period.[7]

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[5]"A Survey of the University Research Administrator's Role in the Acquisition of New Project Support", Office of Research Administration, Case Western Reserve University, March 1976.

[6]"A Proposal to Develop a Research Profile Information System (RPIS) at Case Western Reserve University", Office of Research Administration, University Information Systems, and Department of Operations Research, Case Western Reserve University, January 1976.

[7]"A Review of the Development and a Proposal for the Implementation of a Research Profile Information System (RPIS) at Case Western Reserve University (Phase II)", Office of Research Administration, University Information Systems, and Department of Operations Research, Case Western Reserve University, July 1976.

and sponsoring organizational program opportunities.[2] A methodology for use in the conduct of this study was developed, along with questionnaires and interviewing procedures. Statistical tests were applied to the data collected to determine the specific reasons for information processing improvements. Alternative systems for accomplishing information requirement goals were proposed and evaluated using cost and benefit criteria. A sequential strategy for initiating a computer-based faculty research information system was developed.

B. A survey was conducted of research administrators at a sample of major U.S. institutions of higher education.[3] A written questionnaire was completed at the time of the interview. Information was collected on (1) annual university budget and research income; (2) faculty size and number of proposals submitted and awarded; and (3) research administration size, manpower, distribution, income, budget, and task performance. Research administration performance was evaluated for each of the institutions. A measure of performance was positively correlated with the annual research income of the institution and average annual research income per faculty member. Institutional research income and proposal success ratio was independent of the number of proposals submitted by the institution. Annual research income per faculty member is correlated with research administration expenses per faculty member. In all cases, the CWRU Office of Research Administration (ORA) performance was consistent with the group of private institutions normalized for faculty size and research income.

C. A study was conducted to examine the general nature of services, the methods of organization and the performance of the CWRU Office of Research Administration (ORA).[4] This office (ORA) was compared to comparable offices of research administration at nine other universities in terms of organization, costs of operation and self-evaluation of performance. A study internal to this University was conducted in order to learn the attitudes, expectations, needs and problems of academic and administrative persons in relation to ORA. This study included faculty members, department heads, and administrative aides in fourteen departments, two professional schools, and three centers or institutes. The primary results of these studies are the following:

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[2] "The Feasibility of a Faculty Research Profile Information System at CWRU", Technical Memorandum No. 378, Department of Operations Research, Case Western Reserve University, puly 1975.

[3] "A Comparison of Research Administration Costs and Performances at a Sample of Major U.S. Universities," Technical Memorandum No. 380, Department of Operations Research, Case Western Reserve University, July 1975.

[4] "Organization and Management of Research Administration at CWRU", Department of Organizational Behavior, Case Western Reserve University, August 1975.

professional schools of the University including Dentistry and Nursing.[5] Contacts with Dentistry and Nursing have already been made.

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[5]The major output of the questionnaire is to identify key words for matching purposes. Additional information is only necessary for directory purposes. At the present time, it is believed that a one-page questionnaire will be distributed to the faculty in the future.

2. A questionnaire to be completed by the faculty, and

3. A list of key words

A memorandum covering the first two items is provided in Appendix II.

It should be pointed out that the key words which were distributed to each faculty member were based primarily on the Stanford list with modifications, revisions, or additions from departmental chairmen. Of course, faculty members were encouraged to add key words as part of the questionnaire. It has been found in our related studies that a good set of key words is essential in obtaining faculty cooperation in preparation of the questionnaires.

Approximately 200 questionnaires were distributed to the CWRU faculty during the first week of April, 1977. Currently, questionnaires are being received and processed and it should be possible to put RPIS into a limited operation by the end of June 1977. Consideration will be given to further implementation in 1977-78 based on the reviews to be performed in July 1977.

MEDICINE

The first step in incorporating RPIS in MEDICINE, involving some 760 faculty members in 18 departments, was to obtain an improved key word list. The MESH system, as described in a Department of Commerce publication, ("The Medical Subject Headings Tree Structure", National Technological Information Service, 1977, 458 pages, National Library of Medicine, PB 255933) was the basis for the list which has been developed.

It is expected that the Medical School questionnaires will be distributed in June 1977. The questionnaire, key word list, and cover letter will be distributed by the Dean, School of Medicine. Key words

Information Systems, and Department of Operations Research, January 1976. The System when fully implemented would improve the flow of relevant information on research opportunities and needs of governmental agencies, industrial organizations, foundations, and academic units of the university to faculty members with specific research interests and capabilities. RPIS utilizes the essential characteristics of systems now in operation at certain corporate research and educational institutions and adapts them to the needs of Case Western Reserve University.

Recent activities include the development and testing of faculty questionnaires and preparation of computer programs to process the required information and to conduct the required searches. During 1976-77 an initial test and evaluation was performed following a final proposal submitted entitled, "A Review of the Development and a Proposal for the Implementation of a Research Profile Information System at Case Western Reserve University, Phase II, Office of Research Administration, University Information Systems, and Department of Operations Research", July 1976.

RPIS was developed as a part of the Research Management Improvement Project at Case Western Reserve University, as sponsored by the National Science Foundation under a grant to the university. The development phase was completed by June 1976.

It was decided in the Fall of 1976 to implement RPIS on an experimental basis. Discussions were held with the University Faculty Research and Scholarship Committee as well as various administrative officials in the university. In January 1977, Dr. Allen Moore, Director of the Office of Research Administration, initiated meetings with key administrators of

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THE UNIVERSITY OF TENNESSEE
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REPORTS AND ABSTRACTS

MANAGEMENT AND THE ACHIEVEMENT OF RESEARCH GOALS

1. Progress Report: Phases I & II (Problem Formulation and Diagnosis) April 1975

2. Progress Report: Phases III & IV (Review of Findings and Interventions) July 1976

3. Progress Report: Phase IV (Multiple Processes of Change) November 1976

4. Progress Report: Phase V (Evaluation) July 1976

5. Final Report, December 1976

6. New Technology For Organizational Life In Biomedical Research, Abstract, Program-5th International Congress of the Transplantation Society, p. 198, Jerusalem 1974

7. Management And The Achievement Of Research Goals, Abstract, Federation Proceedings 34: 857, 1975

8. Managing Conflict In The Research Laboratory, Abstract, Federation Proceedings 35: 814, 1976

9. Leadership And Administrative Skills For Physicians, Abstract, Presented October 24, 1975 at the Tennessee-Kentucky Regional meeting of American College of Physicians at Nashville, TN.

10. Organization Development At The University Of Tennessee Memorial Research Center, Research Management Improvement Bulletin 1 (4) 8-10, 1976. Presented at the Preconference Workshop on "OD in Health Care Organizations", Organization Development Network April 20, 1976, Philadelphia, PA.

****

This project was performed under a grant (NM-44246) from the National Science Foundation-Research Management Improvement Program. It was carried out at The University of Tennessee Memorial Research, Center for the Health Sciences, Knoxville in collaboration with the Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, University of Michigan, Ann Arbor. The investigators were: C. C Congdon, A.I. Chernoff, R.D. Lange, D.A. Lingwood, F.J. Miller, and W.C. Morris. Address requests for reports or abstracts to C. C Congdon.

Conference on University
Research Management
June 6 and June 7, 1977
New York University

MANAGEMENT AND THE ACHIEVEMENT OF RESEARCH GOALS

C. C Congdon, A.I. Chernoff, R.D. Lange, F.J. Miller

University of Tennessee Memorial Research Center, Center for the Health Sciences, Knoxville, Tennessee 37920

and

D.A. Lingwood and W.C. Morris

Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, University of Michigan, Ann Arbor, Michigan 48106

is applied rather than basic.

The establishment of an internal funding program (or grant support from a patent management organization) made available by way of a grant award to university researchers under carefully controlled criteria can help bridge the gap between conception and utilization of those concepts with good commercial promise. Typically a grant proposal should have as its objective the demonstration of feasibility at the end of one year at a cost (excluding overhead) of 15K to 20K normally used to support a postdoctoral candidate. The concept must be novel, should solve problems looking for a solution, and provide for a strong patent position. The commercial market should be large or growing. Finally, at the end of one year, the intent would be to license and/or to seek support from the private sector so as to subsequently bring the invention to the marketplace. Cost of the grant and any patent applications would be recovered prior to any distribution of royalties. Such a program, even if modest, would encourage disclosure of such breadboard concepts, enhance utilization of university-

with patents. He provides him with basic information with respect to the patent laws and gets him to "think" patent, to become "aware". He assists him in obtaining support for the demonstration of feasibility of his concepts. He promotes the utilization of the p.i.'s invention and generates royalties thereby. The patent administrator enables individuals from the private sector to visit but one person to find out the latest developments throughout the university or to make inquiry about developments that may have come to their attention.

The university should review its patent policy and, if appropriate, increase the equity to inventors and provide for departmental sharing as a suitable means for creating the necessary incentives for the principal investigator to disclose his invention to the patent administrator.

The cost of filing patent applications, unfortunately, is not reimbursable by the government or covered by the overhead rate. Both of these approaches require action by the government to increase costs at a time when there is pressure to reduce overhead rates. Another approach which can be implemented

described some of these techniques to you today. Techniques such as patent awareness can help but the job must be done by the university through commitment and support of its patent administrator who, in turn, must have the visibility that only support from the top can provide. It is in this area of visibility, in my judgment, that the patent management organization could be a significant factor.

What steps can be taken to increase the number of disclosures and to promote utilization of university-developed inventions?

The vesting of patent rights in the university under the proposed government-wide Institutional Patent Agreement (IPA) or better yet by way of Congressional legislation would be an important step in speeding the innovation process. Administrative burden would be substantially lessened, invention disclosures could be protected early, and prospective licensees could be openly contacted immediately after the filing of a patent application. Under an IPA, the university as a quid pro quo must have a patent policy, a patent agreement for faculty and staff, and a patent administrator as the focal point for monitoring

single university or university system. Their long-term success and established expertise is the principal reason as to why their long-standing arrangement with the University of Wisconsin has required no alteration.

The cost of a patent application by the university can be expensive with little likelihood of an early return on investment. Through a quirk in the law, if industry files a patent application based on federally funded research, the contractor is reimbursed for such costs, whereas the university would not be so reimbursed. There have been a variety of proposals from the university sector to provide funds not only for this purpose but for the patent administration costs in general. Recently, the president of SUPA in a letter to Dr. Donald S. Frederickson, Director of NIH, suggested that the university overhead rates be adjusted upward by less than one-half of one percent to earmark funds for patent administration costs. Pressure by the government to reduce university overhead rates makes any increase, no matter how worthy, doubtful. Presently the cost must be initially borne either by the university directly or

university. Dr. William Bissinger, in a talk given at the second annual SUPA meeting last year, made a telling point. In 1975 he visited with over 40 universities both in the United States and in Canada. He plans to make a return visit to those universities with a focal point and an agressive program; he may revisit those that had a marginal program; and he does not plan to return to those not having a focal point. The message is clear. Industry is willing to make an effort to promote the utilization of university inventions providing it can do so by making a reasonable effort within a reasonable time.

The university infrastructure which harbors many conflicting committees and viewpoints often sees patents as not worth the candle. Government compliance is often lax and rarely enforced. The path of least resistance becomes a policy of inaction. Such a malaise generally can only be overcome by a commitment from the university president to support a patent program. In such a climate, there is little incentive for a principal investigator (p.i.) to submit an inyention disclosure to his patent committee

DHEW and Ray Thornton, Congressman from the state of Arkansas. Latker, as chairman of the University Patent Policy Ad Hoc Subcommittee of the Committee on Government Patent Policy for the Federal Council for Science and Technology, has spearheaded the government-wide Institutional Patent Agreement (IPA) for universities which may take effect this year. Any governmental agency could, on a voluntary basis, avail itself of the Agreement, which is patterned on DHEW's, unless the Agency believes that it would be precluded from doing so by statute. Mr. Ray Thornton introduced on April 6, 1977, a bill to establish a uniform patent policy for inventions resulting from federally funded research and development entitled the "Uniform Federal Research and Development Utilization Act of 1977". Thornton benefited from the recommendations of Latker's committee. The bill would allow the contractor, including the university, to acquire title to inventions resulting from federally funded research. Said Thornton, "It is of serious concern to me that the legislative branch has failed to act to establish a mechanism whereby the fruit of federally sponsored research and development

program? The generation of such royalty income by universities for educational and research pursuits would clearly be in the public interest.

To answer the question, we must look to a variety of factors including:

a. vesting of patent rights

b. the degree of visibility and support for a patent program

c. the existence of a focal point

d. the university infrastructure

e. equity sharing for the inventor

f. the cost of patent applications

g. the soft-money syndrome

h. available mechanisms for developing concepts

i. the patent management organization

Let's look at each of these to obtain a better perspective of the problems and issues confronting the university in surfacing inventions developed as a result of its research so as to promote their utilization in the private sector.

In contrast, Italy and Russia, which offer no meaningful patent protection, have registered not one single significant pharmaceutical discovery in modern history."

The statement also illustrates that less than 5% of new drugs came from the university sector during that period. This is not unexpected or surprising when one realizes that federal funding to universities was not significant, that university researchers considered commercialization of their work unethical, that there was virtually no monitoring of university research, and that the primary agency for funding health care retained patent rights. What about today?

For the past several years universities have received federal funding at approximately a three billion a year level. Yet, of the one hundred leading universities that perform approximately 90% of all university research, only a small percentage have in-house programs wherein a systematic effort is made to identify, protect, and license inventions arising from such research. Emphasis has been in what to do

map maker. Upon consultation, I suggested that he request permission to reproduce. The response was that there would be no charge for the first twenty copies, and for any above that number, it would be one fixed charge of $25.00. Upon checking with the doctoral candidate, he said he would be satisfied to use fifteen copies. A letter was sent to the copyright holder indicating the use of the thesis and thanking them for the courtesy of permitting reproductions.

Some of the highlights of the new copyright law are: (a) a $10.00 filing fee; (b) libraries are not to reproduce more than one copy; (c) libraries are open to the public and misuse of its copiers are not the responsibility of the library; (d) the term of the copyright has been extended to the life of the author and fifty years thereafter; (e) a copyright royalty tribunal has been established to set rates, collect and distribute royalties, and to maximize the availability of creative works to the public, with the fair share of the returns to both the author and to the publisher. The new act is an excellent piece of legislation; we feel that it will be particularly attractive to the Universities.

for use in other countries. We are now negotiating for the translation into Spanish, Portuguese, and Arabic. Royalties received have been rather modest. The royalty distribution in this case is one-third to the author, one-third to the department of origination, and one-third to the University.

Another case that might be of interest was a work entitled, "Child Variance", which was supported by the Office of Education. Limited copyright was requested and obtained from NIE. Arrangements were made with the University Press, and a standard contract was prepared and approved by NIE. Subsequently we received a request from a Dutch Publishing House for publishing rights to a Dutch edition. For this agreement we received front money that far exceeded any of the U.S. efforts. But the real problem in this case was the number of authors involved, at least eleven. Considering the small amount of royalties, the matter of writing eleven small checks each year is quite a nuisance. This could have been avoided had I asked at our initial meeting that the authors waive any royalties in favor of the Institute of Mental Retardation and Related Disabilities. All verbally assured me that they were not interested in royalties and that such a waiver was not needed. However, since seven have departed the campus, we have a serious communication problem in keeping up with their change of address. What I am suggesting is that if you have several authors and anticipate only modest royalties, I do believe that you should ask the authors to waive any claim to any royalties and ask them to leave such royalties to their department.

One of the more interesting questions presented to us is the use of the various copyright symbols and the placement of same. In the course of our research, we have found that there are at least nine symbols or letters that could be used to indicate copyright. The most recent request we received was from a staff member who insisted that the copyright symbol be placed on the cover. While I had never seen such an example, I did check the copyright manual, that is the one used by the staff of the

University for the costs of development, distribution, and reproduction.

C. The provisions of A and B, supra, shall apply unless they are inconsistent with the terms of any applicable agreement with a third-party sponsor or provider of funds, in which case the University's agreement with such sponsor or provider shall control.

D. Patents, copyrights, and property rights in computer software resulting from activities which have received no support, direct, or indirect, from the University shall be the property of the inventor, author, or creator thereof, free of any limitation which might otherwise arise by virtue of University employment.

E. In cases which involve both University-supported activity and independent activity by a University staff member, patents, copyrights, or other property rights in resulting work products shall be owned as agreed upon in writing and in advance of an exploitation thereof by the affected staff member and the Vice-President for Research in Consultation with the Committee on Patents and Copyrights and with the approval of the University's Office of the General Counsel. It is understood that such agreements shall continue to recognize the traditional faculty and staff prerogatives and property rights concerning intellectual work products."

Some of our more interesting copyright problems during the past three years have been the publication of work study books, tapes and microfische cards. The old quote, "new tools bring new rules", held true to form. There were many staff meetings to resolve the questions; such questions as selection of publisher and royalty distribution. I would like to say that there has been some notable success with these new techniques in the field of education. Tapes and microfische cards are used extensively in the School of Medicine; another series of work study books

good reasons: the first is the possibility of a new source of revenue for both the school and the author; the second reason results from our contractual responsibility of the particular research grant or contract.

We have observed during the past years a very noticeable increase in the number of instructional aids; such as workbooks, manuals, audio-visual materials, microfische cards, tapes, etc. Much of this effort, but not all, has been under federal sponsorship, while the balance has been supported by University funds and certain foundations, the latter to present new copyright problems. In the case of federal sponsorship, as with patents, there is no standard policy. Hopefully, with the passage of H.R. 6249, sponsored by Representative Ray Thornton, the contributions of the grantee will be recognized. We well realize that the passage of such a comprehensive bill will take many months, if not years, and even then there can be no assurance that it will survive as written.

Despite our various basic agreements that we hold with certain agencies, we always check the particular grant or contract to ascertain just what we, as the grantee institution, may or may not do in the matter of copyrights. Through the years, we have managed to find three or four acceptable clauses. Without our mention of its particular sponsor, the following are a few of such clauses that we would like to see in any agreement: (a) Copyrights are left to the grantee institution; (b) Any royalties resulting under the sponsorship of this agreement are to be devoted to a continuation of the particular work; (c) Grantee and sponsor share equally in any royalties; and (d) Any royalties resulting from the work are to be devoted to research and graduate instruction.

A brief and coherent copyright policy is a must for any educational institution. Brevity should not obscure clarity; however, we have found that any extraneous material tends to confuse the issue. The leadership for a copyright policy should be

industry as well as significant opportunities for profit. UPI's licensing staff spends its full time in attempting to introduce new technology to industry. This staff brings to bear many years of experience in the licensing of inventions and offers resources to the University inventor, unavailable and unsurpassed anywhere in the world.

compared with the number received prior to the conduct of the Patent Awareness Program, and, in some cases, the number may have tripled. Interestingly enough in spite of an increased quantity of disclosures, the quality of these disclosures has not appeared to have declined, based upon Research Corporations standards for acceptance.

In summary, we believe that a basic Patent Awareness Program based upon a university patent policy returning a reasonable share of royalty income to the inventor, a reasonable share to the inventor's department and the balance for the general purposes of the university is an essential beginning. If this position can be followed with a continuing, well organized program of meeting with individual faculty members, particularly new ones, each year, thus providing periodic contacts for discussion of research results, a continuous flow of disclosures can be generated which flow will eventually lead to the development of royalty income that can be benefical both to the institution and the individual investigator.

and also from a study of newsletters and bulletins put out by the individual departments. During these interviews we tried to gain further insight into the specific research being undertaken and answer any questions that the individual faculty member might have in regard to the patentable nature of the research. Since the members of the Research Corporation staff who were conducting the seminars and interviews were familiar with the needs of the industry and the position of many industries relating to the licensing of patents, and, in general, with the requirements of the patent laws around the world most of the questions that were raised directly during the interviews could be answered immediately. These interviews were continued on a periodic basis for the entire two-year length of the program at each institution.

The program is now in its final stages at the last two of the eight institutions involved. At the outset of the program each individual institution was requested to make available records of the number of disclosures received by the administration on an annual basis for the five-year period prior to the onset of the Patent Awareness Program at that particular institution. These five-year figures will be compared with corresponding data for the two years of the program. At some of the institutions where the program was started earliest possibly three years of data after the start of the program can be compared. We are at present accumulating this date; our final report is expected to be available by December of 1977.

We have some obvious indications of the relative success of

general as a result of a more aggressive approach to the disclosure, patenting and licensing of inventions resulting from research. The individual faculty member was provided with some guidelines that could be utilized in determining whether or not an inventive concept has resulted from his research, and explaining exactly how in his university the disclosing of new concepts were to be handled. We described the various ways that a disclosure could be prepared and just what the exact relationship was between a disclosure and a publication. The seminar then went on to tackle several misconceptions that were found to be predominant amongest academic researchers who had little or no previous exposure to patents. The misconceptions dealt with the relative problems of patenting and publication and also with the role of government funding as regards title to inventions. We found that these two areas were the ones that were most generally misunderstood and thus, were the most deserving of discussion. The presentations always lead to questions of what any patent management organization will evaluate in studying disclosures, such as equity, patentability and licensability. We stressed the need for early recognition and disclosure of inventions, and particularly the need to have a disclosure evaluated prior to its publication date.

In setting up these departmental seminars we found several things that should be given serious consideration by anyone planning a similar program. For example, there was a great reluctance by faculty members to leave the building in which their research laboratories or offices were located to go to another building to attend a seminar. This meant that we

In mid-1974 Research Corporation received a grant to conduct a Patent Awareness Program at eight selected academic institutions in an effort to develop a method that might be generally useful in the academic field for stimulating technology transfer. The grant was supported equally by the Experimental Technology Incentives Program group at the National Bureau of Standards and the Research Management Improvement Program group at the National Science Foundation. The eight institutions were selected to provide a cross section of the types of academic institutions receiving sizable amounts of research funding from federal and state granting agencies. The institutions included both state supported and private universities, universities with attached Health Science Centers, some with Agriculture Schools and two that were primarily Engineering oriented.

Prior to selecting the eight institutions we contacted the top level administrators of each institution to make certain that the environment in which we would be working would provide an atmosphere favorable for technology transfer from university to industry. At each institution meetings were held with selected and appropriate members of the administration in an effort to obtain the maximum amount of personal cooperation from them. In all cases, we were able to obtain the sort of cooperation that we felt was needed and to establish the designation of the office of a member of the administrative staff as a contact office and one man as the official university contact for this program.

Our next step was to obtain records from each of the participating

MANAGEMENT OF JOINT PROGRAMS FOR ENERGY RD&D

The institutional setting and forms of institutional interaction for joint programs of research, development and demonstration will be described. The issue of who provides the program leadership will be analyzed with the aim of identifying the appropriate conditions when leadership should reside with an industrial firm, a university or a third party. Examples of current programs will be used to identify problems inherent in each alternative for program leadership as well as possible modes for solving these problems.

4/14/77
J.B. Bush

VI CONCLUSIONS

Taking all factors into consideration, and using the NYU-GASL laboratory merger as an example, it is recommended that PLAN B is adopted as a compromise. Indeed, this is the plan which is in effect at the time of this writing. PLAN B has limitations in that it does not fully resolve either the personnel relationships or the equipment problem. It does, however, generate savings in a fuller use of the laboratory equipment and personnel. On the other hand, a better plan would be the modified PLAN C in which a separate tax-exempt corporation would be organized with its capital equipment consisting of GFE and the remainder of equipment donated, or sold, by GASL to the new corporation. NYU's equipment would be transferred to the new corporation; however, decisions to implement modified PLAN C depend on such factors as the tax situation of GASL and of its stockholders. In any case, more than one or two academic participants would be required to produce a significant impact by the merged laboratory.

In the meantime, PLAN B is operating satisfactorily, aided, no doubt, by the good personal relations between the participants as originally generated by Dr. Antonio Ferri before his death.

and it is highly likely that GFE equipment can be transferred to a tax-exempt institution.

The closest operating version of an organization operating under Plan C is the UNI-COLL chared-computer corporation a wholly owned subsidiary of the University City Science Center in Philadelphia on a site of some 19 acres. UCSC is governed by a Board which includes the presidents of some 29 universities, colleges, and medical institutions as well as government agencies. Recently, in 1972, UNI-COLL became a wholly-owned for-profit corporation also governed by a board of directors drawn from the UCSC membership. By giving up its tax-exempt status, UNI-COLL achieved a better understanding of its posiyion and has enhanced its customer/owner involvement and simplified the raising of capital.

While this is an excellent plan to emulate in the merged laboratory organization under study, it differs in one highly significant point. UNI-COLL started by taking over title to the University of Pennsylvania large-scale computing facility previously supported by the National Science Foundation. Both in this and other equipment taken over by UNI-COLL there arose no similar problem of GFE transfer encountered as in the GASL/NYU situation. Furthermore, the UNI-COLL structure was "pure" in that the UCSC research institute is tax exempt and is controlled by educational institutions, including hospitals, devoted to the public interest. Certainly, if decisive recommendations are to be made relative to the merged NYU/GASL Laboratory, it is most desirable to deal with a "purified" situation in which a separate laboratory corporation and its controlling interest rest with a board drawn primarily from tax exempt institutions conforming to IRC-501(c)(3). This would enable the transfer of GFE equipment but would also require

SEPARATE CORPORATIONS SYSTEM (PLAN C)

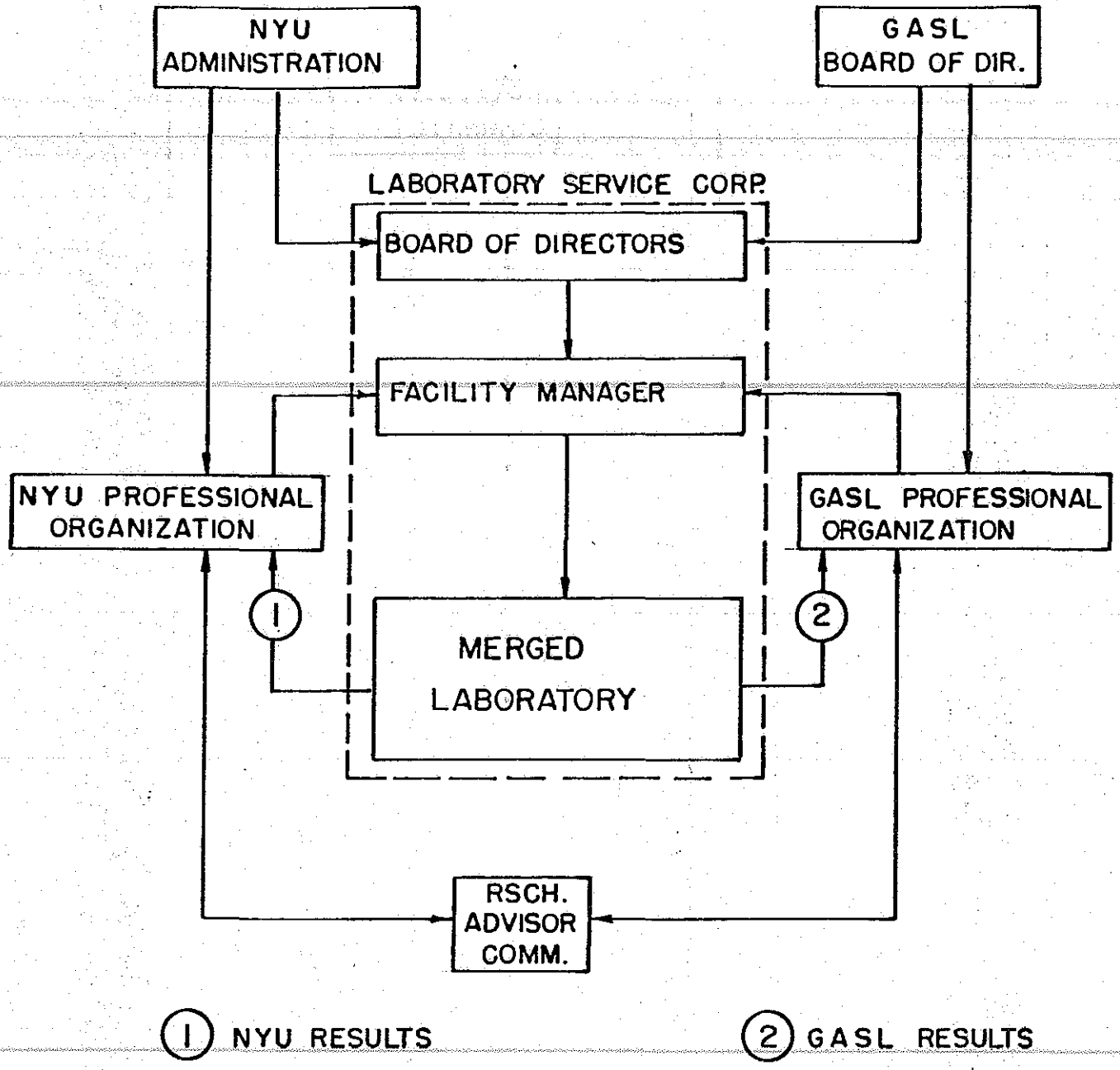


FIG 3

MINIMAL SYSTEM (PLAN A)

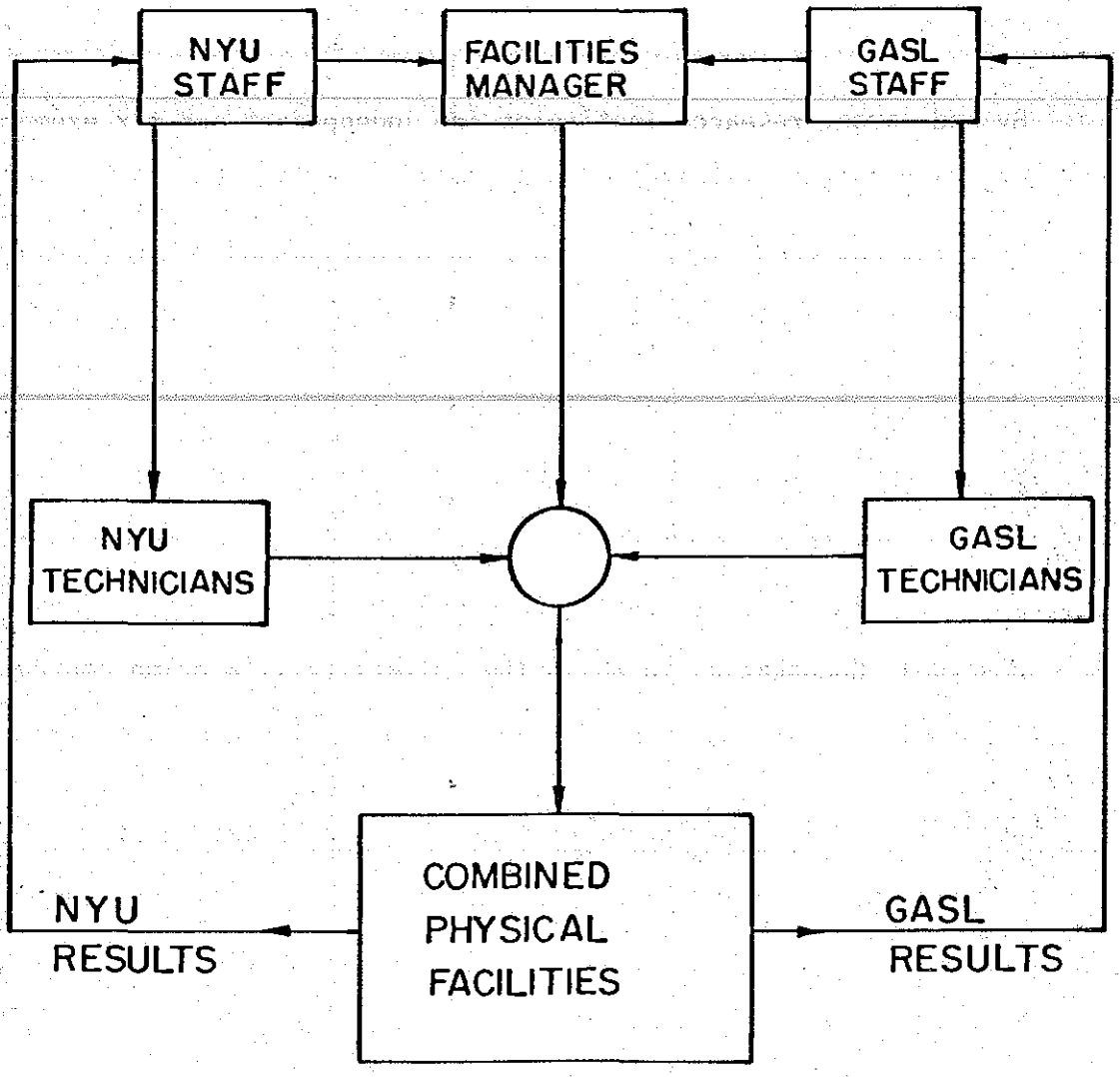


FIG. 1

V. ORGANIZATIONAL PLANS

Before making recommendations as to possible structures for the merged laboratory, the study panel requested Dr. Ragazzini to make a survey of existing consortia in the United States which might have similar characteristics to those of the merged laboratory consortium under consideration. It was found that there were four types of consortia which could be identified. These are:

1. Educational Consortia
2. National Laboratories
3. Research Foundations
4. Non-Profit Research Institute

Educational Consortia are generally composed of a number of colleges, usually small, who are banded together to bring about operating economics and to share certain facilities and educational programs. They bear no resemblance to the merged laboratory.

National Laboratories are established for the purpose of carrying out research in several fields requiring large-scale equipment and a steady source of funds. While having representatives on their Boards of Directors from industry they are, nevertheless dominated by universities.

Research Foundations are corporate structures which are formed for the express purpose of permitting state universities to negotiate, manage, initiate and sometimes supervise research projects. There is no resemblance between this type of research institution and the merged laboratory under study.

IV. PERSONNEL

An important factor in the successful operation of a merged laboratory in which personnel are employed by two separate organizations and yet work side-by-side carrying out the same or similar duties, is the possibility of invidious comparisons developing. To be considered are three classifications of employees:

1. Professionals (Faculty, Scientists, Mathematicians, High-level Administrators)
2. Technicians (Machinists, model makers, welders, Instrument technicians, Draftsman)
3. Clerical (Stenographers, Secretaries)

When GASL and NYU operated separate facilities before the merger decision, each carried a full staff each carrying full benefits granted by their respective organizations. For instance, technicians working for NYU produced a gross number of working hours at 2080 per year. Subtracting vacation time, sick leave, and holidays, there remains a total of 1800 for GASL and 1696 for NYU/sub-professional employees. Yet these employees would be working together under different schedules as employees of their respective institutions.

While technicians are "loaned" to one or the other organization and so charged, professional staff members from NYU prefer to remain under faculty rules. Thus, except for equipment and associated laboratory technicians it is necessary to maintain separate professional organizations. As the initial situation exists a system of cross-billing has been devised where one organization compensates the other for the services of each other's employees when used.

government to NYU thus eliminating the GFE Commingling restriction. This was actually done in the merged laboratory under study as that for its own equipment, no problem need exist for NYU.

On the other hand, GASL GFE being part of a "for-profit" organization, transfer of title is not permitted. The only way in which the GFE can be transferred to GASL is through purchase, but before such a purchase bid is accepted by the government, the equipment must be placed on the surplus list which is circulated to government and contractor laboratories and there is a risk that some other user may rightfully claim the surplus equipment.

Summarizing the rules and procedures which can be implemented for the conditions set down by regulations:

Equipment Sharing:

1. If NYU used GASL's GFE on government contracts, no payments are made. The facility contract officer's approval must be obtained. Only direct costs for material and electricity plus a fixed sum as a contribution to the overall laboratory maintenance costs is charged to the user.

2. If NYU uses GASL-owned equipment, GASL could demand a fee rental, but may waive this fee since there is reciprocation between GASL and NYU.

3. If GASL uses NYU-owned equipment, NYU can demand payment of a rental fee but need not do so since there is reciprocation between NYU and GASL.

4. If GASL uses NYU-GFE on government contracts, it can do so at no rental fee providing the facility contract officer approves.

5. In non-governmentally sponsored research, government approval and a rental payment for the use of GFE is required.

6. Use of NYU-owned and GASL-owned equipment is subject to internal arrangements by the two parties and does not involve the government.

Equipment Transfer Regulations:

1. GASL cannot normally transfer title to its GFE equipment to another corporation by independent action.

In addition to the above stock items, high-pressure shock tubes and a full jet noise facility is available. By merging the NYU and GASL equipment, some duplication of equipment results, however, this is desirable to cover situations where a stanby unit is operated while a piece of equipment is down for maintenance.

It is evident that for proper fabrication, maintenance and operation of such equipment, a full crew of technicians is required. Heretofore, two separate crews, one at NYU and the other at POLY were employed for this purpose.

To get some idea of the magnitude of the operation, the total gross volume of research grants and contracts serviced by the combined NYU and GASL laboratories averaged about $2 million dollars per year. Currently, the NYU effort has been expanding to include the field of energetics (hence the name ENERGETICS included in the title of this paper.)

II. BACKGROUND

The Aerospace Laboratory was part of the NYU School of Engineering and Science. For a number of reasons related to serious university deficits, The Board of Trustees decided to sell the University Heights Campus which housed the School of Engineering and its sister college, University College, to the City University of New York for use by the Bronx Community College. By the agreement of sale all NYU faculty were offered comparable positions in the Polytechnic Institute of New York and most technical equipment transferred to that institute.

The Aerospace Laboratory which is the subject of this study was located off-campus on the East shore of the Harlem River within walking distance of the main campus. It was deemed undesirable to continue operating the laboratory at its present location because of its isolation from the rest of the main Washington Square campus. Because of the use of heavy equipment, possible hazards and noises the Aerospace laboratory could not be moved to the main center at Washington Square. Thus three alternatives presented themselves: Sell the Harlem River property and

1. Discontinue the Laboratory entirely
2. Move the Aerospace Laboratory to a new location
3. Merge the Aerospace Laboratory with some industrial or university facility having similar supportive equipment and research interest.

Of these three alternatives, the first was rejected because it would remove from the list of available operating laboratories of this type. The second was impractical because of the difficulty of finding a suitable site. The

I. FOREWORD

Professor John R. Ragazzini is listed as the author of this paper. However, it should be pointed out that the paper is the product of a panel collaborating in the study. The panel consists of:

From New York University

1. Dr. Antonio Ferri, Vincent Astor Professor of Aerospace Science, Director of New York University (NYU(Fluid Dynamics and Energetics Laboratory, PRINCIPAL INVESTIGATOR (Deceased December 1975).

2. Dr. John R. Ragazzini, Professor of Applied Science, former Dean, School of Engineering and Science, CO-PRINCIPAL INVESTIGATOR.

3. Dr. Dale E. Zand, Professor and Chairman, Department of Management, School of Business Administration.

4. Dr. Richard Freedman, Associate Professor of Management, School of Business Administration.

5. Dr. Gabriel Miller, Associate Professor of Applied Science.

From the Polytechnic Institute of New York

6. Dr. Martin Bloom, Professor of Aeronautics, former Dean, Polytechnic Institute of New York (POLY).

7. Dr. Robert Cresci, Professor of Aeronautics, Assistant Provost, Polytechnic Institute of New York.

in the company, and (c) problems and strengths of communications.

The study also led to specific recommendations for improvements in R&D planning, organizational structure, team development, management interface, and provided the framework for developing a system of generating and retrieving technical reports.

- The Science Center provides consulting services to the Industrial Research Institute Task Group on the Communication of Scientific and Technical Information (STI). This group was formed to: (a) advise federal agencies about national policy on STI, (b) assure that industry perspective is involved in plans to develop new STI services, (c) define current practice in industrial R&D in utilizing STI and (d) formulate plans to meet industry's unmet needs for STI.

  The Science Center provides background data and information needed to accomplish the above tasks, relates the work of the task group to academic researchers and policy makers in the information industry, conducts surveys to obtain additional data, and organizes and conducts demonstrations of innovative new services.

- An analysis was performed on the cracked plates in a ship's hull to determine whether cracking occurred before or after an explosion.

- An analysis was made on underground furnace oil tanks to determine different causes of failure and their probability.

- An investigation was made of a truck parking lot to determine whether surface failure was the result of natural conditions or excessive unwarranted use.

A UNIVERSITY - INDUSTRY INTERFACE

by

Robert K. Soberman

University City Science Center

Philadelphia, Pennsylvania

The University City Science Center was organized in 1964 by the leading business, academic, professional, and government interests in the Delaware Valley to focus regional resources in the application of scientific and technical knowledge to improve the quality of human life. This objective was to be addressed by conducting cooperative research activities, providing regional services, promoting information exchange, and constructing an urban research park to house organizations and companies engaged in a wide range of educational, communications, health, engineering activities and related support services. It was created as an independent non-profit corporation now jointly owned by 28 universities, colleges, medical schools, and hospitals.(*) It's board of directors includes leaders from member institutions, business, industry, government, and the community.

*The American College
Bryn Mawr College
The Children's Hospital of Philadelphia
Delaware State College
Drexel University
The Greater Philadelphia Foundation
Hahnemann Medical College and Hospital of Philadelphia
Haverford College
Lafayette College
Lehigh University
Lincoln University
Medical College of Pennsylvania and Hospital
Mercy Catholic Medical Center of Southeastern Pennsylvania
Pennsylvania College of Optometry
Pennsylvania College of Podiatric Medicine
Pennsylvania Hospital
Philadelphia College of Osteopathic Medicine
Philadelphia College of Pharmacy and Science
Philadelphia College of Textiles and Science
Presbyterian-University of Pennsylvania Medical Center
Swarthmore College
Temple University
Thomas Jefferson University
University of Delaware
University of Pennsylvania
Villanova University
The West Philadelphia Corporation
Widener College

relations began early because as a fledgling organization beginning 18 years ago, we depended upon the expertise of people at the universities to help us write proposals and act as consultants in carrying out our project work. As we have developed we have had an influx of students graduating from each of the three institutions which provided ties back to their parent universities. Some of our people have found that contract research is less their bag than university research and have moved from our organization to the university setting. A number of our people, while full-time employees of the Institute, are adjunct professors at one or more of the universities where they may teach a course in their specialty thus augmenting the university faculty.

There are many other instances in which the staff of the several organiztions compliment each other to the extent that cooperative projects are undertaken. In such cases, either the university or the Institute will be prime contractor, depending upon where the greatest part of the expertise lies, and the other organization will be a subcontractor. Our working relations with the universities is very flexible and almost any kind of arrangement can be made.

The Research Triangle Institute believes so strongly in the value of close university ties at the working level that two years ago we established an Office of University Relations in which I, as director, and my secretary constitute the total staff. To quote the president of the Institute, Mr. George R. Herbert, "The mission of this office shall be to undertake programs which shall contribute to the expansion of cooperation and collaboration in all areas of mutual concern to the Institute and the Triangle universities." I initiated this mission by visiting faculty members of the universities discussing their research programs, describing any pertinent work at other institutions of which I was aware, attempting to determine if there were any research needs that were not being met, and trying to help fulfill those needs when they existed, and in general, trying to learn about and disseminate information on the research resources and capabilities of the four institutions.

One particular program has grown out of this action which is worth mentioning in more detail. Shortly after establishing the Office of University Relations, one of the universities requested the Institute to undertake patent management of inventions rising from the university research. We looked into the feasibility of undertaking such a service for the universities and decided that it would be a worthwhile undertaking on behalf of the universities. Our objective is not to make money on this program but to recover the costs of performing this service. One of the important reasons that the universities requested us to undertake this was the knowledge that close personal contact with the inventor was an important part of a patent management service. Our geographic proximity made this easy. This has become one of the functions of the Office of University Relations and occupies much of my time. However, the activities I undertake in such a program further the mission of this office because it gives me specific contacts with various university people engaged in

The not-for-profit research institutes, on the other hand, are generally organized to field teams of personnel made up of those disciplines necessary to effectively attack the particular problem with which they are faced. The individuals who work in such organizations are interested primarily in applying knowledge to the solution of problems. Research institutes contract with a client to apply their best efforts to solve a particular problem in a given amount of time for a given amount of money. The primary objective is solving a particular problem or understanding it better.

The organizational breakdown of a research institute is into fields of interest. For example, the "departments" at RTI have such names as Center for Development and Resource Planning, Center for Health Studies, Center for the Study of Social Behavior, Energy and Environmental Research Center, Center for Technology Applications, etc. Each "department" contains personnel representing the several disciplines necessary to work in the field of interest.

This mix of disciplines in each division of the not-for-profit research institute emphasizes the interdisciplinary nature of the research teams which can be formed to attack problems.

Now the final element in the research picture is the industrial research and development laboratory. In a fundamental way it is the most important because the dollars generated by the industrial sector ultimately supports the research efforts of the university and research institute. Here there is a strong basic thrust toward the development of a marketable result whether it be a process or a product.

The objectives, measures of success, and personnel complement of these three research elements are different. Given a new phenomenon, university research seeks to understand it better (new knowledge), the research institute asks how it can be used to solve problems (application), and industrial research and development asks how can it be used to make a marketable product (commercial usefulness).

The success of the university researcher is measured by the number of papers published, the success of the institute researcher by the ability to satisfy the client's needs, and the success of the industrial researcher by his contribution to the company's profit picture.

Because of the different objectives and measures of success, the research attitudes of the individuals involved in the three fields are quite different. Recognizing that there is a range of research attitudes in each of the three settings, nevertheless, let me attempt to characterize the median researcher in each setting. The university researcher gets his satisfaction from discovering something no one else has discovered and disclosing it to his colleagues. The institute researcher gets his satisfaction from solving a problem posed by a client. The industrial researcher gets his satisfaction from seeing a new process or product go on the market to which he has made a contribution. Each of these research settings has a distinct environment and research personnel do not move easily from one to the other.

THE ROLE OF THE NOT-FOR-PROFIT RESEARCH ORGANIZATION

by Ralph L. Ely, Jr.

The Research Triangle Institute is a not-for-profit research institute. This describes its corporate structure rather than the nature of the research undertaken. However, it is a good place to start because it leads to the reasons that such research organizations exist. RTI is one of 15 not-for-profit research institutes in the United States. Each of them has a character of its own but there is a family resemblance. In describing not-for-profit research institutes, it is instructive to learn why they were started.

The first such research institute was the Mellon Institute which was founded in Pittsburgh in 1927. Actually, the idea had its beginning in 1913 when a Department of Industrial Research was founded at the University of Pittsburgh by Dr. Robert K. Duncan who believed that the research capabilities of universities could be of value to industry. He convinced several industries to support research on industrial problems at the University of Pittsburgh under industrial fellowships. Much of the support for this program came from Andrew W. and Richard B. Mellon who recognized the merit of using scientific research for the development of industry and, through it, for the benefit of mankind. Thus it was in 1927 that the research program was moved from the University to a new building constructed by the Mellon brothers and incorporated as a not-for-profit organization. The Mellon brothers realized that if this institute was to help bring science to industry, it should not be hampered by ties to any special interest group. By making it not-for-profit, it could more effectively serve the public interest. The value of applying research results to industry was thus demonstrated and by 1936 the Battelle Memorial Institute of Columbus and the Armour Research Foundation (now known as the Illinois Institute of Technology Research Institute) had been founded on the same not-for-profit basis.

These three institutes formed prior to 1940 resulted from the recognition that research could be of value to industry. It was World War II that forced research into further prominence. In response to the demand for better and better materials of warfare, the research community was marshalled to tackle the many problems associated with developing a superior fighting machine. The principal sources of scientific knowledge were the university research personnel. They temporarily abandoned their search for knowledge to apply that accumulated information to solve the problems of war. They devoted their efforts to developing the atomic bomb, radar, sonar, inertial guidance systems, and electronic control equipment. This might, indeed, have been called the electronic war but for the development of the atomic bomb which overshadowed the major advances that were made in electronics during this period.

Conference

University Research Management

June 6-7, 1977

Schedule

Monday, June 6, 1977 — Meyer Hall, Room 121

8:00-9:00a.m. — Registration and Check-in

9:15-9:30a.m. — Opening Statement: Dr. L. Jay Oliva
Vice President for Academic Affairs
New York University

9:30-10:00a.m. — Address: Honorable James H. Scheuer (D-N.Y.)
Member of Congress; Chairman, DISPAC

10:15-12:30p.m.

Panel I on: "Joint University-Industry Research Management"

Chaired by: Sidney G. Roth
Associate for University Relations
ERDA

Dr. Ralph L. Ely, Jr. Director, University Relations Research Triangle Institute	"The Role of a Not-For-Profit Research Organization"
Dr. Robert K. Soberman University City-Science Center Philadelphia, PA	"A University-Industry Interface"
Dr. John R. Ragazzini Dean Emeritus, School of Engineering and Science New York University	"A Merged University-Industry Laboratory Facility"
Dr. Maurice J. Sinnott Associate Dean, College of Engineering The University of Michigan	"Analysis of University-Industry Programs Sponsored by the Department of Defense"
Dr. John B. Bush, Jr. Manager, Advanced Energy Programs General Electric Company Research Operations Corporate Research and Development	"Management of Joint Programs for Energy R, D & D" (Research, Development & Demonstration)

2:00-4:00p.m.

Panel II on: "Management of the Products of Research:

Chaired by: Victor Medina,
Assistant Director
Office of Sponsored Programs
New York University

Robert Goldsmith Research Corporation	"Patent Awareness Programs"
A.S. Alpert, Esq. Vice-President; Operations and Secretary University Patents, Inc.	"University Patents, Inc.- Its Relationships with Universities"

