

Report of

THE PRESIDENT'S RESEARCH DEVELOPMENT COMMITTEE

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I. INTRODUCTION

In March 1980, President Giamatti established at Yale the Research Development Committee to examine and advise him on issues involved in increased cooperation between the University and industry in the area of research. The following report is the Committee's attempt to identify the problems and opportunities on the local scene and to suggest some possible courses of action. We have focused primarily on the natural and mathematical sciences, and have not specifically addressed related issues of interest to the Social Sciences, Law, and Organization and Management.

The appropriate form and effective development of the long neglected interface between universities and industry is the subject of intense national debate within and between universities, industry and the Federal government. At the level of public policy, these discussions have been fostered by a general perception that "technology transfer," the use for the benefit of the public of information and ideas developed in basic research laboratories, has at many universities been neither as effective nor as rapid as it should be. The Federal government is, for example, reviewing its rather restrictive patent policies and regulations in response to recent legislation designed to streamline technology transfer for universities and small businesses.

Major research universities are beginning to question their detachment during the past three decades from the concerns of the government and industrial laboratory. It is increasingly apparent that such a division has not been to the advantage of their teaching and research. In view of a shrinking market in the governmental and academic areas, students are turning to industries as likely employers and demanding instruction in applied areas. Industrial concerns are examining whether closer and broader contact with the talent and facilities available in academic institutions would be beneficial. Economics play a role for both groups, as universities question the adequacy of compensation for the use of their research and seek to diversify the sources of income in support of that research, and industry recognizes that, in terms of dollars expended, over three quarters of all basic research is performed in universities or in non-profit laboratories under their direction.

Yale has shared these general national concerns, but also has several specific reasons for currently reviewing its policies. For example, recent extraordinary advances in molecular genetics have attracted interest in the University's strong research in this area and have generated new interest among Yale faculty in applications of their work. In addition, recent movement of headquarters of major research-based corporations to Fairfield County enhances Yale as the

primary, local research university. The agreement with Bayer-Miles and planned development of a Yale Liaison Program also signal the University's increased interest in working with the private sector. On the New Haven scene there is the possibility of a Research Park, to be set up on the Winchester site in close geographic proximity to the Yale Campus.

It must be noted, however, that this interest represents a significant shift in University thinking, as Yale has in the past provided fewer incentives for contact with the corporate sector than have most of its major counterparts. Coupled with a slow pace of industrial development in the New Haven Area, this history has placed Yale behind other major universities.

Potential Educational Benefits

In August 1980, the National Commission on Research published "Industry and the Universities," a report developed by scientists and administrators representing industry, academia and the government. It provides an excellent and balanced discussion of the opportunities and potential problems of increased interaction between universities and industry (see Appendix 1). The Research Development Committee supports the major conclusions of that Report. Recommendations included later in this document represent proposals for specific implementation of some of the Report's more general suggestions.

Increased cooperation in research between Yale and the industrial sector can be beneficial to the individual research worker, both faculty and student, and to the University as a whole. The experience of various faculty members already shows that, in favorable circumstances, exposure to the concerns of industry serves to broaden horizons and provide intellectually stimulating research problems at the very frontier of their professional fields. Faculty and students gain access to a new group of professional colleagues, their laboratories and large-scale research facilities. Advanced students become aware of job opportunities that would otherwise be unrecognized or overlooked. Teaching and curricula are improved with new information and approaches and occasionally with direct input by industrial research personnel, and equipment.

Potential Financial Benefits

A secondary benefit to the University of increased research cooperation with industry is financial, with incremental funding to be derived from royalty income, direct research grants and special instruction funds. Funding by industry frequently offers the advantage of a lower level of bureaucratic red-tape and regulation than often attends federal support. Effective individual contacts may also be expected, on occasion, to result in broader-based departmental and University funding. As shown below, Yale lags many of its counterparts in the level of industrial funding for research.

We should not hope that such funding will become a major portion of total research support. In an address to the American Institute of Physics on 30 Oct 80, Dr. George Pake, Vice President for Research at Xerox and Past-Provost at Washington University in St. Louis had some interesting comments on the potential for dollar flow between industry and universities:

Since most of the funding for university basic research is already derived from Federal tax revenues, to which corporations give up about half of their pre-tax earnings, it is difficult to imagine company managements justifying to their stockholders (or for that matter to themselves) the expenditure of even a fraction as many basic research dollars in universities as they do in their own organizations. Furthermore, if the companies supported university research to the tune of, say, 10% of their own basic research budget, it would provide at most only a 3% increase in university research funding. However welcome that might be, the point remains that the resources simply are not present in industrial R&D funds to carry an appreciable portion of the support of academic research--at least under present long-established tax laws.

While these comments put some perspective on the overall potential for research support from industry, the impact of such support in selected areas may be much larger.

From the data for 1978 shown in Table 1, one can see that, excluding the University of Rochester, industrial funding represents an average of 2.5%--at most 5%--of total research funding at the major schools listed, even MIT. Even in the absence of a major increase in total industrial support we should raise the dollar amount of Yale's industrial funding from its current paltry level. Further, the diversification of income sources and the potential flexibility thereby attained will have far more impact than might be inferred from the dollar value alone.

Financial benefits to the University increase with the level of direct involvement with industry. Focusing on the difficult questions of contractual and financial involvement, Donald Kennedy, President of Stanford University, outlined the options clearly in a recent speech:

- I. University as licensor, collecting royalties directly.
- II. Separate corporation as licensor, developer, and supporter of research; no relation to University except through agreed sharing of royalty income.

TABLE 1

Excerpts from: "Academic Science: R&D Funds, Fiscal Year 1978, NSF-79-320"

R&D EXPENSES AT Ph.D. GRANTING INSTITUTIONS (in millions of dollars)

		Sources of Funds					Other
		Total	Federal	State/Local	Industry	Institutional Funds	
U.S. Total	M\$ 4530(100%)	3003	406	166	603	352	
	% 100	66	9.0	3.7	13.3	7.8	
N.E. Total	M\$ 452(10%)	358	9.3	15.2	32.3	37.6	
	% 100	79	2.1	3.4	7.1	8.3	
Connecticut	M\$ 89.1(2.0%)	68.9	1.7	1.3	11.2	6.1	
	% 100	77.3	1.9	1.5	12.6	6.8	
Yale	M\$ 53.5(1.2%)	47.2	0.5	0.5	2.0	3.2	
	% 100	88.2	0.9	0.9	3.7	6.0	

NATIONAL RANK IN TOTAL R&D \$

Rank*		Sources of Funds						
		Percentage by Category						
		M\$	Total	Federal	State/ Local	Industry	Institutional Funds	Other
1	MIT	119.6	100	85.4	0.7	4.7	0.6	8.7
6	Stanford	88.2	100	89.2	0.3	1.1	4.6	4.8
8	Harvard	84.1	100	75.7	0.3	4.0	6.3	13.8
9	Cornell	83.4	100	65.6	18.4	4.3	4.7	6.9
10	U. Penn.	76.5	100	68.5	0.8	3.4	13.1	14.2
11	Columbia	74.6	100	80.3	0.7	0.8	3.8	14.6
15	Johns Hopkins	65.2	100	82.3	3.2	0	3.7	10.7
19	U. Chicago	58.1	100	76.1	0.5	1.8	10.2	11.4
21	N.Y.U.	55.6	100	74.6	1.0	4.5	9.4	10.4
23	U. Rochester	54.3	100	66.6	2.4	11.8	13.0	6.1
24	Yale	53.5	100	88.2	1.0	0.9	3.8	6.0

* Rank is based on the full list including state supported Universities. The private institutions have been selected as providing a more homogeneous group for comparison.

- III. Separate corporation as licensor, developer, and supporter of research; University faculty/administrators involved in governance.
- IV. Separate corporation as licensor, developer, supporter of research; would also engage in final production. No University involvement, though faculty (as individuals) could be involved in governance.
- V. Separate corporation as licensor, developer, and supporter of research; would also engage in final production. University faculty/administrators involved in governance; University has equity position.

Although the possible financial advantages increase with the level of University involvement, so do the clear and present dangers. The decision on where to stop requires the risk-benefit analysis in which so many universities, including Yale, are now engaged.

Potential Risks and Impediments

Potential risks and impediments to successful interaction between the university and industry begin with their very different corporate structures. An industrial corporation is generally vertically organized, with clearly defined lines of responsibility, and one, or a limited number of, recognized and accepted goals toward which all parts of the organization are explicitly directed. A university, in contrast, is essentially a horizontal organization, a loose affiliation of individuals who find the corporate structure a convenient umbrella, but have central reporting requirements only in limited areas. This group has widely differing personal goals and senses little collective and unified purpose. As a result, close institutional collaboration between these entities is extremely difficult. There is, however, the very real possibility of useful interactions among individuals. The objectives of corporate management on each side should be to identify individuals whose interaction would be mutually beneficial and to facilitate these contacts.

Although there may be mutual interest in research in a clearly defined area, the time frame of this interest is often very different. It is not uncommon for an industrial concern to limit its involvement to projects with 3 to 4 year payoffs. Most academic research is projected over a much longer time as, of course, is that of some well-known companies. This short time interval does not preclude joint industry-university programs, but it does restrict the options. (It should be noted, however, that research support from private foundations and the government is normally doled out in 3-5 year increments, and that there is very real pressure on academic researchers to produce results within these time blocks.)

Another major concern is the extent to which, through industrial support, the University research effort will be directed towards company interests and thus, by implication, away from problems the investigator wishes to pursue. Apart from philanthropic giving, any corporation entering into a research contract will have in mind a specific objective although it may be very broadly conceived. "Academic freedom," "lack of direction," "investigator-initiated research" are catch phrases which have useful and proper overtones, but are misleading in their implications about how most research is actually supported. With very rare exceptions, even among private foundations, all research support today is "directed." Any investigator applying for government or foundation support carefully selects the proposed topic and describes it so as to maximize the chances of funding. Fortunately, there is a sufficiently diverse set of objectives among funding agencies that, although each operates with a clear picture of its own "direction," an investigator can generally find a match with his interests. Thus, the "directed" nature of the research is not felt as strongly as one might fear. This diversity of interests and support options also exists in the industrial arena.

The primary concern is the conflict between industrial proprietary rights and the academic commitment to freedom of communication and publication of research results. The differences between the two types of institution are most clearly drawn, and it is here that difficulties in establishing useful collaborations are most likely to occur. Inextricably entwined with this issue are problems of faculty time commitment, remuneration and conflicts of interest. Such problems are covered in a general way in the Faculty Handbook, but the guidelines must be reexamined in light of recent pressures. In addition, there may be a significant increase in the involvement of postdoctoral associates and graduate students in industrially supported research. Great care is necessary to protect the interests of these groups which may differ from those of the faculty. They are also more vulnerable than the faculty to possible exploitation.

After years of "benign neglect" of the industrial community, Yale cannot expect to develop a thriving corporate interaction overnight. Should the University decide to move in this direction, steps should be carefully planned and taken at a sustainable pace. A considerable amount of reeducation within the University community will be required. It is essential to obtain tacit support for the proposed developments of at least a strong majority of the faculty. A preliminary survey among many of the science departments both in FAS and the Medical School has indicated such support in those particular sectors.

In the corporate world, there is a perception that Yale has a virtually impenetrable ivory tower philosophy. Altering that perception will require action and not documents such as this. We should proceed firmly, but bite off small chunks and expect progress to be difficult, but rewarding.

SUMMARY OF RECOMMENDATIONS

1. We reaffirm our previous recommendation that the University set up an Office of Cooperative Research to foster the flow of research ideas between the University and private industry. The Office would support and encourage direct contacts between interested faculty and industrial researchers; assist in establishing joint research projects; increase activity and assist in the filing of patents and drawing of licensing agreements; and, in general, serve as a focus for information flow and assistance to both faculty and industry. (We are pleased to note that the University has acted favorably on this recommendation.)

2. We recommend several changes and additions to the current version of the University Patent Policy: a broadening of present procedures for filing patent applications; a general description of licensing agreements including the appropriate use of exclusive licenses; a more detailed description of the development and distribution of net royalty income.

3. We discuss the problems related to faculty commitments and responsibilities and recommend certain changes in the current version of Section XIII of the Faculty Handbook of February 1981 as follows:

a. A new section, on additional considerations for research sponsored by industry, stresses: severe limits on any time restriction on publication in consideration of company interests; employment of students, postdoctoral fellows, or staff on industrially funded research without their knowledge and consent is forbidden; scrupulous attention to third party interests when joint use of equipment or space is involved; ability of faculty to withdraw from sponsored research groups without restraint on future research activity.

b. The requirement to obtain permission for each individual consulting arrangement, that falls within the general rules, has been deleted. This policy is replaced by a requirement that a faculty member report in writing on outside professional activities if requested to do so by the departmental chairman, the Dean of the Faculty or School or the Provost.

c. When extensive outside activities for sustained periods of time appear imminent, the University should make greater use of various options where maintenance of a University affiliation appears appropriate: unpaid leaves of absence; part-time appointments for a two-year period with the possibility of returning to full-time status; adjunct appointments with resignation from regular faculty position.

d. A section on receipt of common stock or other form of equity by either the University or individual faculty members and the extreme care required to ensure no distortion of fundamental purposes and obligations.

4. While the charge to the Committee is very broad, involving industry in general regardless of its geographic location, there are some special concerns within the New Haven area. The Olin Corporation has proposed creation of a Research Park on an 80-acre site in New Haven. It has been proposed that the development of this land be a three-way effort on the part of Olin, Yale and the City of New Haven. The intent is to attract to the Park small, high technology companies or the research components of larger corporations to whom mutual association and the adjacent Yale scientific community would be particularly attractive. We recommend that the University play an active role at the policy level in establishing and running the Research Park on the "Winchester Site" in New Haven.

5. We recommend that the University Patents Committee and the Research Development Committee be combined into a single Committee on Cooperative Research, Patents and Licensing which would assume responsibility for the relevant functions of both of the other committees. The new Committee would provide policy and advice to the Office of Cooperative Research and to the Provost on matters relating to patents, licenses, and research interaction with industry.

II. OFFICE OF COOPERATIVE RESEARCH

In December 1980, The Research Development Committee recommended to President Giamatti creation of a Yale Office of Cooperative Research to foster the flow of research ideas between the University and private industry. The Office would support and encourage direct contacts between interested faculty and industrial researchers; assist in establishing and encourage joint research projects; increase activity in patents and licensing agreements; and help improve the general effectiveness of interaction between Yale and the private sector.

It was recommended that the Office be established initially with a Director who should become familiar with the research activities of the faculty, the research and technology interests of individual companies and patenting and licensing procedures. He or she should report to the Provost to ensure close coordination with academic objectives. Since that time, the Provost and Provost-designate have been asked to create the Office, including hiring a Director and developing a budget.

In recommending formation of the Office, we emphasized that it should be intended as a support unit for interested faculty only. It should not become involved in existing faculty-corporate arrangements. Its activities should be separate from corporate fund-raising. We recommended limiting its initial focus to the natural and mathematical sciences (including the Medical School) because of the immediate potential for industrial research interest and individual faculty's interest as expressed to the Research Development Committee.

Our recommendation was based on the following benefits to the University resulting from fostering increased cooperative research with the industrial sector:

1. Enhanced educational opportunities for faculty and students resulting from exposure to problems and applications related to their basic research;
2. Expanded thinking about research opportunities through insight into the development of innovation and technology in the industrial sector;
3. A more open, creative, approach to working with industry on issues of mutual interest and concern;
4. New sources of funding for individual faculty and departmental research;

5. Increased corporate giving resulting from improved perceptions of the University.

The University can best realize these benefits and meet the interest of faculty and corporations by centralizing in one office responsibility and primary priority for gathering and providing information on research activities and possibilities for cooperation and applications. Interested faculty will be better served by having one, clear, place to go for information and help, and corporate people should welcome the University's efforts to respond to and facilitate their interest in faculty research.

The following text is taken from the paper originally presented to the President.

Responsibilities

The Office of Cooperative Research would have the following responsibilities:

1. Develop Knowledge of Research Work and Applications -
The Director should become personally familiar with faculty research work in order to identify and discuss possible uses to which that research can be put. He should eventually prepare a catalogue of University facilities, equipment and research work and should then stay in close contact with interested faculty to remain familiar with their research and encourage them to use the Office as a support resource. Departmental liaisons should help catalogue research in their departments and identify a few faculty members with strong potential research applications.
2. Support Patenting and Licensing -
The Office should provide faculty with information on the patent process and suggest patents on that research, where appropriate. Most ideas should still be referred to Research Corporation, as they provide objective expertise which would be difficult and expensive to duplicate here (we leave to the Patent Committee the question as to whether Research Corporation is the best patent/license organization for our needs); the Office should follow progress of the patent application and licensing process and keep the faculty member informed.

The Office should have additional options on patenting and licensing, including to hire, through the Yale General Counsel, patent counsel and arrange licensing; interest a company in patenting for a discounted license agreement; or

allow the inventor to pay the legal fees in exchange for patent and royalty rights. In many cases, the Office may suggest that patenting is not necessary to bring an invention to market.

3. Work with Corporations -

The Director should become familiar with selected corporations who might be interested in basic research conducted at the University. In addition to building personal contacts, he should work with faculty members familiar with corporations in their field, alumni and the Office of Corporate and Foundation Relations to identify Yale alumni and other contacts in management, technical and research administration positions.

The Office should facilitate corporate involvement with University research, including licensing of ideas and technology, funding for personnel, facilities and equipment and establishment of joint research projects. It should suggest such arrangements where appropriate and respond to corporate interest in University research and facilities.

4. Work on Research Park and Other Major Projects -

Such cooperative activities will primarily involve individual researchers, but more comprehensive arrangements, such as the Yale-Miles agreement, may occasionally result from the Office's work. The Director should work with faculty and administration to develop agreements in each case which are consistent with the University's academic objectives and policies.

The Office should also become an important resource as planning proceeds on the Research Park, especially in providing information on individuals or research activities at Yale which might be of interest to potential Park clients. Formation of the Office should be seen as a significant contribution to the Park project.

Staffing

As head of this Office, Yale's first Director of Cooperative Research must work with the Provost and Cooperative Research Committee (see page 4) to specify the long-term objectives of the Office and plan the steps to arrive there. His primary role will then be as an "advocate," developing personal contact with faculty and corporate people. The Director's ability to administer an office and deliver an interest generated will also be extremely important, although in the Office's early stages, he will need to rely on the Offices of Grants and Contracts and Corporate Relations for much of this administration.

With these roles in mind, we have developed a position description (see Exhibit 1) which emphasizes senior-level

responsibility for developing new programs within a technically-oriented organization and strong personal skills. The Director must also be something of an entrepreneur and personal risk-taker, as the potential of and commitment to the effort at Yale will be unclear for some time.

These characteristics fit a wide range of people, so we cannot specify the place or organization we should begin our search. There are several places, however, where we can seek the right individual, and it should not be that difficult to find and identify that person.

People with appropriate backgrounds would include:

1. A person with a technical, corporate background who would have the benefit of being familiar with technology and corporations, and probably the ability to get things done. This person's primary drawback could be lack of understanding of and frustration with the University's generally slower procedures;
2. An academic with corporate contacts. The drawbacks here could be some problems dealing within the corporate structure, as well as a poor career path for a scientist;
3. A consultant with a technological background who would have technical expertise, as well as an understanding of commercial aspects of research. Again a major problem seems to be career path, as our job would be less prestigious and promising for such a person;
4. A research or patent administrator from industry or a university.

We can proceed to find such a person by advertising in selected academic, business and general news journals; canvassing faculty and other contacts, many of whom will have candidates to propose; canvassing our corporate contacts for people within their own organization or recent retirees; looking at a few relevant consulting and/or legal groups for such an individual; looking at professional organizations such as the Society of Patent Administrators and the Society of Research Administrators; looking within the Yale faculty and administration.

Reporting Relationships

The Director should report to the Provost so that the Office's activities will integrate with and enhance the University's academic objectives and faculty will perceive it as a support resource. We would leave definition of the working and reporting relationships within his office to the Provost, but emphasize the need for close coordination with the Offices of Grants and Contracts, as both offices

will work with faculty research and with many of the same individuals, and with other Yale units dealing with corporations.

The Director and Provost should work with a faculty-administration Cooperative Research Committee which would review the Office's progress, monitor University policies which affect application of faculty research and recommend changes when required (while outside the scope of this recommendation, we will discuss further with you the desirability of forming one combined Research Committee, incorporating the current Research Development, Sponsored Research and Patent Committees, with subcommittees having more specific responsibility for cooperative research, patent policy, etc.).

Evaluation

The success of the Office should be evaluated over a five-year period to avoid incentives for short-term results, undue pressure for faculty participation and acceptance of lower-standard corporate agreements.

Faculty perceptions of support provided to them can be measured by contacts made with the Director, initiated in both directions, faculty-generated ideas, patent applications filed, patents granted and royalty income earned.

Evidence of success in developing corporate relations will include new licensing, joint research projects, funding for University research facilities, equipment and personnel and overall corporate giving. While much of this will derive from work of other University units and trends in the economy, we should expect the Office's activities to result in growth above the current levels of \$0.9 million of corporate research funding and \$9,700 of patent royalty income.

The Director should develop a long-term plan for the Office, indicating objectives, timing and responsibilities, including those of related groups. The plan should include interim steps against which progress can be measured by the Provost and Committee on Cooperative Research, Patents and Licensing.

Budget

We recommend a first-year budget of up to \$100,000, to include salaries and benefits for the Director and an Assistant/Secretary, travel, legal and consulting fees and office expenses.

We anticipate several types of financial support from industry aimed directly at specific parts of the research effort at Yale. (Note that this support is to be clearly distinguished from general gifts from industry in support of the University as a whole.)

1. Royalty income from patent licenses;
2. Royalty income from non-patent licenses;
3. Gifts in support of specific projects or investigators;
4. Research grants that include the standard indirect cost component.

Items 3 and 4 are readily distinguishable. For a gift there are only the most general rules governing the use of the funds, no requirement to return unspent balance at a specified time, and no detailed financial accounting. For a grant, the research aims are normally clearly specified, the time interval fixed and detailed accounting is required.

Where the Office has played a role in arranging support under 1, 2 or 3, we suggest that an amount up to but not exceeding one-half of the University share of net income be credited to the Office account to help defray administrative costs. See Section III and Appendix 2 for a detailed discussion of royalty income, its distribution and uses.

Research grants, item 4, which result from the activities of the Office should be carefully noted in the annual report and should be credited to the Office in establishing its performance record. However, the expenses of the Office should not be added to or recovered from the standard indirect cost pool.

The funding of the Office has two components: a) start-up costs, and b) on-going running costs. We hope that the Office would become self-supporting as soon as possible but that cannot be expected for the first few years. We suggest that the general support mechanism discussed above be implemented immediately while recognizing that such income for the first few years will not meet expenses. There are various possible mechanisms for providing those start-up costs. These range from straight attachment of general funds, through possible contributions by interested departments, to fund-raising efforts for this specific purpose. Each possibility has variations and both advantages and disadvantages. The Committee does not feel that it is appropriately constituted to provide detailed advice in this area. The experience of other universities may be useful at this point. Successful efforts such as the Office of Technology Licensing at Stanford should be investigated before detailed operating procedures are firmly established.

Exhibit 1

Position Description

Yale University

Director of Cooperative ResearchObjectives

1. Increase cooperation between University and corporate research.
2. Increase opportunities for development and commercial application.

Responsibilities

1. Develop a plan specifying objectives and progress for the Office of Cooperative Research.
2. Develop a comprehensive knowledge of faculty research work.
3. Investigate possible areas of cooperation and application of faculty research.
4. Administer the University's patenting and licensing program.
5. Advise faculty on consulting agreements and financial arrangements, if requested.
6. Identify the research and technology interests of individual corporations.
7. Respond to and initiate corporate interest in University research.
8. Work with the Research Park project and potential clients to provide information on University research activities.
9. Identify possible joint research projects and institutional arrangements between University and corporations.

Qualifications

1. Experience relevant to the creation and management of a technologically-oriented organization, is required.
2. Strong interpersonal skills, appropriate in academic and corporate settings, are required.
3. A degree in the Sciences or Engineering is preferred.
4. Knowledge of patent and licensing procedures, research administration and academic and publication practices is preferred.

III. PATENTS, LICENSING AND TECHNOLOGY TRANSFER

Background and Perspective

Inventions arising from basic research in a university setting are generally an unexpected by-product of the larger goal of enlarging man's store of knowledge. There are exceptions of course, such as the development of medical instrumentation in a clinical department, but for the most part Yale faculty do not set out to make patentable inventions or discoveries. Further, to be patentable, an invention must be "new" and "useful" - criteria which have precise meaning in the federal laws and regulations. Most basic research discoveries are described in the open literature and become the building blocks with which later discoveries and advancements are made.

The growth of federal funds for research at Yale during the 1960's brought an increasing variety of patent clauses in the grants and contracts. While the wording of these provisions varied between federal agencies, they all required that Yale assume responsibility for learning about and reporting to the federal government any inventions involving federal funds. In response to this obligation, a Committee on Patents was appointed with members drawn from the faculty and administration. The Committee prepared a Patent Policy which was adopted and incorporated in the initial Faculty Handbook in 1966. The policy was revised in 1974 and remains unchanged since that time.

Yale's Patent Policy

The purpose of Yale's patent policy is "to help assure in the public interest that the patentability (or other means of exploitation) and practicability of inventions will be evaluated by qualified persons, and that the income from inventions will be used to support further research or other desirable University activities and to provide remuneration to the inventor or inventors ... as long as the invention is productive of royalties."¹

Yale has had since 1954 a non-exclusive agreement with the Research Corporation in New York which provides for the evaluation of inventions. Research Corporation is a non-profit foundation which will patent and commercialize inventions which it accepts, sharing any net income from licenses between the inventor(s), the University and the Research Corporation. In 1966, the arrangement provided 15% to the inventors with the balance split equally between Yale and Research Corporation. The agreement was revised in 1974 to provide for 42.5%

¹Yale University Patent Policy, 1974 (see Appendix 2).

to Research Corporation, and 57.5% to Yale. The Yale share is to be split equally between the inventor(s) and an internal research fund benefiting the area from which the invention arose.

Yale is not obliged to refer inventions to Research Corporation, but may make other arrangements for evaluation and licensing. When Research Corporation rejects an invention, and when Yale has no further interest in it, rights to the invention may be transferred to the inventor if the terms of the federal grant do not preclude this.

Experience with Yale's Patent Policy

Royalty income from inventions administered by Research Corporation has increased gradually during the 1970's. Some data showing the level of activity are presented below:

<u>Year</u>	<u>No. of Disclosures Evaluated</u>	<u>No. of Projects Being Administered</u>	<u>Yale's Royalties</u>
1969	8	4	0
1970	7	6	0
1971	5	6	0
1975	8	6	\$1,178
1976	11	7	7,114
1977	12	11	10,394
1978	10	10	8,396
1979	4	11	14,179
1980	11	14	9,718

Day to day administration of the patent policy is the responsibility of the Director of Grant and Contract Administration, who also serves as secretary to the Patent Committee. The role of the Patent Committee in past years has been primarily to update the patent policy when necessary, to review the annual reports of Research Corporation, and to address any specific patent matters referred to it. It has reviewed the qualifications of alternative patent management firms, and has reviewed the technology transfer programs of other universities. In the mid-1970's the Committee concluded that significant growth in activity and income was unlikely to occur if Yale depended solely on the infrequent visits of Research Corporation staff supplemented by the efforts of the Office of Grant and Contract Administration, the primary responsibilities of which lie in other areas. Convinced that focussing responsibility on a full time in-house expert was the best way to stimulate interest, activity and income, the Committee discussed with the Treasurer the need to hire such an expert. However, it was the judgment of the Administration that it could not endorse creation of such a position without assurance of almost immediate pay-off in the form of increased income from royalties, an assurance the Committee was unable to provide. The proposal was therefore tabled.

New Federal Patent Policy

Yale has worked directly and through other groups in support of legislation to streamline federal patent policy. The Dole-Bayh Bill was finally passed as "The Government Patent Policy Act of 1980". Implementing regulations are now being drafted under the guidance of the Office of Management and Budget, and they should be in effect by July 1, 1981.

The new and beneficial feature of this law is the presumption that universities (and small businesses) will automatically retain title to any inventions arising from federal grants and contracts. This is a reversal of earlier federal policy which presumed public ownership of title as well as the use of non-exclusive licenses. One outcome of the new rules is likely to be a very substantial drop in our burden of justifying title to patent rights. We now have to do this on a case by case basis, with much of the burden of preparing the justification falling on the inventors. This burden may have been a disincentive for busy faculty to disclose inventions and explore patent opportunities rather than simply dedicate the invention to the public through publication in the open literature.

Suggestions for Change

The Committee feels that increased development of the University's basic research through patenting and transfer of technology to industry is desirable both to allow society to benefit from useful products and inventions and to provide financial payment for support of University research.

As discussed above, several internal and external factors have contributed to the fact that Yale has seen little faculty interest or success in applying for patents on University research or commercially developing that research. We recognize that this is a long process, with few big "wins" and many patents which will result in no income, but feel that stronger encouragement and support by the University can lead to increased faculty awareness of patentable ideas and interest in pursuing them. One obstacle to the aggressive exploitation of opportunities for patents and technology transfer at Yale has been the absence of an experienced full time administrator assigned to set up a program and make it work. Another has been the cumbersome and unenlightened federal patent policy. Last fall Congress acted to remove the latter, and the recommendation in this report that an Office of Cooperative Research be created has the potential to remove the former.

The Committee met twice with the University Committee on Patents to review the 1974 patent policy. The outcome of these meetings is a suggested revision to the patent policy which is Appendix 2 to this Report. In addition to reflecting the existence of the Office of Cooperative Research, the recommended changes provide the framework for a vigorous internal patent and licensing capability. The use of

exclusive licenses is spelled out with attention to the requirement of the licensee to actively develop and market the licensed invention. Severe limitations are placed on any restriction on the right of communication and publication of research results. Recognizing various options for processing a patent application, a new formula is suggested for splitting royalty income to provide recognition and incentives to Yale inventors while covering direct patent-related expenses and some part of the direct operating costs of the Office of Cooperative Research, when appropriate.

There has been considerable criticism of the Research Corporation for various reasons. We feel, however, that they (or a similar licensing organization) can continue to provide a valuable service to the University in conjunction with the more aggressive support provided by the Office of Cooperative Research. The Office will probably wish to refer many patent ideas to an outside group which can provide objective expertise which would be difficult and expensive to duplicate at the University.

IV. FACULTY COMMITMENTS AND RESPONSIBILITIES

As part of its charge to determine if, and how, the University should encourage and support closer research relationships with private organizations, the Research Development Committee has reviewed the basic principles of faculty commitment to the University. We have been especially concerned with principles, and their practical implementation, relating to outside interests of the faculty, including non-academic employment, consulting, patenting and ownership relationships with private organizations. Most of these principles are enunciated in the Faculty Handbook (February 1981), and in the following report, we recommend additions or changes in the Handbook where appropriate. We attach for comparison the current and recommended revised sections of the Handbook on outside employment, industrial-sponsored research, adjunct and part-time appointments, division of income, equity relationships and conflicts of interest (see Appendix 3).

In considering the impact of increased outside (specifically corporate) activity on faculty members' service to the University, basic issues with which we have been concerned include:

1. How can we enhance achievement of the University's basic purposes?
2. To what extent is it appropriate for faculty time and energy to be devoted to commercial research projects?
3. What is the appropriate relationship between a faculty member, and the University, and a corporation seeking to profit from the use of faculty research?
4. How should the commercial rewards from use of faculty research be distributed among society, University, individual researcher, participating private business?
5. What safeguards may become necessary for all members of the University community who might become involved, including students, postdoctoral fellows, staff?

The Faculty Handbook enunciates the following principles to define the faculty's commitment to the University:

1. The individual's service both to the University and to outside organizations should be governed by the obligation "to preserve and enlarge man's store of knowledge and impart it." The factor determining whether outside employment, including consulting, is permissible is whether the activity in question will enhance the

faculty member's professional competence and hence better equip that individual to serve the University.

2. The amount of time (and implicitly energy) an individual faculty member can use for such outside activities should not interfere with "the individual's overriding obligation to the University," which includes meeting classes, making time available to students outside classes, carrying his/her share of committee work, and maintaining progress in his/her own research programs.

3. Faculty research results should be freely disseminated, without constraint by government classification or business proprietary interests.

4. The economic benefit, if any, of such outside activities accrues solely to the individual faculty member. (The principle is implied by omission rather than explicitly stated.) Where research results in inventions that are patented, royalties are shared between the inventor and the University.

5. Responsibility for adhering to these institutional principles, and for handling potential conflicts, rests in the first instance with the individual faculty member.

We endorse these principles and believe they should not be fundamentally altered. They comprise the foundation upon which the University and its faculty have created the environment of commitment to Yale and its scholarly purposes. We regard the principle of faculty self-regulation as vital, and the University should not attempt to control closely or monitor in great detail the remunerative outside activities of the faculty. At the same time the faculty should be careful to fulfill their overriding obligation to their University duties.

Our recommended changes in the Handbook's regulations therefore seek generally to limit, and where appropriate decrease, the amount of bureaucracy, legislation and regulation imposed on the faculty and to facilitate closer industrial research relationships. We have, however, included statements to protect the rights of students and staff involved with faculty in industrial research projects, to assert the University's right to a share of income resulting from research developed under University auspices, and to limit the University's role in companies in which equity ownership is involved.

Outside Activities

We support the Handbook's general definition of appropriate outside activities as those which "enhance" the faculty member's professional competence and hence better equip that individual to serve the University." The focus on the amount of faculty time and

energy spent on outside activities, not income earned, is appropriate and desirable.

We recommend eliminating the requirement that faculty report to, and obtain approval from, their department chairman or dean for every case of outside employment, a policy that is overly burdensome and apparently rarely followed. This should be replaced with a statement that, when asked by the Provost, dean or chairman, faculty are required to provide a written report on the time devoted to and the organizations involved in their outside professional work. Cases of abuse should be referred to the Provost. (An exception to this general policy is, as we discuss in detail below, that faculty should be required to report and obtain approval for any situation involving a potential conflict of interest.)

We have also added a statement that one function of the recommended Office of Cooperative Research is to help faculty, at their request, review and negotiate agreements with outside organizations to protect important future patent and income rights for the individual and the University. While faculty use of the Office would be voluntary, we hope the offer would be taken up because we are concerned about possible violations of federal funding requirements and the inadvertent signing-away of patent and income rights, for both the individual and the University.

Necessary Safeguards for Research Sponsored by a Commercial Interest

A faculty member or the University may arrange to support research with corporate funds and/or personnel. We recommend under the section "Sponsored Research" the addition of a new section on "Additional Considerations for Research Sponsored by Industrial Companies." We have included here a statement reaffirming the principle that any research in which University personnel and/or facilities are involved may have only very limited and well defined restrictions on discussion or publication. We are especially concerned with protecting the rights of graduate students and postdoctoral fellows who may become involved in faculty members' commercially-sponsored research, and we also fear possible conflicts if government funding has been involved at any stage in the process.

Adjunct or Part-Time Appointments

It is possible that faculty will become so involved in outside research-related activities for such sustained periods that they are no longer able to meet adequately their overriding obligation to the University. This seems particularly likely when faculty become actively involved with a company utilizing their research. They should then be prepared to resign from their regular faculty position. The University may well not want to lose their valuable, if diminished, services. We recommend a policy statement which allows

three options at the discretion of the Provost, dean or department chairman:

1. Faculty will be allowed to take unpaid leaves of absence within the normal leave regulations of the University to pursue these outside interests for a limited time period.
2. Departments may want to consider the use of the "adjunct professor" category with its restricted rights to participate in departmental or University decision-making bodies and exclusion from the faculty tenure track. This seems a reasonable and desirable approach, but one should note that reappointment to the regular faculty would require the availability of a position and the full appointment procedure.
3. For an interim period up to two years, faculty may be allowed to have half-time appointments, maintaining departmental and tenure track rights, to pursue outside interests. Thereafter they would be expected to resume a full-time position with its responsibilities, to be appointed to adjunct status, or to resign. This option should be used with care and caution so as not to undermine the "overriding obligation to the University."

In a related issue, departments may wish to consider adjunct appointments for outside persons from industry with appropriate education and experience. The policy should allow such appointments, with approval of the Provost following the standard procedures for appointments in FAS. (This practice is followed in some of the professional schools, but only rarely, to our knowledge, in FAS departments.)

Division of Licensing Income

University policy currently contemplates income resulting only through royalties related to patented inventions. The patent policy calls for sharing such income (after costs) between the individual faculty member and the University.

We recommend extending this policy to other forms of income earned from the use of research developed with University support (as defined in the patent policy), including income from licensing without a patent and a share of equity in the company. We believe the University has a right to share in the benefits resulting from use of its resources. It should generally redeploy them to support further research in the originating department, and also to support important educational or research activities elsewhere in the University.

We continue to believe, of course, that the present practice whereby no portion of payment for a faculty member's consulting or

other permissible outside activities, as described above, should accrue to the University.

Payment of Equity

We believe it may be appropriate, under well-defined circumstances, for the University to accept equity as payment for use of its research, but recommend additional procedures when equity is involved. Receipt of equity in a company may be seen both as a form of payment and as a form of ownership and control. These two should be kept distinct. The issuance of shares may be essential for a small company facing capital needs, and a reasonable way for the University to participate in the uncertainty of possible future benefits.

It is, however, the ownership and control implications of equity, and the possible distortion of University policy, about which we are concerned for many of the reasons cited by Donald Kennedy, President of Stanford:

Among the questions that were undoubtedly asked (at Harvard), as they have been elsewhere, are these: Is it a conflict of interest for the University to have strong equity commitments to one faculty research program and not to others; might it, for example, create the appearance of carrying extra weight in the appointment and promotion process or in the allocation of facilities? Would the institutional commitment to proprietary work interfere with principles of accessibility and free communication that have been traditional elements in the academic process? Would the University's equity relationship to the work of faculty members create special problems in the context of other institutional responsibilities? For example, would criteria for determining investor responsibility, in place at most major private universities with large investment portfolios, be applied as objectively to these ventures as to all others....

We therefore recommend that the University never seek to start, control, assume a managerial role, or make a direct financial investment in a company established as a consequence of Yale-supported research (i.e., we would neither accept a majority share of equity in any such company nor invest University funds in it, except through purchase of publicly-traded stock in the endowment). We also recommend that the Committee on Cooperative Research, Patents and Licensing (or a subcommittee) review all cases in which equity may be paid to the University to ensure no distortion in the purposes of the University and its research activities.

This policy is not intended to prevent the University from assisting faculty in locating appropriate external sources of funding for a start-up company.

The payment to a faculty member for consulting services may also be in the form of equity, especially with smaller start-up companies. In comparison with the standard cash-for-service arrangement, the assumption of an ownership role, albeit inadvertent, may subtly change the relationship between the faculty member and the company. One might expect that receipt of stock in a closely held corporation, where liquidation of one's holdings is difficult or impossible, may provide special pressures. Such difficulties will be enhanced if the equity payment to the faculty member is made in return for services as a director or a company officer rather than simply as a consultant. Great diligence on the part of individual faculty in recognizing a potential conflict is certainly necessary in all of these cases (see Appendix 3).

The faculty member therefore will be expected to report in writing to the Provost, chairman or dean all instances in which payment of equity will be involved. Each case will be reviewed by the Committee on Cooperative Research, Patents and Licensing.

Other Conflicts of Interest

As is evident from our discussion above, enhanced faculty and University interaction with private corporations increases the possibility that conflicts of interest will arise in a variety of forms. The fundamental conflicts arise for faculty between outside interests and meeting the primary obligation to the University, and for the University between its commitment to research and full dissemination of knowledge undistorted by economic benefits of particular research projects and investments. There is considerable room for disagreement among individuals in both the faculty and the administration over which issues actually represent conflicts, or the severity of any perceived conflicts.

The Handbook includes only a limited statement about potential conflicts of interest: "A special kind of problem may arise when an individual has a consulting agreement or there is substantial personal interest in an organization which manufactures equipment that is purchased for use in research and/or instruction at Yale or is otherwise active in the field of such research." We find this wording confusing, and recommend a change to state more generally that faculty members must scrupulously report and obtain prior approval of business between the University and an organization in which they have an active personal or financial interest. Faculty members may be employees, owners or directors of companies which might do business with Yale, in the form of consulting, research, selling of equipment and supplies or provision of financial or legal services.

Some Examples: While the Committee feels that the primary responsibility for recognition and action on potential conflicts of interest must lie with the individual faculty member, some examples in areas other than faculty time commitments may be useful. The

following situations actually have occurred in the recent past or may easily occur through oversight or ignorance. These examples are intended solely to suggest warning flags for possible conflicts; they are not intended to suggest uniform solutions where each situation may represent a special case.

a. Compromising the Interest or Legal Responsibility of the University.

1. Oral or written agreements, frequently in the form of consulting contracts, which assign patent rights (title, licenses and/or options) to an industrial employer or sponsor which relate to research or activities conducted under university auspices.

2. Acceptance of proprietary data or information as part of a research project conducted on University premises, which thereby unacceptably compromises the ability to publish or otherwise disseminate the research results.

3. Informal arrangements involving the use of University personnel, equipment or resources without an agreement as to the appropriateness of the study or the compensation due the University for such services.

4. Actions as a consultant or as a company officer which imply endorsement by the University of an activity or product or the use of the University name; as a minor example, use of the University letterhead on company business.

b. Violating the Third Party Interest of the Federal Government.

1. Use on an industrially supported project, without specific permission arranged through the University, of personnel or of supplies or equipment paid by or obtained through a federal grant.

2. Provision of equipment or services to international corporations or to foreign governments which may fall under the U.S. requirements for high technology export license clearance. (Note that simply talking to a foreign representative under certain circumstances may be construed as illegal transfer of technology!)

Definition of Inventor

We note that the Federal Patent Laws and Yale Patent Policy define and recognize the rights of all inventors associated with a given licensed invention. There are no restrictions on the basis of employment status, assuming the definition of inventor or coinventor is met. Any member of the Yale community, faculty, student or staff, or those outside of Yale when appropriate, may be recognized as inventor or coinventor and may share in any royalties received as described in the Patent Policy (see Appendix 2).

V. PROPOSAL FOR A RESEARCH PARK

In early 1980, the Olin Corporation expressed an interest in converting much of the property known as the 'Winchester Site' into a Research Park. Discussions were initiated between Olin, the City of New Haven and Yale University, concerning this proposal and its ramifications. This considerable block of land, between 60 and 80 acres immediately adjacent to property owned by Yale, is presently covered with vacant or sparsely occupied buildings. The proposed development of the Research Park would be independent of final decisions on the presence or location of the Winchester Arms division of Olin which now occupies only a small portion of the land under consideration.

The discussions were temporarily halted when the possibility of attracting the Cummins Engine Co. to New Haven materialized. All three local corporate entities worked together in attempting to attract this company with the Olin land as an inducement. The location of Cummins in New Haven would have been very beneficial for the City and the local labor force. Cummins eventually decided against New Haven as a possible location, and discussions on the Research Park resumed during the summer of 1980.

The general plan is to attract high technology companies to this site. The major emphasis would be on research and development although light manufacturing might occasionally be involved. It is expected that the close geographical proximity of the companies to each other and to Yale would be useful in recruiting efforts as it has been in similar parks elsewhere. The first stages would be to remove most existing buildings, to improve the roads, services and utility supplies, to develop an overall plan for the area, and to construct a building on speculation.

The proposal is still in a tentative form with no signed agreements in place. The most likely scenario includes the formation of a non-profit corporation with the three partners, Olin, Yale and the City, having equal representation on the governing board. The Board would be responsible for setting policy for the development and management of the Park.

Olin's contribution would be the gift of the land in staged parcels. The principal funding would be arranged by the City from a combination of programs at the Federal, State and City levels. Some of the needed dollars are already in hand. Yale would supply no direct funding. It would, however, supply the time and effort of some of its senior administrative personnel, and it would offer assistance

to tenant companies in the form of access to certain of its facilities and introductions, where appropriate, to specific faculty or faculty groups with professional competence in the area of interest of the company.

Before entering into any formal relationships that might be patterned on the above points, President Giamatti asked this Committee for its opinion on whether or not Yale should become involved in the Research Park. We were asked to consider:

- a) What advantages would accrue to the University and were they sufficient to command the administrative time that would be involved?
- b) Whether the Park would be perceived as an extension of the Yale campus and thus demand the constraints on permitted activities which are currently in effect for the campus proper?
- c) Would such perceptions be enhanced or diminished by the decision to directly participate in the management of the Park?
- d) How would Yale's stand on all these issues affect the possible success of the Park?

In attempting to respond to these questions, some of the Committee members have examined descriptive material on a number of Research Parks in different parts of the country. There are some common threads, but none of the Parks are identical to each other or to the situation presented by the Winchester site. The closest approximation may be the University Science Center in Philadelphia. This is an inner city project initiated in a depressed area as part of a redevelopment program with participation of a number of educational institutions including the University of Pennsylvania. Two of the Committee visited this project and met with its managers.

On the basis of general discussions within the Committee there was a strong consensus that Yale should become directly involved with the Research Park project at the policy level represented by membership on the Board of Directors. This decision was based on a unanimous feeling that Yale would benefit by a general increase in the number of professional personnel in the Greater New Haven Area, these individuals being associated with either profit or non-profit organizations with strong technology and/or research components. The Research Park is perceived as a nucleus which might help in attracting industrial organizations to the whole region.

In a preliminary communication to the President on 23 Dec 1980, the following points were made:

- 1) We believe that there would be distinct and direct benefits to Yale from appropriate development of the Winchester site:
 - a) The educational and research objectives of the University would be promoted for both faculty and students by the presence of New Haven of advanced industrial research activity, and especially of the personnel that this implies.
 - b) Such activity would provide increased professional employment opportunities for Yale related personnel, for example faculty and student spouses, and could be expected to provide a significant number of short term internships for both graduate and undergraduate students which would help in evaluating career goals.
 - c) This type of industrial activity would lead in the longer term to improvement in the economic and social environment of New Haven, a general Yale concern. The activity in the Research Park should improve the ability of the City to attract more production oriented activity within New Haven and the greater New Haven area.
 - d) The Research Park would significantly improve land use in areas immediately adjacent to the University.
- 2) To the extent that the Research Park is perceived externally to be "part of Yale," this perception:
 - a) will be controlled solely by geographical proximity;
 - b) will be independent of whether or not there is any formal involvement of the University with this development;
 - c) will not be under the control of the University whatever stance it may take.

As a result, it is in Yale's interest to be part of the development, and thus to influence the composition and lay-out of the Park.
- 3) It is of paramount importance to maintain the integrity of the University with regard to its accepted norms for teaching and research. It is essential, and it is perfectly possible, to maintain a clear distinction between the Park plus its tenants and the Yale campus.
- 4) It will be impossible to attract to the Park any significant number of research organizations if they are expected to

operate, under all conditions, by the normal University standards of freedom of inquiry and communication. In any formal documents of incorporation:

- a) A general statement of principle that the development of the Park will favor tenants whose research emphasis is in the basic areas, and where collaborative research both between companies and between the companies and the University frequently would be useful and effective.
 - b) A statement that tenants are certainly at liberty to pursue proprietary research and that University involvement at this level, if any, will be restricted to faculty consulting according to standard Yale practice for any external affiliation.
 - c) A statement that close collaboration between faculty and/or students and any tenant, such as would be implied, for example, by a joint research project, would require that the tenant corporation agree to conduct the collaborative effort under the general principles for University research; free access to information; the right and responsibility to disseminate and publish the results of the research.
- 5) The Office of Cooperative Research would serve as the principal channel for initial communication between the tenant corporations and the Yale community, as it will hopefully do more generally on the national scene.

During recent discussions with Olin, with Moran, Stahl and Boyer, the consulting firm employed by Olin, with the City administration and with several industrial corporations, it became clear that in the absence of a visible Yale involvement, the development of the Research Park will be extremely difficult, perhaps impossible. In the view of the Committee, this involvement need not be particularly onerous.

Yale is already a partner with several external groups in other ventures. One is the Yale-New Haven Hospital, a very significant commitment of time and effort on the part of University administrative personnel. Another is the Brookhaven National Laboratory where selected Yale faculty serve on the governing board along with their counterparts from the other members of Associated Universities Inc. The time commitment in this case is not large. The Research Park commitment would be estimated to fall somewhere between these two examples.

The daily management of the Park will involve a Director and separate staff. In addition to its policy role as a member of the Board, Yale will be expected to direct attention to University-owned property in the immediate vicinity of the Research Park for the

potential rehabilitation. This does not involve any new directions for the University for an examination of those properties has been underway for some time. However, since the success of the Park does hinge on general neighborhood improvement, the schedule for property development within the Yale owned area may be accelerated.

A component of the development of the Research Park will involve job training for residents of New Haven, Yale may be expected to participate with the City and Olin in programs which could provide the training necessary for local residents to find work in the Park. It has already been made clear to the City and Olin that Yale's expertise does not lie in the area of job training, but certainly we would be asked to participate in some appropriate fashion. The University should indeed help as it can in improving and expanding the local Technical College and other training opportunities especially in advanced technical areas.

A final problem is marketing the Park. The Office of Cooperative Research can be expected to be the focus of the University effort in this area, and of course it will use Yale's contacts with alumni and business organizations as well as knowledge of faculty research interests in discussions with potential tenants.

Most of the areas of activity discussed above will be carried on by the University with or without formal participation in the Park. The advantages of participation seem to vastly outweigh the increment of additional effort that such participation implies.

VI. FUTURE COMMITTEE STRUCTURE

We suggest that the present Research Development Committee and the present Committee on Patents be terminated. We recommend that a single Committee on Cooperative Research, Patents and Licensing be set up as a standing committee.

The Committee on Cooperative Research, Patents and Licensing would report directly to the Provost and would be charged with recommending policy and procedures for all aspects of the operation of the Office of Cooperative Research. In addition, it would meet regularly with the Director of the Office to offer advice and to assist him, especially in his interaction with the faculty.

In each department that has, or expects to have, a significant level of interaction with industry, it would be useful to have one or two faculty members charged with keeping an eye out for potentially useful products or processes and encouraging their colleagues to report them to the Office when appropriate. This function is one that is part of the mandate of the Office, but it seems unlikely, in the early years at least, that the Director can do this himself without help. Further, clear and constant evidence of faculty interest will in itself be useful. The faculty involved in this process should themselves have active industrial connections and some of them would be logical appointees to the advisory committee.

As a standing Committee the appointments should rotate and overlap, perhaps a three-year stint with about one-third of the Committee to be replaced each year when practical. It would probably be well to restrict the number to no more than nine, and to seek members who would willingly put in the considerable time and effort that will be required. No other administrative demands on their time should be made. While faculty, distributed among those with and without industrial contacts, should represent a clear majority of the members, the Committee should include relevant members of the University administration.

While specifically engaged with all aspects of the industrial interaction, the Committee may find an overlap with the interests and concerns of the Committee on Sponsored Research and the Committee on the Yale Liaison Program. Tight coordination should be maintained between these groups to ensure the appearance, and hopefully the fact, of a smooth and efficient University organization, one which responds quickly and effectively to inquiries from both within and outside of Yale.

NATIONAL COMMISSION ON RESEARCH

Industry and the Universities: Developing Cooperative Research Relationships in the National Interest

Executive Summary

The theme of this report holds that improved university-industry cooperative research can produce significant benefits for the nation. It is in the government's interest to facilitate the relationship. Difficulties arise because of the very different character of the institutions and the responsibilities of the participants.

The Commission

The National Commission on Research was formed in late 1978 as an independent body. It was sponsored by interested organizations and supported principally by private foundations. The Commission was charged to study the relationship between the government and the research universities, to determine the nature and origins of the problems afflicting the relationship, and to recommend ways to solve these problems. Additional information on the origins and purposes of the Commission is contained in the Foreword (p. ix).

University-Industry Cooperative Research

Universities and technologically oriented companies function in different worlds. Yet there are many societal needs with dimensions exceeding the capabilities or scope of either universities or industry. The Commission recommends in this document that it is time to explore new ways for these two segments of society to produce synergistic results through programs of cooperative research.

The Introduction (p. 1) presents the opportunities which can develop from cooperative research relationships, while noting the very different roles of each of the participants. The section on background and history of the relationship between universities and industry (p. 3) begins with a discussion of the changing roles and objectives of the participants, placing research in the context of the innovation process. Trends in the support and performance of basic research between the 1950s and the present are displayed and summarized. These exhibit the increased role of government and the shift of expenditures by industry from basic research to applied research and development, although the level of funding for basic research by industry has risen in absolute terms. The consequences of lack of research cooperation between universities and industry are inefficient and unproductive dissemination of research results, and a lack of feedback from industry to universities concerning societal problems to the solution of which basic research could make relevant contributions. The relationship between universities, industry, and government is defined in the next section (p. 13) by first stating the fundamental principles which the Commission believes guides their actions; the benefits and hazards to each participant arising from the university-industry cooperative research relationship; and finally the roles and responsibilities of each participant requisite for the success of cooperative research programs. Selected alternatives for university-industry research relationships, including recent new initiatives, are described in the next section (p. 19). This section concludes with a discussion of government financial incentives for industrial support of university research.

Conclusions

The Commission reviewed the state of research and innovation in the United States. It also considered the variety of needs and philosophies that guide the actions of universities, industry, and the government. In light

of these factors, the Commission concludes that university-industry cooperative research relationships are beneficial and should be encouraged. More specifically, this report offers the following conclusions:

1. The ultimate result of any form of university-industry research relationship must be better products and services useful to the public.
2. Universities house the greater volume of basic research activity and are likely to continue to do so.
3. Research relationships between industry and universities can strengthen the innovation process and improve the vigor of research within the universities.
4. A close working relationship between the university researcher and the industrial counterpart is an imperative for a strong university-industry cooperative research program.
5. University-industry research relationships can contribute significantly to university research and instructional resources.
6. Equitable financial rewards should accrue to industry and to universities from explicit research relationships.
7. Hazards to university academic freedom from university-industry research relationships are manageable.
8. Universities, in seeking opportunities for cooperative research with industry, must exercise care to avoid subversion of proper university purposes.
9. Government can encourage and support the university-industry research relationship by becoming a facilitator rather than an ongoing participant in direction or management.
10. The less basic the research, the more difficult becomes the determination of whether the use of public funds for university-industry research relationships is proper.
11. The public must be informed of the nature and rationale of specific university-industry research relationships.
12. Misunderstanding and mistrust exist among members of industry, university students and faculty, and the general public, impeding cooperative research relationships between industry and universities. A new mechanism for discussion and resolution of the issues is needed.

Recommendations

An explanation of each recommendation is contained in the full report (p. 29). Recommendation 1 defines the character of the cooperative research relationship and is directed to all the participants. Recommendation 2 is directed at industry and suggests a mechanism for companies with common research interests. Recommendations 3 through 5 are directed to the Federal government and are mechanisms for facilitating the development of cooperative research relationships. Recommendation 6 deals with basic research relevant to regulatory policy. Recommendation 7 is directed to universities and outlines structural features which must be developed for administration of cooperative research relationships. Recommendations 8 and 9 are directed to both universities and industry and focus on public understanding of the cooperative research relationship.

1. The Commission recommends that research universities and industry explore effective cooperative research relationships which:
 - a. Are designed around important scientific areas of mutual interest, individually tailored to the characteristics of each participant—emphasizing investigator-to-investigator interaction;
 - b. Possess clearly stated objectives that preserve each partner's purposes and policies, recognizing that the often subtle differences fundamental to each partner must be understood and respected;
 - c. Allow the individual researchers from both universities and industry to determine the specific choice of subjects to be investigated. Permit each partner's participants to share in any phase of the projects appropriate to their skills;
 - d. Provide for financial reward to industry and to the university for assuming the risks of bringing highly uncertain scientific and technological programs to fruition and usefulness;
 - e. Provide opportunities for demonstrating research performance and ethical qualities that will develop mutual respect for doing good science; and
 - f. Develop a commitment for long-range support of research recognizing that meaningful research results are rarely achieved in short periods of time.
2. The Commission recommends that companies within a sector of industry review their research needs and explore the possibility of combining their resources for the support of a coordinated program of cooperative research with universities.

3. The Commission recommends that the Federal government encourage the application of research results to product development by permitting universities to retain title to inventions developed under federally supported research.
4. The Commission recommends that the Federal government provide financial incentives to initiate and maintain closer research ties between industry and universities. Tax policy provides an effective vehicle for such incentives.
5. The Commission recommends continued direct university-industry cooperative research relationships based on models which have proven effective. One such example is the National Science Foundation Industrial-University Cooperative Research Project Program.
6. The Commission recommends that university researchers be encouraged to contribute to the research knowledge base required for regulatory policy, particularly in the biological/environmental area.
7. The Commission recommends that universities examine their administrative structures and policies relevant to cooperative research arrangements with industry. Such research arrangements should facilitate cooperation, while protecting the academic research environment. Universities also should examine their patent policies and be sure they have staff capable of identifying and pursuing patent opportunities.
8. The Commission recommends that universities and industry take steps toward removing the misunderstanding and mistrust between them.
9. The Commission recommends that universities and industry inform the public of the rationale for their participation in cooperative research programs. They must make public the developing relationships and the outcome of cooperative research programs.

TABLE 3

	Benefits of the Cooperative Research Relationship	Hazards of the Cooperative Research Relationship	Roles and Responsibilities of the Partners
Universities	<ol style="list-style-type: none"> 1. Acquaintance with the marketplace and innovation process 2. Access to additional technical and physical resources 3. Enrichment of the curriculum 4. Income from patent licenses 5. Additional funding sources for research 6. Less paperwork and administrative burdens compared to direct government funding 7. Enhanced public credibility for service to society 	<ol style="list-style-type: none"> 1. Inhibition of unfettered choice of research direction 2. Temptation for more applied and development programs 3. Suspicion of use of university resources for private benefit 4. Polarization of opinion of special interest groups against universities 	<ol style="list-style-type: none"> 1. Protect the academic environment 2. Development of cooperative research framework 3. Insure industrial contributions as part of relationship 4. Inform university community of need and character of proprietary protections 5. Provide legal and policy guidance to participating faculty and students
Industry	<ol style="list-style-type: none"> 1. Acquaint research students with industrial research environment 2. Influence future research directions 3. Source of new skills and techniques for research 4. Experiment more efficiently with new directions in research 5. Increase access to peer review 6. Generation of excitement and enthusiasm 7. Enhancement of public credibility 	<ol style="list-style-type: none"> 1. Loss of some control over a proprietary position 2. Lack of relevance of university research to industrial problems 3. Suspicion of use of university resources for private benefit 	<ol style="list-style-type: none"> 1. Provision of goods and services to meet public needs 2. Develop mechanisms for transfer of research into the innovation process 3. Commitment to develop research ideas, sharing benefits with university 4. Provision of long-term research support 5. Provision of access to industry equipment and processes for participating university research personnel
Government (Public Interest)	<ol style="list-style-type: none"> 1. Improved innovation leads to long-term stable growth of the economy 2. More efficient flow of research knowledge into industry 3. Improvement of the science base for regulation 	<ol style="list-style-type: none"> 1. Potential for monopolistic action or restraint of trade 2. Co-mingling of public funds for research with privately supported programs 	<ol style="list-style-type: none"> 1. Lessen barriers and provide incentives for university-industry cooperative research 2. Support studies of potential problems in the relationship, and develop models 3. Support cooperative research where public payoff is high 4. Develop long-term perspective for cooperative research programs 5. Provision of financial incentives for industry support of research in universities

APPENDIX 2

YALE UNIVERSITY PATENT POLICY

Present Policy Approved by Yale
Corporation May 19, 1974

Recommended Changes

1. Encouragement of Patents. In the course of teaching, research, and other intellectual and administrative activity by faculty, staff, fellows, students, and others in the University community, discoveries or inventions both patentable and practical sometimes occur. Encouragement of such inventions in appropriate ways is both supportive of the public interest and consistent with the advancement of knowledge for its own sake as the primary purpose of teaching and research in a university. The University Patent Policy states the procedure to be followed in the administration of inventions which result from teaching, research, and other intellectual activity performed under University auspices as further defined in paragraph 6.

2. Purpose of Patent Policy. The purpose of this University Patent Policy is to help assure in the public interest that the patentability (or other means of exploitation) and practicality of inventions will be evaluated by qualified persons, and that the income from inventions will be used to support further research or other desirable University activities and to provide remuneration to the inventor or inventors (hereinafter "The Inventor") as long as the invention is productive of royalties.

3. Procedure as to Inventions. The University has established a Committee on Patents appointed from members of the faculty and administration. The function of the Committee is to advise the University on matters of patent policy and administration. All inventions of the kind referred to in paragraph 1 shall be reported to the Treasurer, ordinarily through the Director, Grant and Contract Administration. The

1. Encouragement of Patents.

..., and other individuals in

2. Purpose of Patent Policy.

No change.

3. Procedure as to Inventions. The University has established a Committee on Cooperative Research, Patents and Licensing appointed from members of the faculty and administration. One function of the Committee is to advise the University on matters of patent policy and administration.

a) Patent Applications. All inventions of the kind referred to in paragraph

Present Policy

Treasurer shall refer them to Research Corporation or make other arrangements for evaluation of them in accordance with this policy. Research Corporation is a non-profit organization which distributes all its net income as grants-in-aid of research to colleges, universities, and scientific institutions. It is qualified to process patent applications and license patented inventions, and does not charge for its services if the invention does not produce income. The University has made an agreement with Research Corporation in regard to these matters. The University from time to time also has arrangements with other organizations for review of inventions without charge. In addition, the inventor may propose, even though the invention is one in the patenting of the invention or the licensing of the patent shall be arranged by the inventor at the inventor's expense, and if his proposal is accepted by the University, he shall proceed in accordance with an agreement to be made between the inventor and the University providing for such patenting or licensing by the inventor. Finally, if the University decides that although patenting or licensing of an invention is not contrary to University policy the University does not wish to participate in the patenting or licensing, the University shall release to the inventor the University's interest in the invention, and the inventor shall be free to dispose of the invention as he wishes.

Recommended Changes

It shall be reported to the Provost, through the Director of the Office of Cooperative Research. The Director, with the advice of the Committee on Cooperative Research, Patents and Licensing, shall conduct an initial screening followed, when indicated, by a detailed evaluation of the invention. This may be done through an internal review panel, or by referral to one of several external organizations who manage evaluation, patent applications, and licensing in return for a fee or a share of any royalty income, or by any other appropriate mechanism. If the University decides that it does not wish, and has no legal obligation, to participate in the patenting or licensing, the University may release to the inventor the University's interest in the invention, and the inventor shall be free to dispose of the invention as he wishes.

b) Licensing Agreements.

i) For a product or process that has been developed, the University will seek to enter into appropriate licensing arrangements. In those instances where extensive development costs by the licensee will be incurred prior to marketing the invention the University may negotiate an exclusive license for a limited term. Such action will only be taken when there is clear evidence that this is the most effective route for arranging public access to the benefits of the invention. The license will contain appropriate protection to insure against failure of the licensee to carry out effective development and marketing within a specified time period.

ii) In research grants or contracts sponsored by industrial companies there will be a section covering patents on future inventions, if any, as in all government grants. When deemed appropriate, the sponsor may be granted the right to have each identified invention developed during the term of the grant considered under the policies outlined in (i) above.

Present Policy4. Division of Royalties.

a) When the Services of Research Corporation Are Employed by the University. Under the agreement between the University and Research Corporation the latter pays to the University 57-1/2 percent of the gross royalties less one-half of any special expenses (for litigation in regard to the patent) and retains the balance from which Research Corporation pays the ordinary and necessary expenses of patenting and licensing and the other half of special expenses. The University pays from its share its expenses and remits to the inventor one-half of the net income received by the University.

b) When the Services of Another Organization Are Employed by the University. When the services of an organization other than Research Corporation are employed by the University, the agreement between such other organization and the University will be followed as to the University's share. In the absence of special circumstances suggesting to the University that a different division should be proposed by the University, the net income will be divided equally between the University and the inventor.

c) When the Inventor Patents the Invention. When the inventor patents the invention by agreement between him and the University, the University's and inventor's shares of the royalties shall be as provided in such agreement. In the absence of special circumstances suggesting that a different division should be proposed by the University, the University will propose that the

Recommended Changes

iii) Only upon specific authorization by the Provost will a sponsor be guaranteed an exclusive license in advance for any future inventions.

4. Division of Royalties.

a) Recovery of Direct Expenses. Royalties resulting from licensing of an invention shall be used first to defray direct expenses incurred by the University and/or the inventor in applying for and obtaining a patent and developing and negotiating a licensing agreement. Expenses for this purpose will include fees paid to outside legal, consulting and licensing organizations and any out-of-pocket costs incurred by the University and/or the inventor(s). The fees paid to external individuals or organizations for such services may be of fixed dollar amount or may be in the form of an agreed-upon fraction of the gross royalty income, if any.

b) Net Income. After recovery of expenses by the University and/or the inventor, remaining royalties will be designated net income.

c) Distribution of Net Income. The net income as defined above shall be divided equally between the inventor and the University.

As used in this document, the term inventor may frequently represent several individuals. These individuals will be expected to agree among themselves on the fractional distribution of the "inventor" share of any royalties.

Present Policy

net income shall be divided equally between the University and the inventor.

d) Over-riding Agreements with Third Parties. The foregoing provisions of this paragraph 4 and the rest of this University Patent Policy are subject to the terms of applicable grants and contracts with third parties. See paragraph 8.

5. University's Share to be Used for Research. The share retained by the University of the income of an invention shall ordinarily be used by the University to pay the direct and indirect expenses of academic research as determined by the University. Before recommending to the Corporation the particular academic research to be supported the Provost shall, in recognition of the role of the inventor and further to encourage invention, consult with the inventor and the inventor's School, department, section, or other relevant subdivisions of the University concerning the research to be supported.

6. When an Invention Will Not Ordinarily Be Deemed to Have Resulted Under University Auspices. An invention will ordinarily not be deemed to have resulted from teaching, research, or other intellectual activity under University auspices unless

Recommended Changes

This agreement will be in writing, signed by all the individuals involved, and deposited for the record in the Office of Cooperative Research.

d) Over-riding Agreements with Third Parties.

No change.

5. Use of the University Share of Net Income. An amount not to exceed 50% of the University's share of net income will be used as a credit against the operating expenses of the Office of Cooperative Research. Expenses for this purpose will include personnel and office costs and expenses incurred by the University in obtaining patents and/or license agreements on inventions which did not result in royalties sufficient to recover these expenses. The expenses of the Office and their allocation against the University's share of net income on individual, income-producing, inventions will be reviewed annually by the Committee on Cooperative Research, Patents and Licensing to ensure equitable sharing of the costs of the Office in proportion to its contribution to developing the invention.

The residue of the University's share of net income will be used in support of research. Before allocating the funds, the Provost shall, in recognition of the role of the inventor and further to encourage invention, consult with the inventor and the inventor's School, department, section, or other relevant subdivisions of the University concerning the research to be supported.

6. When an Invention Will Not Ordinarily Be Deemed to Have Resulted Under University Auspices.

Present Policy

developed in the course of research supported by funds or by the use of facilities administered by the University, including funds and facilities received under gifts, grants and contracts for research as well as University general funds, even though the invention may have been intellectually conceived in the course of such research. The payment of salary or scholarship or fellowship awards will not alone for this purpose be deemed support by University funds. In case of doubt as to whether an invention occurred under University auspices the invention should be reported for evaluation by the University with the advice of the Committee on Patents.

7. Inventions in Which the University Has No Interest. The University does not claim an interest in inventions resulting from research not conducted under University auspices. The inventor may, however, if he wishes, submit his invention to the University under this policy. In such cases, the division of income between the inventor and the University shall be determined by agreement of the inventor and the University. All persons associated with the University are free to seek the advice and assistance of the Committee on Patents which shall seek to make available the advice of Research Corporation or another for that purpose.

8. When Arrangements With Outside Organizations Over-ride This Policy. The terms of proposed gifts and grants from, or contracts with, outside organizations or agencies, respecting rights and compensation therefor as to patents developed as a result of research conducted under such gifts, grants or contracts, or with facilities provided by any such outside organization or agency, must be submitted to the ~~Treasurer~~ for review by the University with the advice of the

Recommended Changes

... Cooperative Research, Patents and Licensing.

7. Inventions in Which the University Has No Interest. The University does not claim an interest in inventions resulting from research not conducted under University auspices. The inventor may, however, if he wishes, submit his invention to the University under this policy. In such cases, the division of income between the inventor and the University shall be determined by agreement of the inventor and the University. In the absence of circumstances which warrant a different share, the University's share will be 25% and the inventor's share 75%. All persons associated with the University are free to seek the advice and assistance of the Committee on Cooperative Research, Patents and Licensing.

8. When Arrangements with Outside Organizations Over-ride This Policy.

Provost

Present Policy

Committee on Patents. If approved by the University they are binding upon all members of the faculty, staff, and employees of the University conducting such research or utilizing such facilities, and will supercede the provisions of this policy to the extent they are inconsistent therewith. Some U.S. Government grants and contracts do not permit an interest for the inventor as large as that mentioned in paragraph 4. However, an inventor should not automatically be discouraged by the existence of an overriding arrangement with an outside source since it is frequently possible to arrange releases. Neither should the inventor conclude that notice of an invention to a granting agency will necessarily delay or obstruct publication of his research.

9. Revocation or Amendment. This patent policy is subject to revocation or amendment by the Corporation at any time. In case of doubt as to the interpretation of this patent policy the same will be interpreted by the Corporation after receiving the advice of the Committee on Patents. This patent policy is effective as to all payments received on or after July 1, 1974.

Recommended Changes

Cooperative Research, Patents and Licensing.

9. Revocation or Amendment.

Cooperative Research, Patents and Licensing.
1981.

APPENDIX 3

FACULTY HANDBOOK - February 1981

RECOMMENDED CHANGES

SECTION XIII. (pages 99 through 107)

OTHER UNIVERSITY POLICIES AFFECTING FACULTY EMPLOYMENT

- A. (No change.)
- B. Sponsored Research
- C. Outside Interests and Employment, Including Consulting Practices
- D. Conflict of Interest Situations
- E. (No change.)
- F. (No change.)
- G. Patent Policy
- H. (No change.)
- I. (No change.)
- J. (No change.)
- K. (No change.)
- L. (No change.)

* * * * *

Present Policy from Faculty Handbook
dated February 1981

Recommended Changes

B. Sponsored Research

Research and publication, together with success in teaching, are expected of persons holding faculty appointments. University policy is to encourage and assist research, and to recognize that it is essential to the training of students and to the growth of the individual as well as to the University. To this end, cooperation is given where an effort is made to secure appropriate research support from a non-University source. The University will sponsor and engage only in teaching and research activities that are compatible with its chosen range of activities and that can be conducted within the resources available at the standard of excellence it has set for itself.

1. Policy.

Individuals seeking outside support for projects for which the University assumes sponsorship, or which involve the commitment of University resources (space, facilities, or funds), should observe the following principles.

a. The University will normally sponsor proposals only when the investigator holds an appointment as instructor, assistant professor, associate professor, or professor. Exceptions require the approval of the appropriate dean.

b. The University's firm policy is not to sponsor secret or classified research projects. The policy rests on two closely related judgments: that one part of the University's essential purpose, to impart knowledge, is clearly restricted when free discussion and open publication are prohibited;

B. Sponsored Research

1. General Principles.

Research and publication, together with success in teaching, are expected of persons holding faculty appointments. University policy is to encourage and assist research that is essential to the training of students and to the growth of the individual as well as the University. To this end, cooperation is given where an effort is made to secure appropriate research support from a non-University source. The University will sponsor and engage only in teaching and research activities that are compatible with its chosen range of activities and that can be conducted within the resources available to it at the standard of excellence it has set for itself. Individuals seeking outside support for projects for which the University assumes sponsorship, or which involve the commitment of University resources (space, facilities, or funds) are required to observe the following principles.

a. (No change.)

b. (No change.)

Present Policy

that the other part of the University's purpose, to enlarge man's store of knowledge, also depends on free discussion and criticism of results of research by the scholar's peers and is inhibited along with the professional growth and standing of the individual when free dissemination is prohibited.

c. Concern for an assured right to publish implies a presumption that any instrument of support which restricts that right, or which imposes a requirement of manuscript approval prior to publication, is undesirable. Support contingent on such restrictions will be accepted only after specific approval by the dean of the school and the Provost.

d. Yale University's General Institutional Assurance on the Protection of Human Subjects, drafted in accordance with federal guidelines, sets forth the policy and procedures for review and approval of projects that involve the use of human beings as subjects. It is University policy that any research project involving the use of human subjects must be approved by the appropriate internal review committee before any activity using humans begins. It is the responsibility of each principal investigator or faculty advisor to submit the required information to the review committee. Sponsored research projects must usually be approved before the proposal is transmitted. All research, whether or not sponsored by outside agencies must be approved before the activity begins.

Copies of the General Institutional Assurance, committee review forms, and further information may be obtained at the Office of Grant and Contract Administration.

e. The University has developed guidelines and procedures for the handling of radioactive materials, carcinogenic chemicals, potentially hazardous organisms and biological materials, and

Recommended Changes

c. (No change.)

d. (No change.)

e. (No change.)

Present Policy

for other aspects of occupational safety. These guidelines, and the safety policies of organizations that fund research, are subject to periodic review and revision. Designated faculty committees are charged with the responsibility for formulating Yale guidelines and recommending enforcement procedures. These committees are assisted in the execution of their responsibilities by the Division of Occupational and Environmental Health of the University Health Services. It is the responsibility of each investigator using such procedures or materials to be familiar with the guidelines and to comply with them. Inquiries may be directed to the Office of the Provost.

Recommended Changes

f. It is the obligation of the faculty member to notify agencies currently funding his or her research concerning other research, using the same space or facilities, which is funded by an industrial concern(s).

2. Additional Considerations for Research Sponsored by Industrial Companies.

In addition to research sponsored with government or foundation support, the University will also seek industrial research support. When an agreement is formulated in which University facilities, staff or students are used in the development of new knowledge under the financial sponsorship of an industrial concern, the following guidelines, in addition to those specified above for sponsored research in general, will pertain:

a. Publication of research results shall not be restricted beyond reasonably brief, pre-agreed, and specified time periods. Delay in communication of research is of particular concern as it may affect the professional development of students and postdoctoral fellows.

b. Students, postdoctoral fellows and/or staff are not to take part in such research without their express knowledge

Present PolicyRecommended Changes2. Procedures.

a. All applications and proposals seeking public or private support for research or teaching activities must be transmitted through the department chairman (in the Faculty of Arts and Sciences and in the School of Medicine) or through the dean (in all other professional schools) to the Office of Grant and Contract Administration either in the School of Medicine or in the Office of the Provost. Two weeks should be allowed for administrative review and transmittal.

b. In all cases where private support is contemplated, initial discussion with the Office of Corporate and Foundation Relations is required.

c. In those applications where government support will be extended beyond individual projects--e.g. building construction or renovation, department development, teaching programs involving New Haven agencies or compensatory education--initial consultation with the Office of Grant and Contract Administration is required.

d. When support is sought for individual research projects, faculty members may make contact and hold initial discussions with prospective government sources without prior administrative discussions.

and consent. When they are so involved, they must have full rights, subject to paragraph a., to discuss and publish their research in accordance with their academic and professional development needs.

c. When groups of faculty members within or between departments enter into an overall agreement with industry, it must be clear that individual faculty members may withdraw at any time. Their subsequent research activities in the University should not be constrained by these prior associations.

3. Procedures.

a. (No change.)

b. Delete paragraph.

c. (No change.)

d. (No change.)

Present Policy

e. All applications and proposals must state the full cost of the project and proposed sources of support. Faculty members are advised to allow sufficient time for the often lengthy process of review and recommendation.

f. Because of a severe space shortage within the University, the Provost will not approve proposals unless it is clear that appropriate space will be available. Faculty members proposing projects requiring additional space should consult with their department chairman or school dean and the Office of Facilities Planning about the availability of space before initiating the proposal.

g. Members of the Faculty of Arts and Sciences may not propose a time commitment of more than fifty percent of their academic year for the conduct of research without the appropriate dean's written approval. Exceptional cases, such as those of an individual who will be on leave, should first be discussed with the Director of Grant and Contract Administration. In the professional schools, faculty should consult their dean for policy guidance specific to that school.

h. Special considerations arise and special procedures are necessary when funds are sought that may involve Yale-New Haven community relations. Any grant proposal involving local institutions or residents of New Haven (as participants or as collaborators) should be brought to the attention of the Secretary of the University, who has overall responsibility for relations between Yale and the New Haven community.

i. Particular attention is directed to the requirement that actions proposing to change the duration, award amount, or conditions of support require the same approvals within the University as an original proposal or award.

Recommended Changes

e. (No change.)

f. (No change.)

g. (No change.)

h. (No change.)

i. (No change.)

Present PolicyC. Outside Interests and Employment,
Including Consulting Practices.1. Outside Academic Employment.

Employment during the academic year at other educational institutions is prohibited by the Corporation unless specifically approved by the Provost. Exceptions are made only for emergency situations, which must be stated in writing to the Yale Provost by the Provost or Dean of Faculties of the institution requesting the services of a Yale faculty member. In most cases, Yale faculty members will not be permitted to receive extra compensation for such teaching at another institution though they may receive a reduced schedule at Yale. If released time is arranged, Yale will be compensated by the other institution. If additional compensation is to be granted in cases where a reduced schedule is not possible, specific approval by the Provost is required.

2. Nonacademic Employment.

In the case of forms of employment of a nonacademic nature (such as services in an advisory capacity to a business concern or as a consultant to a government agency, a foundation, or another organization), the University's policy, stated in terms of general principles, is that the individual's services both to the University and to outside organizations should be governed by the individual's obligation to further the University's essential purpose, "to preserve and enlarge man's store of knowledge and to impart it." Certain considerations regarding outside employment derive from this general principle. The factor determining whether this kind of employment is permissible is whether the activity in question will enhance the faculty member's professional competence and hence better equip that individual to serve the University.

Recommended ChangesC. Outside Interests and Employment,
Including Consulting Practices.1. Outside Academic Employment.

(No change.)

2. Nonacademic Employment.

(No change in this paragraph.)

Present Policy

The individual's overriding obligation to the University also determines the amount of outside employment permitted. This obligation is not fully discharged merely by meeting classes; it requires individuals to be available to their students outside the classroom, to carry their share of committee work, to keep their own research programs in constant progress. Obviously, any commitment that involves frequent or prolonged absence from the University is in conflict with the individual's primary duty as a member of the faculty.

In the case of persons on phased retirement, the University will consider any employment acceptable which does not involve a conflict of interest and does not interfere with the faculty member's obligation to the University.

Except for activities clearly of public benefit (e.g., occasional site visits or evaluations at the request of a government agency, advice to foundations, work for professional associations, or community services) members of the faculty should send a written request to the relevant department chairman (within the Faculty of Arts and Sciences) or to the dean of the appropriate school before undertaking outside employment during the academic year. Requests for outside consulting activities that are consistent with the principles outlined above and which do not require on the average more than one day a week in any semester will normally be approved. During months in which faculty members are receiving off-term compensation, consulting should not exceed one day in any week. Circumstances judged to merit exceptional treatment should be referred in writing to the Office of the Provost.

Recommended Changes

(No change in this paragraph.)

(No change in this paragraph.)

Activities clearly of public benefit (e.g., occasional site visits or evaluations at the request of a government agency, advice to foundations, work for professional associations, or community services) should be considered an important component of faculty responsibility. Other activities of a nonacademic nature that are consistent with the individual's overriding obligation to the University are normally acceptable. On average no more than one day per week in term should be spent on outside activities. In months during which a faculty member is receiving off-term compensation administered by the University, outside employment should not exceed one day per week. Circumstances judged to merit exceptional treatment should be referred in writing to the Office of the Provost.

Faculty members can be expected, upon request, to report on their outside professional activities in writing to their department chairman, to the Dean of the appropriate faculty or school, or to the Provost.

The Office of Cooperative Research is available to help faculty members review individual consulting agreements

Present PolicyRecommended Changes

with outside organizations, especially to assist the individual in the negotiation of financial and patent rights, and to comply with requirements of the government or private agencies funding their research.

3. Adjunct or Part-Time Appointments.

It is possible that faculty will become so involved in outside research-related activities for such sustained periods that they are no longer able to meet adequately their overriding obligation to the University. Department chairmen or deans should consider, in conjunction with the Provost, the following options for individual faculty members:

a. An unpaid leave of absence.

b. Conversion of present appointment to adjunct status if the remaining commitment to the University merits such an appointment. (Note that such a change would imply that return to the ladder rank would not be possible without the availability of a position and full implementation of normal appointment procedures.

c. Conversion of present appointment to a part-time appointment, for a period not to exceed 2 years. At the end of this period the individual, by agreement with the department: will resume the original full-time appointment; will convert to adjunct status; or will resign.

These options fall within the categories and procedures described in earlier sections for Faculty Appointments and Ranks.

Departments may also wish to consider adjunct appointments for outside persons from industry with appropriate education and experience. Such appointments will follow established University policy for review and approval in the Faculty of Arts and Sciences.

Present PolicyD. Conflict of Interest Situations.

A special kind of problem may arise when an individual has a consulting agreement or other substantial personal interest in an organization which either manufactures equipment that is purchased for use in research and/or instruction at Yale or is otherwise active in the field of such research.

Responsibility for the propriety of arrangements in which multiple and possibly conflicting interests exists rests in the first instance with the individual. For the protection of all concerned, members of the faculty are expected to provide full information to, and obtain the approval of, the appropriate dean or the Provost for any arrangement in which a conflict of interest is implicit or potential. Requests for clarification of specific situations, including consultation with contracting officers of the government when necessary, should be referred to the Office of Grant and Contract Administration.

Recommended ChangesD. Conflict of Interest Situations.1. General Comments.

A special kind of problem may arise when an individual has a consulting or employment agreement, financial interest or board membership in an organization which does business with the University. Of special concern is the situation in which a faculty member has an ownership position in such a company.

(No change, except...)

(add; or the Office of Cooperative Research, as appropriate.)

2. Receipt of Equity.

It may be appropriate in some cases for a faculty member and/or the University to receive shares of equity in a company using the results of University-supported research. Special care must be used, however, to ensure no distortion of the faculty member's overriding obligation to the University or of the primary direction of the University's research activities.

The faculty member therefore will be expected to report in writing to the Provost, chairman or dean all instances in which payment of equity will be involved. Each case will be reviewed by the Committee on Cooperative Research, Patents and Licensing.

Present PolicyRecommended Changes

* * * * *

G. Patent Policy.

The University policy on patents is intended to ensure that the patentability and practicality of inventions be evaluated by qualified persons, and that such income as accrues to the University from inventions be used to support research. The inventor will receive remuneration as long as the inventions produce royalties.

All inventions made under University auspices must be reported to the Committee on Patents through the Director of Grant and Contract Administration. The patent policy is administered by the University Committee on Patents; the Director of Grant and Contract Administration provides liaison. A full statement of University policy is available from the Office of the Vice-President for Finance and Administration. Details of the policy are available in the offices of deans and chairmen, or in the Office of Grant and Contract Administration.

G. Policy on Patents and Licensing.1. General Comments.

The University seeks to encourage faculty members to consider potential development of their research work so that the basic research conducted at the University can be carried forward for the benefit of mankind. A private organization will generally be best equipped to develop, employ, and distribute the results of such research.

Products or processes may be patentable or may be licensed for use more appropriately without patenting. Any potentially useful invention should be reported to the Committee on Cooperative Research, Patents and Licensing through the Office of the Director of Cooperative Research. The Committee will arrange for evaluation of the invention, and, where indicated, for assistance in preparing a patent disclosure and/or licensing agreement. It is in the interests of both the University and the inventor(s) that the importance of basic research findings in a successful commercial application be recognized in the form of royalties or fees derived from such applications. A full statement of the University policy on patents and licensing is available from the offices of the Provost, deans and chairmen, from the Office of Grant and Contract Administration, or from the Office of Cooperative Research.

2. Incentives.

In general, income from the licensing of the results of research conducted on University premises by University personnel will be collected and divided as follows.

Royalties shall be used first to defray expenses incurred by the University

Present PolicyRecommended Changes

and/or the inventor in applying for and obtaining a patent and in developing and negotiating a licensing agreement. Expenses for this purpose will include fees paid to outside legal, consulting and licensing organizations and any out-of-pocket costs incurred by the University and/or the inventor(s). After recovery of expenses by the University and/or the inventor, remaining royalties will be designated net income. This net income will be divided equally between the inventor(s) and the University.

The term inventor may frequently represent several individuals. Before a license is issued, these individuals will be expected to agree among themselves on the fractional distribution of the "inventor" share of any royalties. This agreement will be in writing, signed by all the individuals involved, and deposited for the record in the Office of Cooperative Research.

The University portion of the net income will be used to support the Office of Cooperative Research and to support academic research at the University. Before recommending to the Corporation the specific use of the funds, the Provost will, in recognition of the individual faculty member(s) involved and further to encourage such research activities, consult with the inventor(s) and his or her school, department, section or other relevant subdivision of the University concerning the research to be supported.
