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MR. GOODWIN: How do you reconcile that with the situation of the employee of a corporation who doesn't get any data rights to make it big as a result of being employed on a research and development corporation?

DR. KAYTON: Well, this is a free country and he opted to be kept rather than to be promiscuous. And there are advantages in being kept. Some inventors genuinely function more effectively and more creatively by having a good, large, steady salary. And they are with the large corporations, and that is the 50 percent with which we have no problem.

It is the others that I am talking about.

MR. GOODWIN: Thank you.

CHAIRMAN JOHNSON: Thank you very much, Professor Kayton.

I think that concludes our session for the day.

While it is true we have heard many of these arguments before, it is still desirable to hear them again in order that we get as many possible views in order to come up with good, solid recommendations.

We will start tomorrow at 9:15 here in this building with presentations from General Electric Company.

(Whereupon, at 5:15 the hearing in the above-entitled matter adjourned to reconvene at 9:15 a.m., Wednesday, November 19, 1975.)

That completes my unprepared remarks.

CHAIRMAN JOHNSON: Dr. Kayton, you have certainly measured up to your past performance.

Joking aside, what you have to say is very clear. Let me ask you if you have considered the alternative patent policy set forth in the report of the Commission on Government Procurement. Recognizing that ERDA's patent policy is based on statute and the regulations have to issue to carry out the statute, the burden of your remarks is that ERDA should consider recommending changing the statute.

One possible suggested change is this alternative number two. Are you aware of this?

DR. KAYTON: I don't know the specifics of alternative number two; I am sorry. But I would like to say one thing about what you have just said. A part of my comments are clearly antititle policy. Waiver provisions and title policy just mean that everybody has to pay a lot of money for no good reason at the front end.

However, the rest of my comments had to do with compulsory licensing which probably at this stage of the game is a greater danger than anything else.

That question number three to be considered by the report -- I don't want to look for it -- is it desirable to have mandatory licensing to carry out ERDA's -- the way that is phrased is an outrage because the answer is yes, or no.

Both of those are totally incorrect. The answer is mandatory licensing will destroy the objective of ERDA's function.

CHAIRMAN JOHNSON: So your answer is it is not desirable?

Are there other questions?

Mr. Goodwin.

MR. GOODWIN: I am just wondering, Professor, whether you have any hard data and statistics to support your judgments as to what motivates small or large contractors.

The Court regretted having to preclude the issuance of an injunction because of the merits of the patentee, but said the question of pure water for the City of Milwaukee is paramount.

Not that the City of Milwaukee had not obtained pure water before using chemicals. They had and they could then.

Nonetheless, the Judge felt it was essential to have this improvement available. No injunction.

In a recent case in the Second Circuit, Foster versus -- I have forgotten the other party -- AMF, I suppose, the Court because of very peculiar circumstances in that case refused to grant an injunction against the infringer.

In an aggravated situation in this country, were mandatory licensing not allowed, and one of the ERDA contractors had this breakthrough and could not supply the country as needed, but nevertheless refused to grant licenses, the likelihood is very great that a Federal Judge would refuse to grant an injunction against the infringer.

And even if that Judge did grant the injunction, if this contribution was such a breakthrough and was so magnificent and embarrassed the activities of our country, we could take it by eminent domain.

Consequently, we have nothing to fear except the incredible front-end administrative burden of these regulations.

If we let the law take its course and keep the incentive to invent available to all institutions of all persuasions and interests, and look to the remedies that are available to us later on should anyone refuse to act in a socially acceptable manner, we would be so far ahead of the game than having to have all of you sit here, listen to this testimony, draft these regulations, have hearings with each contractor on waiver proposals, mandatory licensing, incredible bureaucratic front-end load and an incredible load on the contractor.

All at the front end before you even know whether anything is going to be produced.

payment of dollars for bodies in laboratories is not a sufficient justification for the allocation of their resources to ERDA's interests.

What, after all, looking at the beginning clauses, where mandatory licensing is stated -- Consider the clauses.

The achievement of ERDA's objectives would be frustrated if the government at the time of contracting did not obtain on behalf of third parties limited license rights in and to contractor proprietary data.

That is alleged.

Well, my friends, what are the objectives that you have?

The objective that you have, the reason you are sitting here, the reason the Legislature put this whole thing together, is because we are paying $12 a barrel for oil from the OPEC countries.

The objective, therefore, is to provide energy at something less than $12 a barrel.

When the OPEC countries impose an embargo, the objective is to have an alternative to oil even at $12 or more a barrel here in the United States.

This is the objective.

Now, I could imagine legislation saying that for any institution that comes up with an OPEC oil conserving invention we will pay $12 or whatever OPEC's price is, X minus a small amount delta for every barrel of oil the invention eliminates from our import requirements.

We don't have anything like that.

What we are doing here with this legislation and proposed rules is to say, "We are going to give you money because we want you to do this research."

We want to provide some incentive.

But money just provides bodies. And unless you are paying your money to an exclusive military contractor which is a straight body shop and a cost-plus

Mr. Hill, thank you very much for your appearance here today.

Our last participant today is Dr. Irving Kayton, Professor of Law at the George Washington University.

DR. KAYTON: Mr. Johnson, thank you.

I have no objection to saying something dramatically if I feel that the truth of the statement will be further promulgated.

I might point out that in the discussion that you are concerned with today two items caught my attention. One announcing the hearings and the other, the introductory clauses in the optional mandatory licensing proposal.

The notice of hearing said the objective of the ERDA Patent Policy is to provide an incentive function to stimulate commercial industrial development in energy fields and so on.

It should be over-abundantly clear to everyone here after hearing the speakers today that the people and institutions involved in energy development are not a homogeneous group.

For example, the preceding speaker's statement is most appropriate and understandable for a giant oil corporation which has to conduct research in order to stay alive.

CHAIRMAN JOHNSON: Excuse me just a minute.

Could Mr. John Wilson come forward? I have a message for him of an urgent character.

Thank you.

DR. KAYTON: The category of the previous representative naturally comes to the issue of research and development from the point of view of the functioning of his institution.

Large corporations such as his appropriately and necessarily will continue with research and development as a matter of life and death if there were no patent system whatsoever.

MR. HILL: By that, do you mean research aimed at patent protection to give us freedom to operate?

MR. RITZMANN: Yes, and to be sure you don't get blocked from being able to work in an area.

MR. HILL: We certainly try to protect the processes, procedures, in which we have a commercial interest. We will do this by attempting to continually improve these. We will be obtaining early in a development what we consider to be relatively basic patent protection. This will be followed in ensuing years with a number of, say, improvement type patents.

The idea of something as a blocking patent as such doesn't really enter our thinking particularly. If you want to look upon anything that is licensable as blocking, then certainly we would have some. But it is our feeling that wherever we have been successful in our own commercial development, then patents that relate to those items are the ones that you can successfully license to others.

The prospective licensee always likes to see first a plant in operation.

MR. RITZMAN: Standard Oil does contract with others to do research for Standard Oil, (Indiana), doesn't it?

MR. HILL: We do some work with various research institutes, that is correct.

MR. RITZMANN: How do you treat patent rights in your contracts with those interests?

MR. HILL: In instances of that sort, where we have been providing the major or exclusive funding, we will take title to the patent assets that may arise from those projects.

MR. RITZMANN: Together with background rights?

MR. HILL: There wouldn't be background rights in an instance of that sort. Work that is done, let's say, by a third party research institute on our behalf would assign the patent rights to us. But we would not take any rights in other assets of theirs, anyway.

MR. PHILIP HILL: I don't have an exact figure in mind on that, sir; but we have done extensive licensing in both areas.

The figure is probably, oh, perhaps 40 to 50 percent may be in the foreign field.

MR. JEFFERSON HILL: Fine. Thank you.

CHAIRMAN JOHNSON: Mr. Eden.

MR. EDEN: Do you license for royalties or do you simply exchange licenses with other firms?

MR. HILL: We license for royalty income primarily.

MR. EDEN: What would be the approximate income from those 100 licenses?

MR. HILL: The approximate income from those licenses, I think, falls under the category of proprietary information not trade secret, if I could amplify on one of the questions asked earlier this morning of a young lady who didn't think of that one.

CHAIRMAN JOHNSON: Dr. White.

DR. WHITE: Mr. Hill, I was interested in your favorable reaction to ERDA policy. If it isn't an unfair question, as the company is looking at the possibility of participating in fossil energy development, talking about shale or possibly coal, do you feel this will be conditioned on the waiver provisions?

If it isn't, will you sit back, or has that been formulated at all yet?

MR. HILL: We haven't gone into it too deeply; however, I think you are pretty close to the situation. The waiver provisions, guidelines for waiver, set forth a number of circumstances under which we feel that we could participate.

We also, being, as you know, deeply involved in the energy business in a number of ways, feel it is very necessary that means be found for, say, cooperation wherever possible between Government and industrial people and projects, because industry has much expertise.

A minor portion of Standard's research and development effort has been conducted under contract with various Federal agencies, although certainly most of the funding has been provided from corporate sources.

I have stated this to try to make clear that Standard and its affiliates possess extensive expertise which can be applied to the development of new energy sources. But this expertise is an asset; it is a proprietary interest whose application to new energy developments conceivably may accelerate progress toward designated goals in a variety of projects. The availability of this expertise must be subject to the presence of adequate means for protection of such proprietary interests.

Accordingly, our companies have a very real interest in the resolution of existing questions relating to patents and licensing matters in a manner that will permit and encourage the broadest application of petroleum expertise to expedite the desired development of new energy sources. With an ERDA patent policy liberal in the sense of providing flexibility, we believe that greater participation by our companies and certainly by others will result. We therefore commend the patent policy proposed by ERDA.

Gentlemen, we strongly recommend its adoption. Thank you.

CHAIRMAN JOHNSON: Thank you, Mr. Hill.

Do you have any comments with regard to the background licensing provisions that have been criticized by other speakers?

MR. HILL: It is our feeling that you have built into it provisions as I read them here that will provide enough flexibility to permit us to live with them, not extremely comfortably, but enough so.

A careful reading of your background patent provisions does indicate that, as I read it, at least. Under most circumstances a rather considerable amount of, let's say the patent rights, may be not withheld, but made available in a very limited manner. In other words, only where there is an absolute need to do so.

CHAIRMAN JOHNSON: Only in extraordinary circumstances?

Of that, we, as the inventors say, "rip off" 15 percent off the top to go for the administration of the program. Then we subtract direct patent expenses. For the last university fiscal year, there was $90,000 worth of patent expenses.

The amount remaining after that is divided into equal thirds, representing three entrepreneurial centers. Clearly, the most important one is the individual. Second is the individual's department. (Each department only gets so much money from the general fund to operate, and they have to serve as an entrepreneurial center.) Third is the general fund itself.

We have different experiences from different departments.

From the medical school, we licensed about one in three. In the basic science areas, our rate of success is much lower.

MR. JEFFERSON HILL: Thank you very much.

MR. GOODWIN: Does your university do any work for private companies?

MR. REIMERS: Very little. We do about $50 million to $60 million. Overall and of that had only about $100,000 worth of industry research. We typically don't do industry research, because we are not very good at it. We are best at basic research and usually, industry wants a product.

MR. GOODWIN: Thank you.

CHAIRMAN JOHNSON: Thank you very much, Mr. Reimers.

Our next participant -- We have two more today, and with your permission I will pursue right on to the conclusion -- is Dr. Irving Kayton, Professor of Law at George Washington University.

If he is here, he may proceed.

Is Mr. Philip Hill present? Let's proceed with you, sir.

Our next participant, then, will be Philip Hill, Director of Petroleum and Corporate Patents and Licensing, Standard Oil Company of Indiana.

with the present energy oligopoly. If required to license competitors by ERDA, even with "reasonable royalties," it would appear this hypothetical company no longer would be able to compete, absent a proprietary position. Are there actual, documented situations where the absence of mandatory licensing provisions has prevented another government agency from carrying out its program? Or is it paranoia?

The argument we heard this morning of the Corporate Accountability Research Group could have been made by advocates for oligopolies. Who else stands to benefit from the absence of patent incentives for results of government research?

Let me interject from the point of view of a university trying to license undeveloped technology, it is very difficult to license "large corporations," primarily because of the lack of entrepreneurial desire. Most of our licenses are with small companies.

Let us consider the scenario where ERDA does retain title, thus removing the invention from the inventor. The first thing that happens is nothing. Who has incentive? It has become a piece of paper, the patent application. The patent issues and gets added to the government's 26,000-plus pile. ERDA is now advertising I believe 8,000 patents for license. Was that accumulation in the public interest? Of course not.

Experience has shown that with the great majority of undeveloped inventions, if you are not well along the road to a license long before the patent issues, it's too late. Progress of technology doesn't wait. The public benefits from utilization, not from the negativism which prevents a contractor from "profiting" or, it should be noted, "losing" on an invention and also prevent its availability to the public.

CHAIRMAN JOHNSON: Thank you, Mr. Reimers.

You recognize, of course, that ERDA's patent policy is based on statute and has to proceed from statutory foundations. But I take it you are recommending that we seek modification of that statute.

MR. REIMERS: Yes, I am.

As a policy consistent with Section 9(c) of the ERDA Act, it is strongly recommended that ERDA adopt the recommendations of the University Patent Policy Ad Hoc Subcommittee of the Executive Subcommittee of the Committee on Government Patent Policy, Federal Council for Science and Technology, dated July 17, 1975, as an appropriate policy in regard to inventions deriving from government-sponsored research at universities. It is a positive policy directed to obtaining utilization of results of research and extends the tested Institutional Patent Agreement (IPA) approach pioneered by the Department of Health, Education, and Welfare, which has shown excellent results in the years it has been used.

Taking the reasonable assumption that the experience at this university can be extrapolated to other universities, the bureaucratically cumbersome petition-and-waiver process of some government agencies operates to delay, if not impede completely, the development of research results to products and processes available to the public. That the "IPA" has been superior to an after-the-fact waiver procedure (or no-waiver procedure) in achieving such development should be capable of easy verification by viewing invention utilization results of the various agencies.

Insofar as a patent policy which would work for both industry and universities, your consideration of the recommendation of the Licensing Executives Society just presented by Mr. Jacobs, is recommended. This is the result of deliberations by an LES committee including industry and university participation.

By any standard of measurement, the utilization of inventions which has been derived as a result of government-funded research has been poor. This has been particularly evident where the government has retained title to inventions of contractors, whether industry or university, on the basis of one or more negative arguments such as the following:

(1) "The government has paid for it -- The government should keep it;" (2) "if the government doesn't retain title, then the public will be forced to pay a monopolistic surcharge for an invention that their tax dollars paid for in the first place;" (3) "the contractor will be getting windfall profits if we let him keep title to his invention;" etc.

G. Intervention

All interested parties, including any agency of the U.S. Government, shall have the right to intervene in any proceeding before the Board.

MR. JACOBS: Thank you.

I will be happy to answer any questions.

CHAIRMAN JOHNSON: Thank you very much, Mr. Jacobs.

Are there any questions from members of the panel?

Mr. Goodwin of the Office of Federal Procurement Policy.

MR. GOODWIN: Mr. Jacobs, do you think companies should be prepared to negotiate a lower profit in consideration of any additional patent rights that they may obtain under contract?

MR. JACOBS: Speaking personally, I think that is not an unreasonable request. We have, in fact, in my company done just that when we negotiated contracts with the Department of Health, Education, and Welfare.

CHAIRMAN JOHNSON: Mr. Denny.

MR. DENNY: I find myself wanting to give talks, Mr. Johnson, rather than ask questions. But there were several questions, or statements made that I would like to respond to.

The concern that we will not give waivers. We have and we will.

I hope past policies of any agency will not serve as a deterrent to give us a try, particularly in regard to small businesses. If you have a contract with the Small Business community, I wish you would tell them to come try.

We have given small business waivers; we have given individual inventors waivers. If you are scared of the red tape, try the telephone.

(6) At any time after the period set for utilization by an agency has expired, the Board may require the granting of non-exclusive licenses under U. S. patents or patent applications with terms it deems appropriate on the basis of:

(a) The failure of the contractor to show cause why such license should not be granted; or,

(b) The factors contained in paragraph 5.B below.

B. Board Review of Refusal to Grant Licenses

The Board shall take into consideration, in addition to the arguments of the parties, at least the following factors in making its determination to require licensing of an invention made in performance of a government contract.

(1) Achieving the earliest practicable utilization of government-assisted inventions in commercial practice;

(2) Encouraging, through the normal incentives of the patent system, private investment in the commercial realization of government-assisted inventions;

(3) Fostering effective competition in the commercial development and exploitation of government-assisted inventions;

(4) Assuring against non-utilization of government-assisted inventions and excessive charges for use of such inventions stemming from private ownership of patents on such inventions;

(5) Balancing the relative equities of the public, the inventor and the patent owner or developer in the specific government-assisted invention, measured by the investment necessary to bring the invention to the point of commercial application. This would include the following:

(a) The relative contribution of the government and the contractor in bringing the invention to the marketplace;

(b) The mission of the program funding the contract from which the invention arose;

(c) The type of invention and the magnitude of the problem it solves;

C. Reports

The contractor shall promptly advise the agency upon issuance of any U. S. patent covering an invention to which he acquired exclusive commercial rights. During the three year period after issuance of a patent the contractor will submit, upon the agency's request reports setting forth progress made toward commercial utilization. If after three years from patent issuance utilization has not been achieved, the agency may take steps to revoke the exclusive commercial rights unless satisfactory evidence is presented that the time for utilization shall be extended.

3. CONTINUING RIGHTS

Whenever utilization has been achieved by the contractor within the time agreed upon by the agency, the exclusive commercial rights will continue in the contractor for the life of any patent(s) claiming the invention, subject to the provisions set forth in paragraphs 4 and 5 below.

CONTRACTOR LICENSING

A. [Three years after issuance of a patent claiming an invention in which a contractor has elected to acquire exclusive commercial rights] After the ends of the periods specified in paragraph 2A hereof, the contractor may be required to grant non-exclusive licenses under such patent by the Government Patent Review Board under conditions set forth in paragraph 5 below.

B. Contractor shall have the right to sublicense others on an exclusive or non-exclusive basis under any terms he deems appropriate, subject only to existing laws and the requirements of the Government Patent Review Board.

C. If the contractor permits utilization to cease, the agency may require the contractor to grant an exclusive or non-exclusive license to responsible applicants on terms that are reasonable under the circumstances.

PROPOSED POLICY FOR THE ALLOCATION OF RIGHTS TO INVENTIONS MADE UNDER GOVERNMENT R&D CONTRACTS

Original Source: Report by Task Force #1 of Study Group #6
Commission on Government Procurement
Allocation of Rights to Inventions Made in the Performance of Government Research and Development Contracts and Grants
November 11, 1971

Modification: Report of Committee on Government Relations to Intellectual Property Adopted by Board of Trustees, Licensing Executives Society (U.S.A.), Inc.
October 16, 1975

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1. POLICY

A. With the exception set forth in 5(A)(3) below, contractors shall be guaranteed at the time of contracting a first option to the exclusive commercial rights in all inventions made in performance of government-funded contracts. (The term "exclusive commercial rights" should be understood to include either title to the invention or an exclusive license thereto with the exception that as the term relates to foreign patents or patent applications it means title).

B. Any statutory provisions which are inconsistent with such guarantee or the principles of this policy shall be repealed.

C. The guarantee of exclusive commercial rights will be extended to universities and other nonprofit organizations only after government review of the adequacy of those organizations' patent management capabilities.

D. The government may later revoke such rights in a contractor after failure of the contractor to meet conditions as hereinafter provided.

E. Exclusive commercial rights in a contractor will be subject to a world-wide, royalty-free, nonexclusive license in the government for Federal Government purposes.

contractor exclusive rights recommended by the Task Force for the following reasons:

1. Practical experience by contractors with other government agencies suggests that the likelihood of a contract administrator granting a waiver will be slim. Where the "normal policy" is for ERDA to retain ownership, it will be an unusual administrator who will take the time, effort, and personal risk to study and then recommend that ERDA grant these "extra" rights to the contractor.

2. Many bidders for ERDA contracts may be inhibited from pressing their case for a waiver for fear of jeopardizing their chances to win the contract. In fact, while the regulations encourage requests for waivers as part of the contract proposal, they do not specify what the effect will be when there are two equally qualified proposals, one requesting a waiver, and the other not.

3. The need to formally request a waiver, and to provide thirteen categories of supporting evidence, will undoubtedly inhibit smaller companies from making those requests. The required boiler-plate will be easy for a large government contractor to prepare, but an impossible task for smaller companies. Once again, the small entrepreneur, who is most likely to have the courage and the determination to invest his time, effort and money in novel and difficult technology, will be denied the incentives which the patent system is supposed to provide.

As I am apparently one of the few representatives of smaller companies here today, I would like to add a few personal comments.

My company in Lexington pioneered the development of a new type membrane filtration system about ten years ago. We have built two entirely new businesses supplying these membrane systems to the medical research community and to food and pharmaceutical producers. Although we had on our staff some of the most creative membrane and ploymer chemists around in the mid-1960s when we were doing our work, we specifically refused to accept any membrane research contracts from the Office of Saline Water, which was the agency that at that time was sponsoring millions of dollars of research on desalination membranes.

We simply decided we could not afford to jeopardize our proprietary position in membrane technology even though we

the public benefit. Any private organization with such a low "success ratio" in commercializing its developments would have long since closed its doors.

While this low commercial use can be explained in part by the fact that the government does finance a high proportion of quite basic research as well as research aimed at defense or aerospace needs having inherently low potential for commercialization, these are not the only reasons.

Bringing a government invention to commercial use requires private investment; private investment is being deterred rather than encouraged by the present government patent policy. The need to encourage private investment to experiment with and to exploit new technology is especially urgent in the search for new energy sources and conversion processes. Without active participation and risk taking by the private sector, the mission of ERDA can never be accomplished.

In formulating a patent policy for ERDA, we should recognize that many scientific advances resulting from ERDA programs will still be in the embryonic stage at the conclusion of the research contract. Although ERDA may be able to finance pilot and demonstration plants for a few promising processes, the high cost of these plants dictates that 99 percent of the technology developed under ERDA contracts will never reach this stage.

What happens to those scientific advances, whether they ever have a chance to receive the next critical idea that might turn failure into success, whether they are ever seriously evaluated for use in applications other than the one originally intended -- All of this depends in large measure upon the ERDA patent policies and the degree of incentive they provide for private investment.

Our Society strongly urges that ERDA adopt as its patent policy the recommendations made in 1971 by Task Force Number 1 of Study Group Number 6 of the Commission on Government Procurement, with minor modifications. This Task Force, composed of patent counsel from government agencies and private industry (including Mr. Johnson, who is now General Counsel of ERDA), strongly urged that exclusive commercial rights in contract inventions be granted to the contractor

with industry, to pull in the risk capital that is going to be needed and to develop new technology competitive to what may already be on the market.

In many of the comments, it sounds to me like we are expecting one piece of technology to come out for solar energy, one for fossil fuels, one for nuclear. Gentlemen, the patent system is designed to develop competitive technologies. That is why I don't really worry too much about having mandatory licensing. I think the situation will take care of itself and perhaps we are creating more of a straw man than we need to.

Let me point out, also, that there are two segments in industry: those who live by doing government contract work and those who live outside of that sphere, who manufacture goods and provide services for the private sector. It is to this latter group of companies that the university must relate and transfer technology to get it used. This also is the group that, in my opinion, ERDA needs to accomplish the energy goals it set forth and that the Congress has mandated. Those are the people that we need to work with and that you need to work with.

In conclusion, we feel ERDA should have a patent policy with respect to universities with the technology transfer capability that leaves principal rights with the university.

There is equity in this, since there is no way for the university to use the nonexclusive license given to the industrial contractor. You have made good provision for that, and I think it is right. But I would point out that the university gets no advantage from that at all. I would also suggest that patent rights resting in the university is the best way to meet the goals in a manner that protects the public interest and particularly reduces administrative burden. We have been hit very strongly by that in universities in many programs, each of which are good, but the total impact is almost overwhelming. The patent area is one I feel very strongly about. We need to have a patent policy that is cohesive relative to most federal agencies that we can live with and administer without having to spend all our time reading regulations.

I would further suggest that the implementation of such a patent policy be through the mechanism of an

You have my prepared statement. The gist of that statement goes along the lines several other university representatives have made here today. It ends up asking that you consider giving principal rights of inventions arising out of ERDA funded grants and contracts at universities that have a technology transfer capability to those universities subject to certain limitations and safeguards.

Now, rather than reading that statement, I would like your permission if I might, to make some extemporaneous remarks relative to the position we have taken.

The Iowa State University Research Foundation acts as an agent and provides other services to Iowa State University. ISU is not a "biggie" in government research funding. I believe we are 53rd in the United States, per NSF statistics. Therefore, I think we are somewhere more representative of the top 100 research universities than perhaps the larger schools.

At the present time, we have 174 current United States patents and 8 royalty-bearing licenses. The royalty income is $80,000 to $100,000 per year. In past years, that has peaked about a quarter of a million per year. We do have active patent licensing or, if you choose to call it, technology transfer program.

I heard questions this morning relative to disposition of royalty income. We were founded in 1938, and have had this policy (to the best of my knowledge) ever since that time: When we receive royalty income, 15 percent of that gross income goes to pay our administrative costs. Then we deduct our expenses for patent prosecution, which, incidentally, we have done outside.

The remainder is net royalties. 15 percent of those net royalties go to the inventor and 85 percent go back to the university to fund research, education, and service projects.

Since 1938, we have funded $2.7 million worth of research and educational projects, with $1.5 million just in the last ten years.

Our research effort at Iowa State University is about $18 million a year, only one-third of that from government grants and contracts. The balance of research funding comes from state funds and industrial sponsors.

In that area, I find that nearly all of these require an enormous amount of additional development, either by the company or somebody before it is ready to go on the market.

The question is, who is going to spend this money and under what terms?

I suppose if there were a case where something deliberately was being suppressed, there ought to be a way for the government to step in and do something.

But I have never heard of such a case. From what I listened to today, nobody else has either.

CHAIRMAN JOHNSON: Does the fact that no case exists mean we shouldn't try to protect against the possibility?

MR. SNYDER: I think you are creating a bogeyman that just doesn't exist, and then you are trying to figure out how to destroy this bogeyman. I am really more concerned with how the act is going to be administered.

When the President came out with this policy stating it was not necessarily in the public interest to take title to inventions --

CHAIRMAN JOHNSON: Hold up while the reporter puts in new paper.

(Pause.)

CHAIRMAN JOHNSON: Go ahead.

MR. SNYDER: I was interested in finding out just what the attitude of the different agencies that sponsor work at the universities was going to be following this statement of the President's policy.

I checked with both AEC and NASA. They were already welded into a fixed policy. The Department of Agriculture said it didn't apply to them.

As near as I can tell, the Department of Interior said that -- Well, they more or less ignored it.

The Department of Defense, at least as to inventions relating to the public health area, became tougher than they were before.

I was asked to comment on this matter of mandatory licensing. I have mixed feelings about that.

I belong to the Licensing Executives Society and I understand Mr. Jacobs is going to address you on that subject. I was one of the founding members of that organization. I understand LES conducted a poll of its members on this point. Some thought it was all right and some didn't.

Personally, I have trouble with it. The Constitution says these rights shall be exclusive. If they are not exclusive, are we in effect revoking the Constitution?

Also, I resent the presumption that appears to be present that a patentee is not exploiting an invention to the fullest.

I just don't believe that is so. Even if he isn't, how does ERDA or anybody else within the government know how to do it better? But most importantly, I just don't know what is going to be the effect in the future on private R and D if the government is going to step in and require mandatory licensing or claim title to these things.

In prior testimony, there was allusion to the fact that some companies did suppress patents or perhaps did not exploit them to the fullest.

I recall talking to a friend of mine who was with Standard Oil of Indiana. He reported going through some old correspondence dating back to World War II. One of our Senators had written to Standard Oil and said that in view of the gasoline shortage and all, wouldn't it be good if Standard Oil were to release the patents that they had on fuel saving devices. Well, of course, it was pointed out that this was purely a myth. But it is a little disturbing to think that that idea is still around.

The only suppression of patents that I know of is that which has been done by the government.

On the question of background rights, at first blush, I didn't quite know how to take that. In a way it sounded like the Indians trying to recover Manhattan Island, or the Russians trying to take back Alaska.

Personally, I find it troublesome because I don't

of our electricity is generated by nuclear power. This, after all the hulabaloo over the benefits we were going to realize from nuclear energy

The first NASA act carried patent restrictions similar to those of the AEC. There was a real howl over this, too, because the contractors dealing with NASA had become used to the DOD policy.

These brief reflections are not without a purpose. The current energy bill before Congress purportedly carries some of the same restrictive and regressive patent provisions of the past.

If you and I are to see any long-range relief from the energy crisis, why adopt policies tailored to discourage innovation and private investment?

Lest I sound totally anti-government on invention matters, let me say that government supported inventions in the past have been productive. Morse's first telegraph line was built with government support. The Wright Brothers' airplane received considerable support. Even the railroads were built on land granted by the government.

I have tried to place in perspective the effects of governmental policy on the workings of the patent system as applicable to universities.

The universities really are in an awkward position with regard to patents. They do an enormous amount of scientific research -- in excess of $1 billion annually. But no university is in a position to capitalize directly on the inventions that evolve from such research. That is, no university is going into the business of manufacturing and selling products.

The only real outlet for the results of their creative work is by way of a license to a company. This requires some attention to patent matters if anything viable is to be transferred.

As a closing point -- (this is to the letter, now) -- I wish to say that we as taxpayers have a great national resource in the talents of the university research investigators and in their facilities.

one. The copyright law forbids it. The Constitution gives the federal government the power to grant patents -- but to itself?

When the government does take title to a patent that is a little like you or I writing checks to ourselves on our own account. There may be a reason for doing so, but it's a little silly to think that anything really tangible is created in the process.

The patent only gives the patentee one right. That is the right to exclude others from making, using or selling the invention. To my knowledge, the government has never excluded anyone, or at least did not until it started to grant exclusive licenses.

If the government is going to continue to do that, sooner or later it is going to have to be prepared to take the next step; that is, to sue infringers. Beyond that, any suit for infringement is going to have to prove damages. How is the government damaged by such infringement? The ultimate conclusions become absurd.

The real heart of much of the furor surrounding government sponsored inventions is this: The fundamental notion prevails throughout many federal agencies, university communities and with some members of Congress that because any government money at all was spent on an invention, it should be freely available to all. It is this notion that should be subjected to close scrutiny to see if it really serves the public interest.

Firstly, the idea that everything should be pooled into a communal storehouse where it is freely available to all was tried by the Pilgrims. It did not work then, and it will not work now, and for precisely the same reasons.

Secondly, assume the invention is a new computer, a new nuclear reactor, a new drug or some such, and is properly patented. Now you and I and the milkman and your barber all have the right, presumably, to a royalty free license under that patent. But now that we have that right, what do we do with it? The fact is that such a right is meaningless to us as individuals, and such an invention may benefit only a few companies.

If they want it, why not let them pay for it? Why should we?

When I first entered the patent business about 20 years ago, I went to work for Borg-Warner Corporation. Borg-Warner, basically, was a supplier of parts and components to the auto industry. Without patents to protect what they made and sold, they would have been skinned alive. So I had the benefit of having ground into me a very clear concept of just where patents fit in the picture.

But then in 1965 I joined a company called University Patents to work with the University of Illinois and a few other universities on the development of inventions that came out of their research. I have to confess, and I used to teach at the University, that this was quite a change in environment for me.

But nonetheless, we are all products of our own experience. While I have no particular brief for industry here, in my capacity, I have to deal with industry all the time. I think we have to give some concern to the way industry looks at these things.

One of the questions I have is just how this proposed policy is going to work in light of past experience. We have quite a wealth of experience to draw on, although I didn't come loaded with statistics, for which I apoligize.

To give an example, about a year ago there was an article in the Wall Street Journal by Edward E. David, entitled, "Moon Technology Five Years Later." Now, I am not a compulsive writer of letters to the editor, but I couldn't resist this one. So I took it upon myself to respond.

As I said, this is over a year old, so you can take it for what it's worth. I wrote to Mr. Robert L. Bartley, the editorial page editor. I said , Dear Mr. Bartley: This is in regard to an article by Edward E. David that appeared in your editrial page Friday, August 2nd, entitled: "Moon Technology Five Years Later." This was an excellent article and did point out some of the problems in transferring technology from federally-sponsored research into the channels of commerce. Mr. David was correct in his observation that for all of the billions of dollars that have been spent, there is darn little to show that is of tangible benefit to the taxpayers.

Many companies want and need new products and processes that might aid them in their business, and many would like to take advantage of the wealth of technology that has been generated by this type of research. The real problem is, how to do it.

A further argument against government ownership and then granting exclusive licenses through a licensing program: "The proposed Federal Inventions Administration would certainly cost the taxpayer a great deal of money -- probably much more than returns from commercially utilized inventions would ever hope to return in license fees and royalties. Costs of policing patent rights on the part of the Government involving court actions would be tremendous. Returns from nonexclusive licenses, even assuming a willingness to pay a fair royalty (not more than one percent of manufacturer's gross selling price) would be very low. If exclusive licenses are to be granted, disposal by public bid would be the only way to avoid favoritism and corruption in the Administration. Most of the patents would probably still end up in the hands of the original developer with only nominal returns over costs of administration." (P. 725.)

The strongest equity argument, at p. 742, against competing licenses: "It would clearly be inequitable to deprive the inventor-contractor of an invention on the basis that it falls within one of the categories of Section 4(a) and that he has insufficient equities to retain an interest therein, and then grant the rights to another person with even less equity.

The best statement that I really feel is applicable here, relating to monetary rewards to an inventor --

CHAIRMAN JOHNSON: Is this near the end of your presentation?

MR. LUKASIK: I can summarize it then. It's taken from a publication, Protection of Industrial Property in the USSR: "The Soviet system pays much heed to the nature of the work and interest of the inventor. A patent means the inventor would only obtain a return when he begins commercial exploitation of the patent. As a result, inventors, scientists, engineers, are obliged to spend much time and effort on matters not in their line. Experience has shown such attempts often end in failure and dampened enthusiasm.

On the other hand, issuance of a certificate of authorship eliminates such a waste of time, enabling the inventor to devote himself wholly to creative work."

In spite of that policy, particularly in Government employee matters, the inventor in the Soviet Union can,

the invention to his employer and (2) insist that the employer take the required steps to protect his interest; i.e., file a patent application and report it as a subject invention to the government.

Another great advantage to the public provided by the proposed Technology Transfer program will be early publication of the invention in an Abstract of New Technology to be submitted by the contractor. Thus, while the contractor's patent department is evaluating the invention for patentability, the public will be made aware of the new technology which may or may not be protected by a patent.

If a patent application is never filed, the invention described in the published abstract will be dedicated to the public through publication. The public also benefits from early publication of an abstract through advanced knowledge of new developments.

As soon as competition becomes aware of a new invention which may or may not be patented, they must either design around the invention to avoid future patent infringement or they must approach the potential exclusive licensee for a license. One advantage of publication is the stimulation of innovation through competition. The other advantage is the reduction of duplication of R and D through early visibility of the technology -- There is no need to invent the wheel again.

The Commission on Government Procurement also recognized the problems of routinely taking principal rights and reliance on deferred determinations and after the fact disposition of patent rights. These shortcomings include deferred utilization, increased administrative costs, and a lessening in the willingness of some firms to participate in government research work. The proposed revision is similar to the "Alternate Approach" (Attachment 8) recommended by the Commission and strikes "a reasonable balance between the public and private equities involved and recognizes the multiple values in the public interest. The public will benefit from a patent policy which not only promotes commercial applications of the patents, but also insures maximum public benefits from the expenditure of public funds." (Attachment 8.)

For the above stated reasons, I submit the attached model patent section for your consideration.

(6) A system whereby federal R and D property sought by private companies for commercial development could be sold or licensed to them for an amount equivalent to fair market value, and the same property sought by other public institutions for dedication to public purposes could be sold or licensed for half of the fair market value wherever practicable."

The statement goes on to support a "title" policy in most respects. In spite of its general support of a government "title" policy, Senator Morse's statement contains what I believe to be the gist of the proposed patent section:

"However, even if the subcommittee remains in doubt on this point, and believes that additional incentives are needed, Mr. Chairman, I ask the subcommittee whether the writing of incentive provisions is not a simple matter? Isn't it possible for a bill to provide, with great ease, for furnishing contractors with incentives, and also protection, by means of exclusive licenses to identified patents? Could not these licenses extend for three to five years, subject to renewal if the contractor shows he is making an effort to develop the patent? I submit that formulating such a system would be child's play for this committee."

"May I ask further -- would not such an approach have the advantage of retaining our successful 'title' provisions of the past, and the additional advantage of almost unlimited flexibility in the future, as to the terms and conditions of licenses to be granted?"

In view of the statement above, perhaps the section should be entitled "Patent Incentives Provision" rather than patent rights. I mention this because there are several other, very important incentives contained in the proposed section.

For example, making a monetary award to the inventor would provide a residual interest in the invention in the inventor's name which he cannot dispose of. The Congress thus re-asserts its Constitutional responsibility to dispose of and make all needful rules and regulations respecting the territory or other property belonging to the United States.

Similar Congressional action may be illustrated by the Homestead Act and the Morrill Land Grant College Act.

compiled a comprehensive report entitled "The Prospects for Technology Transfer."

I respectfully submit the attached amendment to Section 9, as my proposal to accomplish the wishes of the majority of each of the committees which I have mentioned.

The suggested policy provides:

a. Clear guidelines for Department action with sufficient discretion remaining in the agency making the day-to-day decisions. Initiative in determining practices and procedures remains in the operating agency who is most familiar with the problems and needs of their individual spheres of activity.

b. Need for exclusive rights -- Witnesses at the hearings placed great emphasis on the role that exclusive rights can play and have played, in stimulating private investment in developing and marketing inventions resulting from government R and D contracts.

c. Allocation of exclusive rights at the time of contracting is a great incentive, since it assures in advance that commercial exclusivity is available; can spur acceptance of government contracts in the first place -- applications to work of the best commercial expertise available to the contractor; and conscientious effort to accomplish the all-important step of identifying and reporting inventions.

d. Pre-contract review is not required because of the proposed deferred determination procedure.

Without going into the details of Technology Transfer, I will now list the recommendations made by the Select Committee on Small Business in their report:

"1. All federal agencies which support research and development should:

(a) include a new technology reporting clause in contracts;

(b) assure that intramural laboratories follow a proper identification and reporting procedure;

(c) separate, where necessary, the technology from a security classified context, so it may be furnished to all potential users;

I am very concerned that you have been getting some false information about licensing program.

AEC and ERDA have only granted one exclusive license, exclusively in the United States. That was just a few months ago.

We didn't grant any exclusive licenses to any foreign companies in the United States.

I just don't know what information this was predicated on, but I would really like to have it.

MR. ADAMS: I would be glad to communicate with you on the subject. I will have Sparky follow up.

CHAIRMAN JOHNSON: Well, Mr. Adams, thank you very much and thank the members of the Council for taking their time to follow the subject and give us the benefit of their thoughts.

MR. ADAMS: Thank you.

CHAIRMAN JOHNSON: Our next participant is Frank Lukasik, a patent attorney. He had a number of experiences in the Department of Interior working on problems. He is now a patent attorney with the Air Force. I gather he is appearing in his private capacity here today.

MR. LUKASIK: Thank you. These comments were actually prepared several years ago. This isn't the first time I have tried to convince a body that this is the proper way to handle inventions made under ERDA programs. My views are contained in my papers.

First I would like to read from the paper, then go to a compilation of statements taken from some of the hearings on the Federal Invention Act of 1966. In trying to think of a name for this proposed patent program, my first thought would be the "Patent Incentive Program." The second possibility would be the "First Option Plan," and the third, as a government employee, would be a "Use It or Lose It Plan."

Mr. Chairman, in my opinion, the patent provisions promulgated by ERDA in compliance with the Act will not serve their intended purpose. The major difficulty which I found was that on the one hand they are attempting to attract the highly skilled, innovative, research community to invest its

However, there is a need to utilize ERDA plants and laboratories to conduct work for others and the objectives stated in Section 9-9.100, including the recognition that the patent policy is an important incentive in getting inventions to commercial utilization, should be taken into account when ERDA is the seller rather than the buyer. It is difficult for a private buyer to give up rights to control and own inventions resulting from work he has paid for; nor is there a good justification for a buyer doing so merely because the Government is the seller.

Since ERDA recognizes that it must work in cooperation with industry to obtain "commercial utilization of all efficient sources of energy," I suggest that ERDA must also accommodate the realities and permit private sponsors to retain the basic rights to inventions and discoveries that they pay for.

In closing I would like also to note that so long as a more liberal policy exists for privately sponsored work performed in ERDA's Richland facilities than for such work conducted in ERDA's Oak Ridge facilities, private sponsors will be naturally inclined to choose the former. My client's interest is in getting more private development in the Oak Ridge area. While we do not object to fair competition by our counterparts interested in Richland, we would like to compete on an equal basis.

Sincerely,

O. S. Hiestand

OSH/drb
cc: Mr. Thomas A. Hill

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November 10, 1975

James E. Denny, Esquire
Assistant General Counsel
for Patents
Energy Research and Development
Administration
Washington, D. C. 20545

Dear Jim:

I am writing on behalf of the Roane-Anderson Economic Council (R-AEC) in response to the proposed ERDA patent policies published in the Federal Register of October 15, 1975.

As you may know R-AEC is an organization of businessmen that has been active for a number of years in seeking more private industrial development in the Oak Ridge area. One of the Council's long-standing projects has been to obtain a relaxation of the AEC (now ERDA) patent policy with regard to privately sponsored work performed at ERDA facilities in Oak Ridge. Apart from the general impetus for industrial development and economic benefits to the local area, the Council has been particularly concerned that the patent policy enforced at Oak Ridge is more restrictive than that permitted in the ERDA facilities at Richland, Washington.

From discussions with Len Rawicz I formed the impression that the proposed new patent policy would recognize privately sponsored work and provide for appropriate guidance on granting waivers. However, in reading the published regulations I do not find that this subject is addressed specifically and do not believe the guidance is sufficient to eliminate the restrictions and inconsistencies that now exist.

Section 9-9.109-6(a) sets forth the general policy for waiver of patent rights under contracts with ERDA and section 9-9.109-6(h) states some examples of situations where a waiver might be appropriate. Included in the examples is a situation

The fact is, if granted an exclusive license, a corporation doesn't really have a lot because we do not know of a single instance where AEC-ERDA has backed up an exclusive license when the company that had it felt that there was an infringement.

If such licenses are granted, it is generally felt that it is much easier to get an exclusive license if you are a foreign corporation than if you are a domestic one.

Finally, we can't help but think that there is somewhat of a conflict set forth in Section 9-9109-6e headed "Content of Waiver Requests."

Part of this section states as follows: I quote, "A full and detailed statement of facts to the extent known by or available to the requester..."

Then it goes on to set forth the information that is needed and it stresses that a full and detailed statement of facts must be included.

Then at the very end of this section it further states, "All material submitted in requests for a waiver or in support thereof will be made available to the public after a determination on the waiver or request has been made, regardless of whether a waiver is granted. Accordingly, requests for waiver should not contain information or data that the requester is not willing to have made public."

This really seems to present a problem. If they want the waiver, they must submit total, complete information. At the same time, whatever they submit is going to be made public regardless of the determination.

To me this is a real Catch-22 -- a Hobson's choice. Damned if you do -- Damned if you don't.

When a new, effective patent policy is finalized, we suggest that a good step toward involving the private sector would be to conduct a conference for the leaders of industry to discuss with them commercialization and how they can best participate in ERDA's research and development program.

Naturally, the best possible site for such a conference would be Oak Ridge, Tennessee, with the large and capable Oak Ridge National Laboratory, its Y-12 Plant, plus the Oak Ridge Gaseous Diffusion Plant and the fact that it

What do I mean by different types of relationships?

Let's look at three categories.

1. There is the case where a private corporation simply wants to spend its money to sponsor certain types of research in the national laboratory. This is allowed where the capabilities don't exist elsewhere.

If a company wants to spend its money to do this research, then it ought to be able to get a waiver without much trouble.

I know there are those who will say you must protect the government's investment. They have all that money invested in previous work, in personnel and buildings which are depreciating daily; and you have to figure and weigh that against what the private sponsors paying.

Carried to the extreme, though, you can prove that nobody has a right to a waiver.

On the other hand, we come back to the question: "Do you want to encourage participation, or don't you?"

We think that if you do want to encourage it, then it should be a simple matter to grant a waiver to someone when they are spending their money to sponsor research.

We have asked our attorney to study these concerns and have included his letter to Mr. James Denny, which suggests a solution for one portion of this problem as part of our testimony.

In this letter we suggest it would be appropriate to include a separate section in the regulations entitled "Patent Policies Applicable to Privately-Sponsored Work Performed by ERDA at the Sponsor's Expense," and that such section provide for a full governmental waiver of patent rights in such situations.

Where the privately sponsored work requires or benefits from work performed by an operating contractor for ERDA, it might be appropriate to reserve a non-exclusive license to the government if the ERDA paid-for work contributes significantly to the invention or discovery.

Our next participants are Leslie S. Dale and Ben Adams.

MR. ADAMS: Mr. Dale could not make it.

Statement on behalf of the Roane-Anderson Economic Council, by Ben Adams, Secretary, before the Public Hearing on ERDA Patent Policy, Germantown, Maryland, November 18, 1975.

My name is Ben Adams. I am a citizen of Oak Ridge, Tennessee; and I am here today representing the Roane-Anderson Economic Council.

This organization is made up of private businessmen in Roane and Anderson Counties.

Our organization was formed early in 1973 with encouragement from the Atomic Energy Commission.

One of the main purposes of our organization is to try to broaden the tax base with increased private industry in our two counties.

This would tend to further the goals and aims of ERDA by making the Oak Ridge area less dependent upon the government -- ERDA.

While our two counties have now and have had for many years a good industrial development effort -- the fact is that private industry has never come into our area in any great numbers.

One of the principal reasons is that many industries have been frightened away by the dominance of the single industry, government-owned complex at Oak Ridge.

We have tried to appeal to industries who will benefit by being near energy research and development such as we have at Oak Ridge.

Through our initial contacts we found there was a large corporation interested in financing research at Oak Ridge National Laboratory. They were holding up, however, because if a patent developed they would not get it.

As we made additional industrial contacts over the next months and years, we continually ran into keen interest in the patent subject.

We have a lot of that. I don't know, I think it is just human nature. If there is a patent, then that part of human nature which makes them want to discover things for themselves has some theoretical commercial value.

I don't know what great advantage patents give people, in practice. Infringement seems to be very easy, and the recourse against it is almost nonexistent.

CHAIRMAN JOHNSON: So from that standpoint, patents would not have the blooking effect you feel.

DR. DICKS: Well, I think they do have a blocking effect. I would agree with you, but it is a complex phenomena. It is not a simple, straightforward thing that one can easily analyze.

CHAIRMAN JOHNSON: Mr. Goodwin?

MR. GOODWIN: Do your objections go to the point of saying the government should abandon all efforts to get background patents?

DR. DICKS: No, but I think it should be negotiable. Highly negotiable. I think that negotiations should be well understood by the procurement people in the government. There is no reason to say that government should abandon seeking background data because you can sometimes get it easily.

CHAIRMAN JOHNSON: Mr. Eden?

MR. EDEN: Should those negotiations leading to the taking of background rights include discussions as to what royalty should be paid?

DR. DICKS: This is an objection, that the royalty is usually left to be determined later by the government, by some unknown process.

It would probably make it easier if you could determine a royalty to begin with, but I don't really know how you do that, on what basis one decides upon the royalty on something that is probably not going to be applied any time soon.

So I can see the difficulty that the government would be in in deciding what the royalty should be at the time of contract award. But I think it would be helpful.

But are you distinguishing at all, Dr. Dicks, between background data and background patent rights, or do you lump them together?

DR. DICKS: The patents are easier than the data.

CHAIRMAN JOHNSON: I see.

DR. DICKS: I think we do not have a solution to the data problem. There is some possibility that you can get a solution in any negotiation, to the patent problem.

CHAIRMAN JOHNSON: Are there other questions?

MR. RITZMANN: Dr. Dicks, you have been talking about the situation where the University of Tennessee Space Institute has been contracting with ERDA. And you have been subcontracting with subcontractors?

DR. DICKS: Yes.

MR. RITZMANN: Do you do any work with private industry in energy research?

DR. DICKS: Do we?

MR. RITZMANN: Right.

DR. DICKS: No. It tends to be the other way around. They are doing work for us.

MR. RITZMANN: So you don't know how private industry would treat you in a similar situation?

DR. DICKS: Well, I have had other experience in contracting to private industry. It depends on the industry. It differs drastically from company to company.

MR. RITZMANN: Do they in general require background rights to practice patents that may come out of contract research you are doing for them?

DR. DICKS: No. As a matter of fact, we -- That issue essentially has never come up. There have been agreements made on who shall own what portion of what patent rights that are generated in work, but the question of background data has not come up.

CHAIRMAN JOHNSON: George Kimball.

DR. DICKS: Well, we have to have Government approval. Of course, in the process we would negotiate with industry, come up with -- The University was just simply a go-between. We had no interest in patents or particular proprietary rights in this.

MR. DENNY: If you would come up against a problem you would go back to ERDA?

DR. DICKS: Yes, we would go back to ERDA. At unusual times we would have some three-way discussions.

As you know, in the contract procedure it is our responsibility to negotiate the subcontracts. We are held responsible by the Government if we make a mistake in negotiating the subcontract and do not have access to background data or patent rights because of this contract. The Government can hold us responsible.

I think this never comes to light, but that is the legal situation.

MR. DENNY: So if you modify the OCR clauses, you must go back to ERDA for approval?

DR. DICKS: We must go back to ERDA for approval, but approval by ERDA does not constitute responsibility. In this situation you get from the Government, you ask them, "Well, may we issue this contract?" And they, the Government, will write you a letter and say, "Yes, you can issue this contract, but it does not absolve you from any responsibilities that you have under your contract with us."

MR. DENNY: I mean specifically, if you have trouble with patent provisions, do you go to an ERDA patent attorney?

DR. DICKS: Yes, we will call in ERDA patent attorneys at appropriate times.

MR. DENNY: That is one advantage, then, I should say, for new patent clauses, because ERDA does take the responsibility if waivers are granted and you are off the hook.

All you have to do is pass them on.

DR. DICKS: That makes us very happy, but it does not help us with getting the final negotiation through.

just recently been published --

DR. DICKS: We were told that if we asked for these provisions that we could get them. In other words, we could have had a contract change instituted had we agreed, and it appeared that the Government was ready to agree. So we did review these new provisions and decided not to use them in conjunction with the people that we were trying to negotiate with.

MR. DENNY: You mentioned a 9-month delay.

DR. DICKS: This is typical.

MR. DENNY: This is not all patents, I assume?

DR. DICKS: No, it is not; but I would say a substantial portion of it was patents.

Of course, a part of it is just in the Government approval cycle. But probably about two months of that involved patents, seriously.

MR. DENNY: At the tail end, or have you had other problems?

DR. DICKS: Those were the most important things we had to negotiate, so they persisted to the end.

MR. DENNY: I don't know how you all do it, but I know sometimes the Atomic Energy Commission put the patents off to last and then started to work those over; and patents took a lot more blame than if they were negotiated parallel.

DR. DICKS: We started negotiating the patent provisions in May, and just finished in November. We started negotiation on the patents. There were other things being negotiated. As it turns out, there were no problems in cost, for example, in this negotiation.

MR. DENNY: Did that persist to the end?

DR. DICKS: I say there was no problem at all with costs. It was just in the general provisions, and the most difficult thing was the patents.

MR. DENNY: The OCR patents clauses?

DR. DICKS: Yes, but we could have used these.

going to know anything about it, it is going to be John, because he has been dealing with us in the Office of Coal Research for years.

I was always under the impression that the OCR restrictions were much stronger than the provisions of this contemplated policy, particularly as far as background is concerned.

I agree it was much easier to negotiate because in effect the Department of Interior at that time said, "Well, either you take it or that is it." There was no negotiating there whatsoever.

Possibly, with this new situation being more flexible than this, there might be a longer time interval. On the other hand, I think you have a better situation in sight.

Do you have any specifics, particularly insofar as background? OCR requirements were much more rigid and I thought based on a much wider scope than these narrowly drawn regulations we are talking about here today.

DR. DICKS: I am talking about practice, not philosophy.

In the case of an OCR negotiation, the negotiation in general was much easier and much more rapidly accomplished. I don't think I can think of a case in OCR -- and, of course, your experience is the widest -- remember any case where you did go in and forcibly remove background patents from any industry. I don't think it ever happened.

What we have now is the threat that that will happen, based on the national need, of course, in the present emergency situation. What I am saying is that in operation in the past this has just never been implemented, but it looks as if you expect to implement it now.

Our reading of this is that it is -- You know, we were told that it represents an easier patent policy, but that is not our interpretation. I think you will probably have other people here today --

DR. FUMICH: I think it is a problem of communications.

survive in the engineering field without R and D support from the government. They just do not have the internal resources to mount programs of their own more than twenty or thirty or fifty million dollars a year.

As we all know, it is going to cost a lot more than that to develop fossil fuel energy. So the point I would like to make is that we are interested in the actual operation of the system. Although the philosophy of the government acquiring all background patents might sound fine, certainly you can get a lot of public support for that, the implementation will damage the fossil fuel program.

There is one further point I would like to make. Procurement is an unfortunately very lengthy process at the present time. We are finding from the time that we make a technical breakthrough to the time when we can begin getting experimental data on the next stage, that this time may be now as long as five years.

About half of that is simply paperwork delay. It takes us under government supervision, is taking us currently about nine months to negotiate a contract for anything over a million dollars. This is just typical of what we observe happening in the energy field. Part of the negotiation delay involves detailed negotiations concerning patents and what the company keeps of that background data and what it will have to surrender under what terms. So I believe this concludes the points that we would like to make at this time.

CHAIRMAN JOHNSON: Thank you very much, Dr. Dicks.

I would like to ask you if your remarks are drawn to the policy of Government acquiring background rights, as you said, all background rights, as opposed to the clause that actually appears in the proposed regulation, which is a very narrowly drawn clause.

It really doesn't have the Government acquire ownership or even a license for anything but the demonstration plant purposes, and it provides only that under certain specified circumstances, namely, perhaps, of a theoretical nature, but still there, that a firm is not meeting the needs -- in other words, is acting as a dog in the manger and sitting on those rights and preventing the technology from being exploited by anybody but that one company -- that only in those circumstances would the Government exercise the right to request licenses to be made available to other parties.

AFTERNOON SESSION

(2 p.m.)

CHAIRMAN JOHNSON: If we can begin with our afternoon session, we will be running through until about 5:40 this evening.

Our first participant this afternoon is Dr. John B. Dicks of the University of Tennessee Space Institute.

Dr. Dicks, we will be glad to have your presentation at this time.

DR. DICKS: I am Director of the Energy Conversion Division at the University of Tennessee. We have what I believe is the largest fossil fuel development contract at any University in the country. We have $8 million to do magneto-hydrodynamic power generation research and development.

I would like to speak today about the relation between fossil fuel technology and patent policy. We are involved in attempting to implement Congressional and OMB policy of negotiating contracts with industry which involve various kinds of cost-sharing or participation. We intend going to larger stations in this development process where we are seeking some $20-odd million currently for matching funds, and beyond that, in demonstration plant scale technology.

If we follow OMB and White House policy, we will be looking for something on the order of $400 million or $500 million. We are having some difficulty in negotiating contracts because of current patent policy; and as we read the proposed new patent policy, it would make life considerably more difficult.

Now, I do not think anyone objects to the government's rights to patents that are generated under government-funded R and D programs. I think there probably is not always objection to the government having patent rights even where there are large amounts of contributing participation. But what one finds very difficult to negotiate is the government's rights to background data and patents that the government did not pay for, and in many cases, that are the basis of ongoing industrial profit-making enterprises. We are currently in negotiations with subcontractors that are essentially supervised by the government or certainly must require government

I don't know of any situation where patents have been put on the shelf, for example, not used, because of someone's desire to "suppress an invention." The Inventors' Council investigated many such stories. We never found a single case where a large corporation put "patents on a shelf" because of some large monopoly position.

I think I have said enough. I would hope there will be questions so I will remember some of the other things I meant to say. When I hear talk about the Patent System, like that of Ms. Till, I feel like Mark Anthony who came to the funeral of Caesar.

Thank you very much.

CHAIRMAN JOHNSON: Thank you very much.

Are there any questions at this time?

You completed your remarks within the half hour allocated. We do have the benefit of other statements made in other forums. We are glad you were able to come.

May I ask you, how are you finding the inventions coming in for evaluation and recommendation to ERDA?

MR. RABINOW: We have gone through quite a few we didn't like, but we found two we like. They come from basement-type inventors who are, generally speaking, technically untrained. They invent perpetual motion machines; they invent wave-energy machines that cost $60,000 per horsepower to install. They invent a great many things that are trivial. We try not to hurt their feelings.

But there were two that were pretty good. I sincerely hope ERDA supports them to whatever extent it can, hopefully with money. There is some possibility that ERDA will support the inventions in other ways.

I certainly think that if this program is successful, several things we hope will happen -- We will get inventions from universities and professionals so that we shall get a better grade of invention and hopefully this will carry over to other fields besides energy.

Most of the world supports inventions, Sweden, U. K., Denmark, Canada, Japan; they all support inventions with ongoing programs. This is the first time, I think,

I read the energy bill. Nothing must violate the antitrust laws. Here is a set of new laws which are quite unclear, rather nebulous in their extent, which automatically take precedence over the basic law of the Constitution.

There was raised today the question about expediency versus public good. NTIS has this problem. This National Information Dessimination Group now has the right to file for foreign patents. They find they must become "self-supporting." So must the Patent Office. It is expedient to say you are self-supporting.

The fact is that the Patent Office creates royalties on which we pay taxes and they they amount to some 20 times the total cost of the system; nevertheless, the Patent Office must become "self-supporting." The new bills introduced say that after a few years, we have to pay two or three thousand dollars more in "maintenance" fees.

The justification for the maintenance fees is partly to make the Patent Office self-supporting and partly to make patents not being used go into the public domain so that more people will use them. This last is pure unadulterated hogwash.

I know what happens in Europe. I often have to pay maintenance fees. What happens is that as soon as I can't sell a patent (they don't have to whip me with extra fees; I try hard enough) and when the bill to pay comes due, I drop the patent.

I assure you that not one has been picked up after that. God knows that if it is not attractive on an exclusive basis, it will never be picked up.

It has never been a question of royalties. If I can't sell a patent on an exclusive basis, I can't sell it at all. This nonsense of making a patent free so that everybody will grab it just doesn't happen. It did not happen with 15,000 German patents; it is not happening with 26,000 U. S. patents.

My watch regulator took 9 years to sell. If there were a fee system in effect, I would have dropped it. My headlight dimmer patent has expired. I never sold it, even though General Motors said it was the best thing they had ever seen; Chrysler put it in their specs; Ford

music composers, too. He can get practically life-time protection.

But if I make something completely new and different, I own it for 17 years. The more new and different it is, the harder it is to sell precisely because it is new and different and the human race is a low-pass filter. They like to "think through" about new things. By the time they filter it out, 10 years go by.

Industry is not likely to use very new things, either. The government supports a great deal of R and D. I think this is proper. The government should support R and D.

It is obvious that the Arabs have learned economics particularly since they can also send their kids to Harvard Business School.

One of the economic facts of life is that the people who sell oil will see to it that the cost of oil remains under the competitive cost of other energy. That is easy to do even at $20 a barrel.

So the government has to spend the money because wind, wave, solar, geothermal energies are too risky. I can bet that you (ERDA) can't make a profit in the next 5 or 10 years, but you should support R and D because you know that in 20 or 30 or 50 years there will be no oil in the world.

Whether in the history of the world, 20 or 30 or 50 years are different numbers, I don't know. It is a silly question. In the history of a nation, a hundred years is nothing. Therefore, the government has to do it, knowing that industry cannot, should not, can't afford it. ERDA has to.

When people talk that somebody may get a monopoly in the energy field, they are talking nonsense. Nobody is going to make much money on this. Certainly not big money. Oil will always be competitive for at least the life of any patent granted in the near future. In other words, if I had a wonderful invention on solar energy or wind power, I can be sure the Arabs will read about this patent and make sure their price is more than competitive with my wonderful invention.

A free patent may be used if it is useful in agriculture. That point was raised by Ms. Till, when she said that Department of Agriculture found they don't need to grant exclusive licenses.

But you can't expand the experiences of agriculture to the experiences of machine manufacturers. If I am a grower of wheat and I have a hundred acres and the Department of Agriculture develops a better wheat, which they did, a wheat free of some particular pest, I cannot monopolize the business. I can only grow so much of this wheat; and I want to because it makes my wheat crop more certain.

But I certainly cannot have a time-limited monopoly position, and I use that work not in a derogatory sense. Again, I do not have an economic advantage with my hundred acres. I couldn't produce enough wheat even for the local community. So I am glad to use the patent of the Department of Agriculture.

This is not true, for example, if I make phonographs. There, if I have a patent and can make a better phonograph than anyone else, as I can, I start a company and I lose money but I eventually sell the thing to Harman-Kardon. Now, instead of one company producing good phonographs, there is one in Denmark with a license to build such machines and a Japanese company coming out with one and an English company, and eventually many others.

When my basic patent expires next year, there will be four companies making these fancy record players. How the market will react to all this, I do not know; but it is a better record player. It cost me $730,000 to put it on the market. I would not have spent $730,000 of my own money if I didn't have an absolutely impregnable patent position.

Then I hear stories about patents being invalided by the courts. You have to get some statistics straight. Of my 209, not one was held invalid.

You may say this is just luck. But the fact is that less than one percent of patents get into court. Of those, a few get invalided because there are judges in some districts that say that all patents are no good. If you have crazy judges, you get crazy decisions.

I sold the foreign rights after some eight years of covering foreign countries with patents and the device went into four foreign automobiles.

In the United States, that clutch, outside of the fact it started a new class in the Patent Office because of the flood of improvement patents, was used very little. It was used by a few companies; but, basically, it "died on the vine" because nobody wanted to put up the needed tremendous money -- and I mean millions of dollars -- to develop the technology.

People who talk about the cost of a patent seem to forget that perhaps 5 or 10 percent is the invention and the rest is the sweat and blood to develop the secondary things that make the patent work, the ten, twelve years of development work, large monies, big staff, the "little problems" that must be licked, the "minor details."

How do you seal the powder that makes the clutch work? How do you dissipate the heat? How do you keep it from settling out? How do you do all the things a clutch has to do before it becomes a commercial item?

The government didn't do it. Industry didn't want to bother.

I was told if I could get my rights back by getting a special bill passed by Congress, then the financial people would raise several million dollars so we can start a suitable corporation.

For many reasons, I didn't want to do this.

I didn't think such a bill would have been passed by Congress.

Besides, I was very happy at the Bureau of Standards during my first reincarnation there. So I left the problem alone, and the invention sort of died.

People ask about other statistics. What happens to the patents which are made "free to everyone"?

I have a statistic not brought up this morning. During World War Two, we confiscated all the patents belonging to enemy people. There were 15,000 of these. These were not developed for weaponry; they were industrial

is involved in developing an invention, and I don't expect to teach them today.

Some of our large corporations have a very curious interest in the patent system.

I can quote three vice presidents of three of the largest corporations in the U. S. who told me privately that if there were no patent system they would be delighted.

One was a very large computer company, not the one I worked for.

Another was an automobile company, and the third was a very large electrical company.

Their point was simple. If there were no patents, their marketing powers would become even more dominant. They do not make money on royalties and patent exchanges. They would not have to do defensive research to protect themselves against some possibility that may arise in the future. Their marketing is so strong that if there were no patents they would not have to worry about anyone else entering their fields, and they would not have to support several hundred patent attorneys all over the world. They now have to cover at least 20 or 30 countries each time they get a valuable invention.

These large corporations do not depend upon their patent position at all.

So if patents were abolished or made free to everybody, it would mean that there would be no patent in a commercial sense. It would, perhaps, have some value in defining the inventor or perhaps some historical museum value so that we could learn later "who did it," but otherwise it would mean nothing.

It means that the large corporation would automatically win all competitions.

Mr. Land of Polaroid could not start up a company if he had no patent position.

I started two companies because of my patent positions. One became part of Control Data. The other is part of Harman-Kardon.

of my life in countries where everything was done by hand. When I was lecturing at Berkeley about this subject some years ago, one of the students said, "We have enough material wealth; we should concentrate on the beautiful things of life."

I said, "Before you argue with me about the beautiful things of life, I suggest you try an outside toilet in Siberia at minus 50 and then talk to me about material things vs. the beautiful things."

Anyway, since we have to improve the standard of living, the question is who does it, how it is done. We must understand the mechanism; otherwise, you get the kind of nonsense we heard today.

The great inventions of our time are not made by large corporations. Large corporations invent improvements which are very necessary and very important. But the great inventions of our century, that is, of my day, your day, are not done by the basement inventor nor the employee of a large corporation.

I would like to read a list published by the Ministry of State Science and Technology of Canada which lists the great inventions of the twentieth century and which were made outside of large companies.

I also had compiled such a list and have combined them. It is a long list,

Atomic energy, computers, vacuum tubes, xerography, FM radios, lasers, microwave technology, penicillin, radar, insulin, catalytic cracking of petroleum, jet engines, mechanized wiring, fiber optics, magnetic recording, holography, oxygen steel making, heterodyne radio, DDT, streptomycin, gyrocompass, rockets, titanium, cotton picker, Dacron, shrinkproof knitted wear, zipper, automatic transmissions for automobiles, self-winding wristwatches, continuous hot strip rolling of steel, helicopter, mercury dry cell, power steering, color photography (which is particularly interesting because it wasn't done by Eastman Kodak but by two violinists), air conditioning, Polaroid cameras, ballpoint pens, cellophane, hovercraft, optical reading machines, long-playing records, magnetic core memories, TV tape recording, foam rubber, and some others.

These were all done by highly trained people in universities, government laboratories, and small companies.

CHAIRMAN JOHNSON: Our next guest is Mr. Jacob Rabinow.

MR. RABINOW: I had what I thought was a coherent outline of what I was going to say this morning; but particularly after the attack on the patent system by the last speaker, I am afraid the subject will change slightly.

I am very concerned about the patent system, not only as it concerns ERDA and your particular problems but as it concerns the general welfare of our nation.

I am concerned that it isn't doing well, partly because I think the Department of Justice, with all due respect to the member here, doesn't like patent systems as a whole. Then there are the misinformed ideas I have heard here today about making "all government-owned patents free because that is somehow good for the public. One could extend that to say that all patents should be free.

Of course, a free patent is not a patent. It is just a beautiful piece of wallpaper.

If you make them all free, then you have no patent system.

I have heard a great many questions on statistics. I am a walking statistic. I have lots of facts.

What happens if you have mandatory licensing?

Is mandatory licensing in the United States the same as it is, for example, in Germany or Israel?

I will try to follow my outline on what I thought was a coherent talk. I will have to stray, and I hope you will forgive me if I exceed my time.

There are three ways in which a country as a whole can improve its standard of living.

I am talking about the total pie.

One is to rob somebody else. That is a good, classic way that has been done for many, many centuries -- either politically, or by an army, or by economic means by which poor people work for you and supply you with goods.

6. Travenol advises that they see no significant advantage in incorporating the zirconium phosphate sorbent system into its existing coil kidney system. Rather, they suggest the design of a new generation of miniature, parallel flow dialysis units to be utilized with the sorbent system. Travenol is correct in noting that Marquardt intends to employ existing components in order to utilize the Marantz/Greenbaum sorbent system in an artificial kidney device. We see this to be a significant advantage in that it will make available to the public the Marantz/Greenbaum sorbent system at an early date not dependent on the later development of components which Travenol feels might be more compatible with the sorbent system. As previously noted, Travenol is not precluded from developing an artificial kidney which incorporates the Marantz/Greenbaum sorbent system which the public may ultimately deem a better device than Marquardt's.

Recommendations

It is the belief of the Patent Branch and the grantor Institute that Marquardt's request and arguments for an exclusive license are well taken. (See NIAMD comments enclosed herewith as Exhibit H). It is our opinion that the position established by Marquardt Corporation through its initiative in funding further development of the invention after Government funding ended should be weighted heavily in favor of granting Marquardt's request. It is clear from the facts before us that no other commercial concern was willing to utilize the information available from the NIAMD contract to further develop the invention. It can be argued that Marquardt acted as a volunteer, and their request therefore should be denied. However, we believe that the ramifications of such denial would affect the public interest not only in this case, but also in administering our exclusive licensing program as it relates to future cases. It seems clear that there is a strong possibility that Marquardt would discontinue the further development that they propose without the guarantee of exclusivity; but possibly of more importance is the fact that we will discourage future applicants for exclusive licenses from continuing development with their own funds of DHEW inventions until an exclusive license is granted.

We further believe that the granting of an exclusive license is a necessary incentive to providing the funding for additional development required to bring the invention to the marketplace. Assuming the $4,000,000 estimate for further development to be approximately accurate, the request for a period of market exclusivity cannot be deemed unreasonable.

accurate, commercial introduction of a device which might infringe the Marantz/Greenbaum patent or patent application would not be forthcoming until four years and nine months from the issuance of a nonexclusive license to Travenol Laboratories. Since it is suggested that the exclusive license to Marquardt be for a period of five years from their first commercial introduction of the Marantz/Greenbaum invention, it appears that there would be only a short period of time, if any at all, during which Marquardt had an exclusive license, and Travenol would not be able to sell the result of its research and development program. In light of the above, we view Travenol's contention that the granting of an exclusive license to Marquardt would substantially deter research in the area to be without merit.

Additional Travenol arguments against the granting of an exclusive license to Marquardt are discussed as follows:

1. Travenol's contention that Marquardt might discontinue their development program because other circumstances may end any exclusivity granted by DHEW, i.e., failure of the Marantz/Greenbaum patent application to issue as a patent, is not considered to be relevant. It is clear that Marquardt is willing to continue development, if the license requested is granted, notwithstanding the possibility that the circumstances mentioned by Travenol might arise. Marquardt's concern at this point seems to be establishing as much protection as possible for investing their risk capital.

2. Travenol contends that the passage of medical device legislation may significantly delay Marquardt's development program due to the requirement for additional clinical data. It would seem that if Marquardt's program were to be delayed by such legislation, all other manufacturers would be similarly delayed, and Travenol's argument is therefore not relevant. If relevant at all, the argument lends support to Marquardt's request for an exclusive license, since the estimate for the costs of clinical testing would necessarily have to be revised upward.

3. Travenol suggests that the distribution and servicing arrangements which Marquardt will have to make with a company in the medical supply field should be firm prior to our granting of an exclusive license. Although it is agreed that a commitment from a company to provide these services would make Marquardt's proposal to bring the invention to the marketplace more convincing, it is felt that obtaining a commitment for such aid prior to the granting of the license is unnecessary and possibly undesirable. The main purpose in granting an exclusive license is to create an incentive in the licensee to seek whatever additional help it might need

Analysis

It is important to first note that the Patent Branch has made no detailed investigation as to the relative capabilities of Marquardt Corporation and Travenol Laboratories to bring the Marantz/Greenbaum sorbent system to the marketplace. Neither NIAMD nor the two corporations has raised the issue of capability. Accordingly, it has been presumed, and past performance of these corporations indicates, that either corporation, if it chose to do so, could bring the invention to commercial usage. Indeed, as already noted, Marquardt is in the process of testing protytypes of the invention.

We view Marquardt's basic argument in support of their request for an exclusive license as follows:

Marquardt has taken a basic discovery made through Government funding, which the Government and others in the medical device field refused to further invest in and develop to the point of practical application, and invested their risk capital to bring it to the point where it can now be identified as having definite commercial potential. Marquardt's desire for an exclusive position appears best explained by the fact that a great deal of additional funding is necessary to complete development and achieve commercial distribution of the invention. Without the exclusivity requested by Marquardt, they have no guarantee of recouping this investment and making a profit if other concerns can now capitalize on Marquardt's demonstrated success and enter the marketplace with a competing device.

In addition to the above, Marquardt raises the interesting argument that Travenol dominates the artificial kidney device market, and that granting of an exclusive license to Marquardt would actually bring competition into the marketplace, while the granting of a nonexclusive license to Travenol would only enhance Travenol's already dominant position.

We view Travenol's basic argument in support of their request for a nonexclusive license and denial of Marquardt's request for an exclusive license as follows:

The availability of nonexclusive licenses to all investigators will encourage research, while the granting of an exclusive license to Marquardt will substantially deter research in the area.

There has always been some doubt whether nonexclusive licensing or dedication by publication of the results of basic research would guarantee the necessary development to bring such results to the marketplace. This skepticism was reflected in a change in Paragraph 6.3 of Department Patent Regulations, permitting the

2. Travenol has estimated a development time of about four years. A comparison of schedules shows that Marquardt will have a significant lead time -- approximately three years -- to effectively enter the market and establish a firm position before Travenol has an opportunity to introduce a competing product. In view of this long lead time, it is expected that Marquardt would reconsider their threat to discontinue their development work if they do not receive an exclusive license.

[Briefer's Note: At another point in the Travenol reply brief, Travenol states that Travenol and any other licensed organization will, of course, attempt to shorten their development programs to minimize the impact of Marquardt's lead and to more effectively compete with Marquardt. It would seem that this statement obviates the argument made above and lends support to Marquardt's need for exclusivity to protect their investment.]

3. Travenol contends that a granting of a nonexclusive license to all requesters will encourage research. It is submitted that the granting of an exclusive license to Marquardt will substantially deter research in the area. If nonexclusive licenses are issued, one can assume that Marquardt will make the best of it by either continuing its development, or by selling its proprietary rights to another manufacturer. It is reasonable to expect that the results of their effort to date will not be thrown away by Marquardt, in view of the admitted potential value of their work, but will reach the public in one way or another.

4. It has been argued by Marquardt that no other firm has shown interest in the project, and because Marquardt has proceeded with the program, they should be granted an exclusive license from the Government. However, Travenol could argue that if it and other firms had the full benefit of information gained from the Government-funded program, as did Marquardt, it is probable that Travenol and possibly others would have proceeded with the development of the zirconium phosphate system at a much earlier date.

5. Travenol indicates that if medical device legislation is passed in the near future, Marquardt's development program may be significantly delayed due to the requirement for additional clinical data not now anticipated.

	Project Period and Cost	
Phase II		
Column design and test	5 - 19.5 mos.	$107,000
System design and test	13 - 23.5 mos.	40,000
Final design and prototype fabrication	23.5 - 25.5 mos.	21,500
Toxicity tests		11,200
Phase III		
In Vitro test	25.5 - 26.5 mos.	3,200
Acute and sub-acute In Vivo tests	26 - 38 mos.	66,000
Phase IV		
IND preparation	32 - 33 mos.	2,400
Clinical trials	34 - 46 mos.	200,000
NDA preparation	40 - 48 mos.	10,000

Marquardt Corporation's Brief in Reply to Travenol's Brief Requesting a Nonexclusive License

Marquardt's reply brief is enclosed as Exhibit F. In addition to the arguments presented in its initial brief the following points are raised by Marquardt in its reply brief:

1. Marquardt contends that Travenol's brief is merely a technical proposal (not accompanied by supporting evidence), which suggests a means of reproducing the research and development effort Marquardt has substantially completed. It is contended that Travenol could do this preliminary work in its proposal even if Marquardt were granted an exclusive license. Travenol makes no commitment to bring the Marantz invention to the marketplace and therefore could abandon the effort at any point of time for whatever reason it chose.

2. Travenol has indicated that it would not initiate its development program until nine months after receipt of a nonexclusive license from the Department. Furthermore, Marquardt contends that by proposing a four-year schedule to reach the stage of development which Marquardt had reached in two years, Travenol indicates that it does not intend an all-out effort.

d. Establish production facilities and tooling to produce the sorbent material, the sorbent cartridge, and the kidney machine itself with the several mechanical components.

e. Provide for distribution and service facilities.

f. Establish a program to train technicians in the operation of the Marquardt equipment. Marquardt anticipates that with a prompt decision on the license, prototype machines can be on the market by the end of 1971.

6. There is no assurance that any other company will succeed in developing an effective sorbent at all. The award of a limited, exclusive patent license to enable Marquardt to continue development would provide the highest degree of assurance of early availability to the public of a proven device.

7. If it had not been for Marquardt expenditures, there would be no commercial device in current production. Furthermore, had Marquardt not been willing to expend these funds, there would have been at least two years' delay in bringing the product to the public. The original absorption idea produced under the research contract was only an initial step and was useless without the addition of other chemical treatment processes which Marquardt has accomplished in its self-financed development effort.

8. Marquardt estimates that by the time a machine is ready to be marketed, the Government funding will have been no more than 3/4% of the total amount expended in the development of the machine, with the remaining 96 or 97% coming from Marquardt or its associates. Furthermore, the Government will be compensated for its investment by the royalty under the proposed exclusive license agreement.

9. The granting of an exclusive license in this instance will encourage private investment in the development of other DHEW inventions.

10. Marquardt contends that the granting of an exclusive license to Marquardt will promote competition, while the granting of a nonexclusive license to Travenol Laboratories would enhance the dominent market position of that company in artificial kidney equipment. Marquardt indicates that the artificial kidney machine market is dominated by Travenol, with over half of the overall market, and with most of the coil machine and replacement coil markets. Marquardt's advent as a manufacturer of artificial kidney devices should bring the usual incentives of competition

On the basis of Travenol Laboratories' objection, it was agreed by DHEW, Marquardt Corporation, and Travenol Laboratories at a meeting on October 8, 1970, that briefs supporting the requests for licenses would be prepared by both parties and submitted to the Department by November 6, 1970. It was further agreed that, after review by each party of the other party's initial brief, reply briefs would be submitted to DHEW by November 30, 1970. Both parties have provided the materials deemed necessary, and it now becomes incumbent upon the Department to determine which request it wishes to grant.

Synopsis of Marquardt Brief Requesting Exclusive License

The Marquardt brief, enclosed as Exhibit C, is 40 pages long. Accordingly, for the sake of brevity, only the more salient arguments supporting their request for an exclusive license are synopsized below:

1. Upon completion of the work funded by NIAMD, the details of the basic invention were made available to industry through Marquardt's July 1968 final report to the Government and through technical literature by the company's consulting medical authorities. At the first Annual Contractors' Conference for the Artificial Kidney Program on January 23-24, 1968,Marquardt disclosed the Marantz/ Greenbaum invention to the ten other participating contractors. (Travenol did not have a contract from NIAMD at that time or since that time.) See abstract of Marquardt's presentation, enclosed as Exhibit D. Further, at Marquardt's invitation, representatives of major producers and distributors of kidney dialysis machines and artificial kidneys, including Travenol Laboratories, visited Marquardt to review the company's development program. To Marquardt's knowledge, no one other than themselves elected to undertake the development of a workable system based on Marquardt's discovery.

2. At the end of the NIAMD contract, the only real achievement was the determination that zirconium phosphate could effectively bind the ammonium ion derived from urea by application of urease. Although this discovery showed great promise for the development of an improved artificial kidney system, Marquardt and the Government knew that it was still quite uncertain that it could be sucessfully developed, using the invention.

3. Marquardt decided to continue the development of the invention after discontinuance of NIAMD funding in 1968 for two reasons:

a. The company was confident that a workable system based on the sorbent principle could be developed to meet a critical need.

b. There were continued indications by the Government of the possibility of awarding Marquardt a limited, exclusive license to provide some degree of assurance of recovery of the company's investment.

I hope that you will take into consideration the waiver experience of existing research and development agencies such as the Department of Health, Education, and Welfare and the National Aeronautics and Space Administration in making your decisions on inclusion of these important clauses.

Sincerely yours,

/s/ Norman J. Latker

Norman J. Latker
Patent Counsel

Enclosure

cc:
Dr. Betsy Ancker-Johnson (With enclosure)
Chairman, Committee on
Government Patent Policy
Department of Commerce

Mr. James E. Denny (With enclosure)
Assistant General Counsel for Patents
Atomic Energy Commission

Mr. Leonard Rawicz (With enclosure)
Assistant General Counsel
for Patent Matters
National Aeronautics and
Space Administration

DHEW/OS/GCB NJLatker:dyw

btc:
Marantz/Greenbaum file/

In retrospect, it now appears that its decision was proper, since we have no knowledge that Travenol used the period of exclusivity to Marquardt to develop a competing item since Travenol has not approached us for an nonexclusive license to enable them to enter into competition with Marquardt after the period of exclusivity ended. Travenol's continued lack of interest in this invention and Marquardt's marketing within the approximate time specified in their development plan, would appear to justify the Department's original decision.

Sincerely yours,

Norman J. Latker
Patent Counsel

2 Attachments

cc: Mr. David Eden

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20201

OFFICE OF THE
GENERAL COUNSEL

December 5, 1975

Mr. James E. Denny
Assistant General Counsel for
Patents
U. S. Energy Research & Development
Administration
Washington, D. C. 20545

Dear Mr. Denny:

It is my understanding that Ms. Irene Till testified before the Interagency panel formed in accord with the Energy Research and Development Act of 1974 for the purpose of hearing public testimony on ERDA's practices under the patent provisions of the Act. In her testimony, Ms. Till made reference to the grant by the Department of Health, Education, and Welfare of an exclusive license to a Department contractor notwithstanding a request from a third party for a non-exclusive license. I understand that the example was cited to illustrate an abuse of the discretionary powers left to the head of an agency under the President's Statement on Patent Policy.

As you will note from the attached February 22, 1974 letter to Congressman Udall, Ms. Till cited this case during the hearings on the Energy Research and Development Act. It is my understanding that Ms. Till also cited this case in arguments presented to a number of Congressmen in order to persuade them to join with Public Citizens Inc. in two cases ultimately brought against GSA to enjoin Government use of two sets of patent regulations. As you know, eleven Congressmen joined in the first suit and seven in the second.

In order to preclude Ms. Till's further trafficking on a distorted interpretion of the facts, I am attaching a copy of the original fifteen page briefing memorandum, supporting the grant of the exclusive license. This document was in Ms. Till's hands prior to her testimony before both the Udall Subcommittee and your Interagency panel.

As will be apparent from the reading of the briefing memorandum, the Department of Health, Education, and Welfare made every effort to gather facts prior to its determination, including giving the public notice of its intentions and the right to object. The determination was primarily based on two briefs from each of the petitioners:

We conclude this section by quoting the common-sense observations of J. G. Chognard in a commentary entitled "Patent Litigation and Validity"[15] which had been engendered by previous Congressional concern over the "high" rate of invalidity of patents in federal courts. The observations are as valid today as they were 15 years ago:

PATENT LITIGATION AND VALIDITY

> The statistical study prepared by Mr. P. J. Federico and presented at the hearings before the Senate Committee on Patents, Trademarks, and Copyrights, 84th Congress, 1st Session (1955) shows that in the 7-year period from 1948 to 1954, 53 percent of all patents which were contested before the district courts were held invalid. *This perfectly normal outcome of litigation* has been analyzed by eminent writers who have ascribed it to various causes ranging from an anti-patent attitude on the part of the judges to sheer incompetence on the part of the Patent Office. Mr. Arthur M. Smith's recent article adds the thought that patent solicitors are also at fault.
>
> *Patent litigation is not something people engage in as a hobby.* The validity of a patent is not generally adjudicated unless it is doubtful enough for competent counsel on either side to reach opposite conclusions. *We can therefore expect that 50 percent of the patents be held invalid in the district courts.* The fact that the actual percentage is 53 percent instead of 50 percent does not justify the flood of criticism and self-criticism that has followed.

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15 Published in 41 JPOS 291 (1959).

the Courts of Appeal in the period 1940-1971,[11] *may* be adequate for determining the characteristics of the population or universe of patents as a whole within statistically acceptable confidence limits,[12] depending on the nature of that population. We emphasize, however, that *that sample must be unbiased, perferably randomly drawn across the entire population.*

It is precisely here that we feel the statistical process involved in the present analysis breaks down. There is no basis for concluding that the 1080 or 2149 patents adjudicated (about 0.1-0.2% of the patent universe) would have the same distribution of validity as those that are not adjudicated (about 99.8-99.9% of the patent universe) because there is no evidence or reason to believe that the selection process by which the 1080 or 2149 patents reached the Courts of Appeal is *random* or *unbiased* in a statistical sense. No

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[11] During which time (1940-1971), we have earlier concluded 60-70% of those patents were held invalid.

[12] Experience indicates the validity of this statement. We make reference to the Nielsen, Harris, or Gallup Polls wherein 1000-1500 of the population is interviewed, from which conclusions are extrapolated as to the thoughts, opinions or other characteristics of the entire U.S. population. On the other hand, pollsters are sometimes wrong, often because they fail to take into account that the question being asked of the sample is capable of evoking a widespread range of answers, not a simple "yes" or "no" answer. The pollster should increase his sample size accordingly in such a situation to reduce possiblity of error in extrapolating the sampled conclusions to the entire population.

Getting back to the statistics themselves, I hope I don't shock you too much by saying the statistics don't shock me. There are a lot of good reasons for this, but in any event, it appears that the trend has been reversed, so perhaps the shock question is a moot one:

The sample is too small;

Many patents *are* invalid;

The case on behalf of the patentee may not have been properly presented;

The accused infringer may have found and presented evidence of invalidity not considered by the Patent Office;

The patents held invalid tell nothing about the patents not litigated, but licensed or otherwise respected;

Changes in economic conditions and business practices undoubtedly influence decisions as to whether to litigate or license;

Most of the statistics are drawn from reported opinions, while it is recognized that unreported decisions show a considerably lower percentage of invalidity, and there seem to be no statistics on cases settled by stipulation;[10]

and

Finally -- and this may be the most important factor of all --

The Declaratory Judgment Act was passed in 1934 -- prior to that time only the patentee could bring the patent before a court for adjudication,

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10 The two Patent Office studies, fn. 4 *supra*, confirm that unreported decisions show a considerably lower percentage of validity (see fn. to the summary of the August 31 study, reproduced earlier herein), and provide some statistics on consent judgments. See also Federico, fn. 2, *supra*.

can be calculated from the data presented in Table 11 of Federico, appendix 1, that 3,240 patents were adjudicated in Courts of Appeal during 1925-1952. From the additional data that some 1,110,000 reissue and utility patents issued between 1925 and 1952, it can further be calculated that the patents adjudicated in the 1925-1952 period represent about 0.3% of the utility and reissue patents actually issued during that period. Over the entire period 1925-1971, about 0.2% of the utility and reissue patents issued in those years were adjudicated in the Courts of Appeal.

It is in the above context that the comments of several authors on the question presented in the heading of this section should be considered. C. Marshall Dann[7] has stated:

> "Meaning of Statistics
> "Can it be inferred from these statistics [such as those presented in section one of this report] that as of 1961 approximately 35 percent of the patents in force would be upheld if litigated [or conversely, that 65% would be invalidated if litigated]? *The best answer would seem to be that the evidence is too meager to justify such an inference.* It has been argued that the proportion of all patents which are valid is considerably higher than in the case of the adjudicated patents, since strong patents are respected and only the weak or borderline patents are contested by infringers. On the other hand,

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[7] "Adjudication of Patents Under the 1952 Act," Encyclopedia of Patent Practice and Invention Management," R. Calvert Ed. (1964), pp. 20-22.

The above table shows that, of the total 190 patents held invalid by the Courts of Appeal, 30 represented a reversal of an earlier District Court judgment of validity. The Courts of Appeal affirmed the District Court judgment of invalidity with respect to 160 patents, thus agreeing with the District Court judgment in 84% of the total of 190 patents ultimately held invalid. Similarly, of the total of 81 patents held valid by the Courts of Appeal, 24 represented a reversal of an earlier District Court judgment of invalidity. The Courts of Appeal affirmed the District Court judgment of validity with respect to 57 patents, thus agreeing with the District Court judgment in 70% of the total of 81 patents ultimately held valid. Evident on its face from the above table (and the preceding table taken from the August 31, 1973, Patent Office study) is the fact that more District Court judgments of *in*validity than judgments of validity were appealed to the Courts of Appeal. That fact further supports the view that the mere statistic of 70% invalidity of patents in the Courts of Appeal is not representative of results to be expected in validity litigation in general.

In summarizing, the results of its study, which involved examination of notices received from clerks of courts under 35 U.S.C. 290 as well as reported decisions, the Patent Office concluded:

> The Patent Office views this study as far more comprehensive and accurate -- particularly for the time span considered -- than any studies heretofore undertaken which have examined merely, for the most part, reported decisions of the Courts of Appeals. Those previous studies are included as a bibliography to this study. [The same studies appear in fn. 2 and 3, *supra*.]
>
> It is to be noted that the percentage of litigated patents held invalid by the Courts of Appeals (70%) in the five-year period 1968-1972 covered by this study corresponds closely to the invalidity percentages found by the other authors mentioned in the bibliography for the period 1940-1972. However, the inclusion in this study of unappealed and unreported judgments of the District Courts* to obtain a resultant total rate of patent validity of approximately 50% places the entire litigated patent validity/invalidity picture in proper perspective.

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* The Patent Office received no §290 notice of a Court of Appeals or Court of Claims decision that was not reported. It was found, however, that of the 368 patents held valid, about 181 (approximately 50%) were the subject of unreported District Court decisions. Similarly, of the 357 patents held invalid, 28 (approximately 8%) were the subject of unreported District Court decisions.

The following table appearing in the "Further Studies on Patent Validity/Invalidity on a Circuit-by-Circuit Basis, 1968-1972" (published February 14, 1974, in the BNA Patent, Trademark and Copyright Journal) is also of interest with respect to the question posed in the heading of this section:

II. Is the figure of about 70% invalidity representative of results of patent litigation in the federal court system in general?

At this juncture, it seems appropriate to ask whether the 70% invalidity figure derived solely from examination of *reported* decisions relating to patent litigation in the Courts of Appeal is fairly representative of results in *inter partes* patent litigation in the entire judicial system. The results of the two recent Patent Office studies earlier noted, fn. 4 *supra*, indicate that the 70% invalidity statistic is not representative of final judgments of validity or invalidity rendered by the judicial system as a whole. Illustrative is the following table appearing as part of the Patent Office study dated August 31, 1973, and reprinted in the BNA Patent, Trademark and Copyright Journal of September 13, 1973:

period 1953 to 1972. It should be noted that the line graphs of % invalidity change erratically from year to year no doubt due to the relatively small number of adjudications each year. Nevertheless, the graphs do follow rather similar patterns. All studies, with the exception of Gausewitz, indicate that the holdings of invalidity by the circuit courts appear to fall generally within the 60-70% range. Tegtmeyer, for example, reports an average invalidity of 66% for 864 patents over the period 1953-1968. Dearborn reports an average invalidity of 57.4% for 734 patents over the period 1953-1963. Moxon reports an average invalidity of 67-68% for 284 patents during the period 1967-1972.[4] Horn et al. report an average invalidity of 64% for 579 patents over the period 1961-1970. Koenig reports an average 70% invalidity over 1953-1957; 58% over 1958-1962; 68% over 1963-1967; and a 15-year average of 65.4% for 854 patents.

Two conclusions emerge from the sum total of the above studies, including that of Federico.

(1) Patents have not been invalidated by the Courts of Appeal at any substantially greater rate in recent years

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[4] The recent, comprehensive Patent Office studies of court determinations of validity/invalidity, published on September 13, 1973, and February 14, 1974, in the BNA Patent, Trademark and Copyright Journal, confirm that 70% of patents litigated in the Courts of Appeal were held invalid during 1968-1972, inclusive.

INVALIDITY STUDIES BASED ON COURTS OF APPEAL DECISIONS

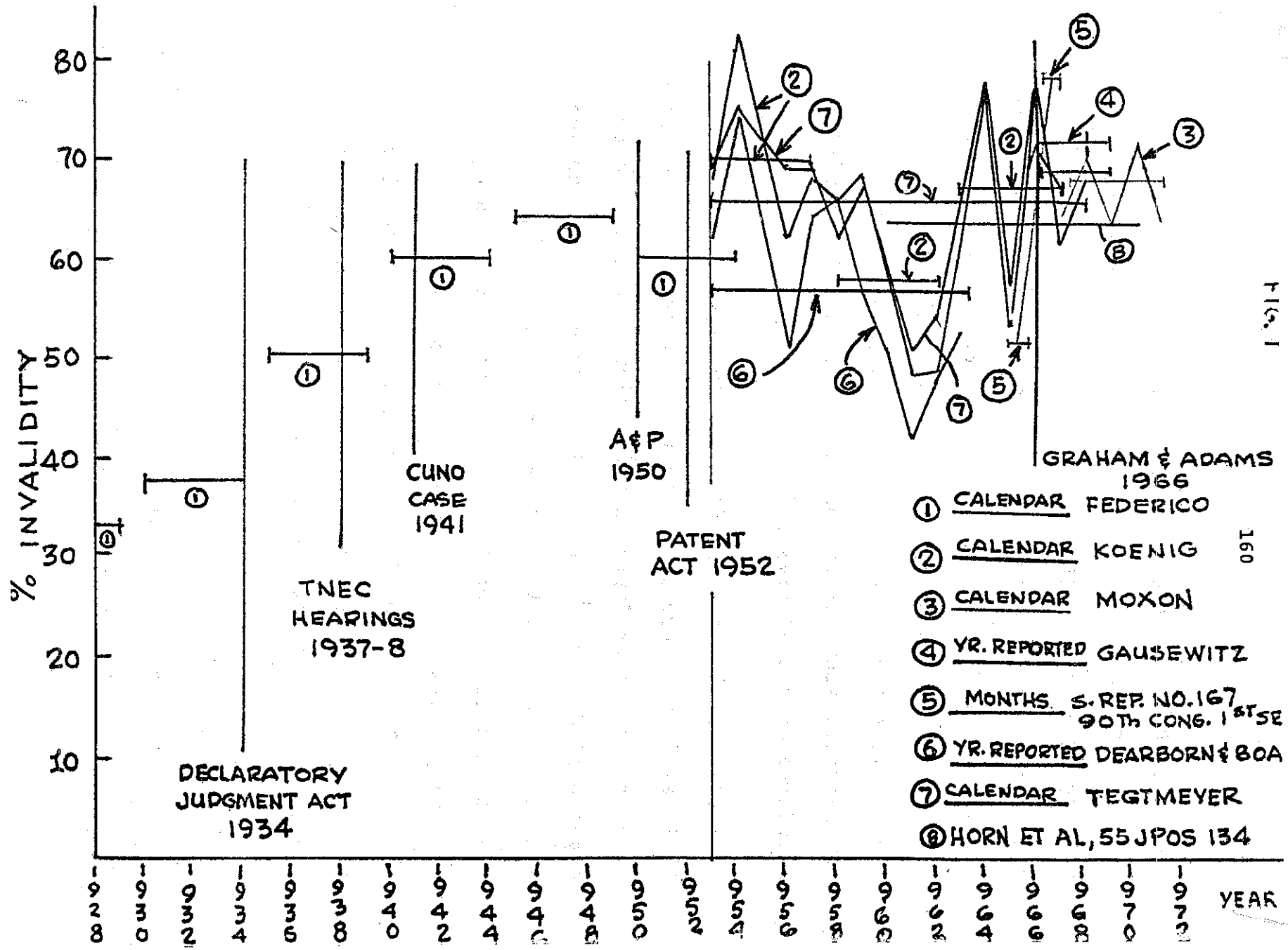

FIG. 1

Several questions are presented by the premises advanced by the Supreme Court and respective legislators:

I. Is the ubiquitous figure of 72% patent invalidity in Federal Courts of Appeal accurate?

II. If so, is that statistic representative of results of patent litigation in the federal court system in general?

III. Can the statistic of 72% patent invalidity in Federal Courts of Appeal (or whatever statistic is accurate) be extrapolated to, or be regarded as representative of, the patent universe as a whole?

IV. On what bases are patents being held invalid in the federal courts?

V. What evidence exists to support the conclusion of the Supreme Court in *Graham* that there exists "a notorious difference between the standards applied by the Patent Office and by the courts" in determining patentability?

I. Are patents being held invalid at a rate of 72% in the Federal Courts of Appeal?

Turning first to question I, the source of the 72% invalidity statistic appears to be Gausewitz, "Brief in

As recently reported,[1] certain members of Congress, proceeding under the assumption *inter alia* that 72% of the patents litigated in Federal Courts of Appeal are held invalid, have introduced legislation designed in part to overcome that situation.

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[1] In introducing S. 1321, Patent Reform Act of 1973, on March 22, 1973, Senator Hart made the following remarks (reprinted in PTC Journal, Bureau of National Affairs, March 22, 1973):

> "Given its intended purpose, the U. S. patent operation cannot be described as a success.
>
> * * * * *
>
> "Worse, patents are being handled by this creaky system in such a way that 72 per cent of those litigated in the Federal Courts of Appeals are held invalid, and fewer than 20 per cent of the litigated patents are upheld as valid and infringed."

Congressman Owens, in introducing a similar bill in the House on April 17, 1973, stated in even stronger terms his thoughts on the system (Congressional Record - House, p. 2866, April 17, 1973):

> "The patent system is very sick and perhaps failing, and the results are clear to see. Fully 72 per cent of the patents litigated in the Federal courts of appeals are held invalid, and fewer than 20 per cent of the

U.S. DEPARTMENT OF COMMERCE
Patent Office

Address Only: COMMISSIONER OF PATENTS
Washington, D.C. 20231

Date : April 3, 1974

To : Commissioner C. Marshall Dann

From : Gerald Bjorge and William Beha

Subject: Patent Validity/Invalidity Study

Attached is the final report for Policy Planning Staff Project 73-2, "Patent Invalidity Study." The authors stand ready to answer any questions you may have concerning its contents.

Attachment

I believe that the mission of ERDA in promoting the commercialization of alternate energy sources is best served when technology developed at Government expense is available for use by the public, and not reserved for the sole use of those contractors holding ERDA contracts. Congress, in the Atomic Energy Act and in the Federal Non-Nuclear Energy Research and Development Act, has properly mandated that inventions developed at public expense should belong to the Government. In my considered opinion the purpose of the Government taking title to such inventions is defeated if ERDA adopts a liberal waiver policy.

H. G. Rickover

Encl:
As stated

Copy to:
Dr. Richard Roberts,
Assistant Administrator for Nuclear Energy

The Federal Non-Nuclear Energy Act did not revise the patent requirements of the Atomic Energy Act.

As a result of the Non-Nuclear Energy Act, ERDA issued new Patent Regulations which include the following policy statement, applicable to both the nuclear and non-nuclear fields:

> "While waivers are to be granted only in conformity with the specific minimum considerations and under the carefully delineated conditions set forth in 9-9.109-6, it is recognized that waivers comprise a necessary part of the commercialization incentives available to ERDA. It is intended, therefore, that waivers will be provided in appropriate situations to encourage industrial participation and foster rapid commercial utilization in the overall best interest of the United States and the general public." (emphasis added)

This policy statement and subsequent explanations of the new ERDA patent policy by ERDA staff would appear to encourage a more liberal approach toward the granting of waivers as a method of carrying out ERDA's mission to promote the development of improved energy sources.

In my opinion, ERDA should not encourage waivers of Government patent rights. Waiver authority should be exercised sparingly so that technology developed at Government expense can be made available to all segments of the public and not monopolized by individual contractors.

Some contractors--especially large contractors--and the patent lobby traditionally advocate that contractors should retain exclusive rights to technology developed at Government expense. They argue that without such rights, contractors will not accept Government contracts or be willing to invest the necessary personnel and other resources to do Government work. They contend that few Government-owned inventions are used in comparison to privately-owned inventions, and that granting exclusive rights to contractors will encourage private investment, speed up commercialization, enhance competition, and encourage maximum industrial participation.

I believe these arguments are invalid for the following reasons:

a. The opportunity to make a profit, and to develop at Government expense additional technological capabilities that will better enable them to obtain future contracts should be

As a result of the license NIH or HEW gave, it increased competition in that particular item 100 percent, by the fact that there are now two suppliers for that instead of one.

I think it is extremely important to be clearly set forth in the record for this group.

(Documents from the DHEW pertaining to this license are included at the end of Ms. Till's testimony.)

CHAIRMAN JOHNSON: Are there any other questions at this time?

We appreciate very much your coming and giving us your views.

Thank you very much.

Would you argue that we have a duty to follow every one of those ideas and develop them? One of our problems -- we have many -- is what to do about by-product inventions that are made that private firms may wish to develop.

What should be our practice with regard to that?

MS. TILL: I guess most of my experience has been with the inventions that have come out of the Department of Agriculture and HEW.

In the field of energy research the problem is, of course, complicated by the fact that giant corporations already sit astride this industry; and it seems to me it will be very difficult to develop any policy granting exclusive rights which won't further strengthen and enhance their position.

CHAIRMAN JOHNSON: Take the developing industry of solar heating and cooling where a large proportion of the firms now competing for business from ERDA are small. What should be our patent approach to those firms?

MS. TILL: You mean small firms are given substantial research contracts; is that what you are saying?

CHAIRMAN JOHNSON: Yes, they are going to be given funds to develop their ideas in the field of solar heating and cooling in a competitive mode. Different ideas are going to be financed at the same time.

What should be our position with regard to patent rights in those companies?

Again, should we distinguish between large companies and small companies, and how would we do that?

MS. TILL: It seems to me that the particular problem you pose is rather unlikely, because our history has been, when you look at the figures on DOD research, that R and D contracts in terms of dollar expenditures -- 99 percent, something like that -- go to large corporations.

I suspect ERDA will have something of the same experience. I hope I am wrong.

CHAIRMAN JOHNSON: I am talking about a program currently underway in which half the money is going to be

MR. EDEN: Is it not true that in the case to which you have made reference the company which applied for the nonexclusive license was the dominant company in the industry?

MS. TILL: I have the impression it is an industry in which there are large and small companies and that the small ones are prospering.

MR. EDEN: Perhaps we can add for the record what the facts were in that case.

(Documents from the DHEW pertaining to this license are included at the end of Ms. Till's testimony.)

But I don't think I have yet gotten a satisfactory answer to my proposal that government-owned patents, which have been available for nonexclusive licensing for a period of two years with no takers, be offered for exclusive licensing on the theory that they are probably useless?

Would you have any objection to an arrangement along those lines?

MS. TILL: Well, I see a problem, really, in such a government R and D policy, particularly where such vast amounts, say, $20 billion, and this will rise to God knows what level -- I see a problem. It means that the government will expend very substantial sums for the initial research and then will turn it over almost invariably to a large corporation for commercial development and exploitation. All of the exclusive licenses that have been asked for in the Department of Agriculture were by very large firms, Upjohn, and so on.

The net effect of that policy is really a kind of subsidization of the research of very large firms, because they become the inheritors. And this is a very bad policy, it seems to me, if we do wish to maintain a competitive economy in this country.

MR. EDEN: Let me try rephrasing the question.

We have a situation presently where there exist 26,000 government-owned patents. 95 percent of them are not being used, to the best of our information.

But that is the policy which you are advocating across the board for ERDA and other agencies?

MS. TILL: You say he will be here this afternoon?

MR. EDEN: No, I say I hope he will. I have the same problem with the quotations you have taken from Senator McClellan and Professor Barber.

Have you done any investigation on your own to verify the statement that about 72 percent of the challenged patents are ultimately declared invalid by the courts?

MS. TILL: Well, Senator McClellan, whom we can presume is a reasonably honest man, said that his staff had made such an examination.

MR. EDEN: I believe that Senator McClellan was referring solely to cases which reached the Courts of Appeals. If one examines the totality of litigated cases, including those which terminate in the lower courts, one finds that approximately 50 percent of challenged patents are held valid and 50 percent invalid. Under the circumstances, it may be preferable if I undertake to supply copies of the source materials which I have in mind for inclusion in the record of these proceedings.

(Patent Office Patent Validity/Invalidity Study is included at the end of Ms. Till's testimony.)

You have expressed a personal preference that the government license its patents on a nonexclusive basis.

What percentage of the patents presently available for licensing on that basis are actually being utilized by industry?

MS. TILL: I am sorry.

I would expect Mr. Denny might be able to answer that.

MR. EDEN: I'm sure he would, also.

The difficulty may reside in your not appreciating how low the percentage really is.

MS. TILL: The previous speaker from M.I.T., I think, said that there are many suggested inventions which actually do not turn out to be commercially successful.

position and has he put in a lot of money in advance, or is it an entirely virgin field? Does it involve, say, the health of the general public?

There are all kinds of aspects to be taken into account.

So to answer quickly and to the point, I think, would be very difficult.

CHAIRMAN JOHNSON: Mr. Denny.

MR. DENNY: I am glad to hear you make those statements because those are some of the considerations that are in our Act that we have been asked to look at in such situations.

You have quoted Admiral Rickover here.

I have noticed the inclusion of such statements "where the government money is used to develop"; "where the government is fully paying for the invention"; leaving the question perhaps open to whether there is cost-sharing.

I would like to ask you to comment on something that is quite frequently stated in the compulsory licensing area.

It has been stated that if you eliminate the patent system altogether, or if you require compulsory licensing across the board, that your larger firms would be in a much preferable position in order to commercialize technology because of their superior marketing power.

Would you comment on that, please?

MS. TILL: Well, it seems obvious to me that if a development is going to be made available on an exclusive basis only to those who can afford to put the money into it (and as was pointed out this morning, in some cases that may be a rather substantial amount), then it seems to me again that what our government policy amounts to is financing the initial work, perhaps some of the hard, dirty, innovative work, and then turning over that as a gift to large corporations, strengthening their private position in the marketplace.

It seems to me this policy has a very devastating effect upon our whole notion of a competitive economy.

in the hands of private companies—the Authority's task would be to stimulate exploitation through all manner of affirmative actions.

Since 1948 an agency of this type has existed in Great Britain—where it bears the title of the National Research Development Corporation and has as its chief statutory function "the development or exploitation of inventions resulting from public research." It has had its greatest success in respect to the computer industry, which it actually brought into being. But it has also played a significant role in the commercial development of drugs originating in the British universities, not to mention a number of mundane products. The corporation continues to support development work on a new type of cathode tube for color TV and on the Hovercraft. A portion of its operating budget has been covered through the royalties it has collected for the licensing of several patents under its jurisdiction.

Besides accomplishing quicker and fuller development of our now largely unused but taxpayer-sponsored inventions, an Inventions Development Authority could charge royalties for licensing its patents (only, of course, if the United States were to take title to such inventions, as I believe it should). This might well generate a sizable amount of revenue, sufficient to, at least, in part defray some of the heavy cost of our $15 billion a year research effort. The British Government, for example, made a very substantial gain on the royalties it collected from the licensing of the Viscount patents. The possible American parallels are obvious.

More importantly, by diffusing widely the knowledge now locked up in the vaults of a relatively few corporations an Inventions Development Authority could tend to mitigate the trend to concentration now discernible in Government research. By involving more participants in the exploitation of the most revolutionary types of scientific information we could broaden our base of Government contracting and open up the markets of tomorrow to large numbers of business firms, big and small, situated throughout the Nation, rather than permit them to be dominated by the few favored giants who presently do most of our research and development.

By taking title to patents where its resources represent the primary contribution and by establishing a new independent agency to exploit the technical information and inventions generated by federally financed scientific programs the Government, meaning essentially the Congress since legislation will be necessary, could insure that the fruits of our $15 billion a year in research expenditures inure to the benefit of the general public.

○

the inventions made with Government research funds are lying dormant. If this situation is to be corrected, two steps must be taken: (1) the Government must retain title to all inventions which arise out of research it has financed; and (2) a new agency must be created—an Inventions Development Authority—and charged with developing these inventions and the related information as promptly and as comprehensively as possible.

A few data will suggest the extent to which new inventions, originating in Federal research programs, are presently simply collecting dust. Between 1946 and 1959, according to the 1960 patent foundation study, about 32,000 patents were issued on inventions originating in federally financed research, largely through expenditures of the Department of Defense. Title to 23,000 of these patents was assigned to their private developers; the AEC acquired an estimated 2,500 of the patents; most of the remaining patents were obtained by Government agencies (including DOD, which, as of 1959, owned some 5,500 patents).

Yet, of the sizable number of inventions that have been made as a result of Government research since the end of World War II, a disappointing proportion has actually been put to use. Of privately owned patents pertaining to inventions falling in this category only 13 percent have even been licensed. The AEC, which has more than 2,500 patents in its inventory, has done somewhat better—issuing licenses on more than half (still, though, this is beneath the 55–65 percent utilization rate which is applicable in the case of privately developed and owned inventions). As for patents held by the Defense Department the rate of licensing is unknown, but presumably it is also low, well beneath 50 percent. Data of this sort, of course, are subject to various distortions: for one thing DOD's patent portfolio, at least as it respects inventions made by private contractors, is likely to be of poor quality or otherwise the companies concerned would have taken out the patents themselves; for another, many Government-owned patents are used with impunity and without license application since the Government has a policy of not suing for infringement; as well, many of the products and discoveries made in the performance of space and defense related research are not easily put to use in commercial markets—they may require additional research and modification before they can be adapted to civilian pursuits. Nevertheless, these statistics are suggestive and support the conclusion that most of the inventions stemming from Government research remain unutilized—they represent little more than ideas which are filed away in the recesses of private concerns and Government agencies.

If this steady flow of scientific information and inventions is to be put to use, it will require an entirely new institutional arrangement. At the present time there is simply no organization, in or out of Government, whose principal job it is to collect, analyze, disseminate, and exploit the multitude of discoveries emanating from the Government's truly massive and unprecedented research effort. Those agencies spending most of the research money, namely the Defense Department and NASA, are entirely concerned with accomplishing their primary missions of national security and space exploration. Whether one agrees with their point of view or not is unimportant—the fact is that neither of these organizations has or will devote any

are obvious: The Government pays the costs, so there is no significant risk of loss, and, if a discovery is made—if a new product or process is perfected, the firm will have an "inside track" for follow-on production awards in the military areas and for later commercial exploitation. Indeed, most firms are so anxious to obtain research work that they originate a large portion of all experimental projects; they, not the Government, submit proposals. This, I think, is an index of their intense interest in R. & D. contracts—something which a shift from a license to a title policy is very unlikely to moderate and which will exert a powerful constraint against cost increases.

Yet even if there were some increase in R. & D. costs as a consequence of adopting the title policy, it would be worth it. We are now paying a heavy price through the waste inherent in not making full use of the scientific information that has been accumulated through past Government-financed R. & D. projects. Besides, by permitting development to take place under monopolistic conditions a higher total cost results. Finally, if it were to hold the title to patents, the Government would be in a position to seek royalties in certain cases and recover some portion of our heavy research outlays. The United Kingdom, as an instance, recovered several times over its initial investment in the construction of a prototype for the Viscount plane.

In the last analysis, taking into account all factors, any attempt to calculate, let alone predict, whether a uniform patent title policy would reduce or increase costs is fraught with the utmost difficulty. Certainly, though, the evidence is not such as to warrant deciding against such a change in policy on this basis. And since on other grounds a title approach seems to have considerable advantages, the change properly should be made.

CONCLUSION

The ease for the Government's retention of the title to inventions arising in the course of taxpayer-financed research is overwhelmingly persuasive. By keeping the title to these inventions (and note that my emphasis here is on keeping the rights which the law says the Government possesses, absent a giveaway contract provision to the contrary) the Government would be putting itself in a position where the pertinent discoveries and related technical knowledge could be expeditiously put to the good of the society at large. Giving the title away, aside from cases where the contractor has made the primary contribution, impedes the diffusion of knowledge, hampers development, and permits the titleholder to levy a toll on the public for using an invention which they have already financed. Retention of title is not in itself enough, as I point out in the next section, but it does permit the Government to go about the job of development and patent exploitation in a manner consistent with its obligation to the public.

In the face of this conclusion, I am naturally disturbed and shocked at NASA's announcement that it will shift over to DOD's patent giveaway. Such a change in policy is, in my judgment, unwise, inconsistent with the apparent legislative intent, and contrary to the public interest.

In adopting the National Aeronautics and Space Act of 1958 Congress seemingly wished to create a presumption in favor of the Gov-

The history of inventions is replete with instances where competition has stimulated the development of inventions. Take the case of the catalytic cracking of petroleum. Here the major pioneering work was accomplished during the 1920's by a Frenchman, Eugene Houdry, who solved the critical problem of regenerating the catalyst as well as discovering new and better catalytic agents. Houdry offered to sell his process to the Anglo-Iranian Oil Co., but they were not interested. Fortunately, however, other concerns were willing to make investments with a view to development—a fine demonstration of the advantages of having a number of participants. In 1930 the Vacuum Oil Co. organized, with Houdry, the Houdry Process Corp. But Vacuum (later Socony-Vacuum) decided finally that the technique had no commercial future. Then the Sun Oil Co. agreed to finance further development and after 2 years and additional experiment at a cost of over $2 million Houdry's method of regenerating the catalyst was perfected. This spurred on other oil companies, most notably Standard of New Jersey and Phillips, to produce still better catalytic cracking methods.

Fluorescent lighting provides another example. In this case General Electric scientists had made important advances in the art in the late 1920's, but the company did not develop them—until, that is, some smaller European corporations had entered the commercial market with fluorescent lamps for general lighting. One could readily cite other similar case instances attesting to the role which competition has played as a goad to the development of new discoveries—to mention a few: Synthetic detergents, insulin, the cottonpicker, magnetic recording, shellmolding, xerography, and titanium (with details as to their development available in Jewkes' valuable study, "The Sources of Invention").

Compulsory licensing decrees in patent antitrust cases in the United States also demonstrate the contribution which competitive rather than monopolistic development affords. In 1952, for instance, Du Pont and Imperial Chemical Industries were required by court order to license a key patent in the polythene field. By 1959 Du Pont had issued some 264 licenses. The result has been substantial entry into the polythene and related markets. In the *Besser* case the defendants were found to have conspired to restrain and monopolize trade in the sale of concrete-blockmaking machines. The court required them to license the pertinent patents. Other firms promptly entered the field and an officer of one has made this comment:

> With our innovations in the manufacturing of block machines and our method of operating, it is possible for us to deliver this machine to the blockmaking industry for $32,000 with many improved features, as compared to Besser's price, before the suit, of $53,000. Our cost of this machine is approximately $22,000, which gives us ample profit.

Similar, though perhaps less striking, results have emanated from the licensing decrees in the *Phillips Screw*, *Technicolor*, and *Eastman Kodak* color film processing cases. The lessen is obvious: To gain the fastest, broadest based, and lowest cost development of new discoveries, competition, not monopoly, is the answer. It forces development. By contrast, the monopolist is free to proceed at his own pace (which frequently is lethargic) and on his own terms; he is in a position to levy a toll since he is not subject to the rivalry of other firms.

ANALOGY TO THE ASSIGNMENT OF EMPLOYEE PATENT RIGHTS

In view of the fact that the element of risk in Government research work is absent, there is no compelling reason for permitting private firms to take title to patents on their discoveries—unless, of course, they show that they have actually provided the major contribution. Nor in any other sense would it be "unfair" or "inequitable" if the Government were to take title to these discoveries. Actually, if it were to do so, the Government would only be following the same policies that employers already invoke in the case of their own employees. It is a common practice for a business which is engaged in research to require its scientists to assign to the firm the patents on new inventions which they make or reduce to practice in the course of their employment. Naturally, this makes good sense, from the employer's point of view.

But what is true of the relationship between a private employee and his employer is also true of the Government and its contractors. There is no sound basis for distinguishing between them on the specious though frequently urged ground that a contractor has no assurance of continued work with the Government, whereas an employee is certain of employment with his company. Indeed, I would argue that those research contractors doing the bulk of the Government's exploratory work have an even greater sense of security than do their scientific employees.

Even where there is no contract which explicitly delineates the relative rights of employer and employee in inventions by the latter, the courts over the years have evolved a doctrine that would have the effect of giving the Government the right to patents on inventions made in the performance of research contracts. If one is hired to perform specifically identified research and in the process makes an invention, the Supreme Court has ruled that the inventor may be compelled to turn over his rights to the one for whom he did the work. *Standard Parts Company* v. *Peck*, 264 U.S. 52 (1923). Likewise, in its *Dubilier* decision in 1933, the Court recognized that an employer, Government or otherwise, is entitled to the entire interest, not just a license or right to use without royalty, in any invention made by an employee (which by inference should include a contractor) in fulfillment of a specific research assignment. *United States* v. *Dubilier Condenser Corporation*, 289 U.S. 178 (1933). Suffice it here to say that virtually all Government research contracts mark out clearly the nature of the project; this is essential, for otherwise neither party would know what costs are pertinent to the grant and hence to be reimbursed by the Government. Since the work is thus well defined and one of the goals is to invent, the Government would, under existing judicial precedents, normally be entitled to the patents and other rights in any inventions made during the performance of the contract if it wished to assert its claim. Accordingly, it is a misnomer to speak of the contractor's patent "rights" in inventions which he makes—he has no "rights" absent a contract in which the respective Government agency gives him title to the patent.

The widespread use of contracts by employers requiring their scientists to assign any patents they obtain on inventions made in the course of their work has important implications from the standpoint of creativity. Although corporations are awarded about two-thirds

Government research, even where the immediate purpose of the inquiry is directed to defense or space purposes.

The effects of military and space research hence spill over in all sorts of ways into more traditional commercial areas and it is thus of the greatest importance whether the contractor or the Government holds the title to any inventions which are discovered. If the Government permits the private concern which has done the relevant work at Government expense to take title to the patent, it is just as if we were publicly to finance the creation of monopolies—something which would certainly run counter to our many efforts to promote and preserve competition as the best instrument of economic and social progress. Only if the Government, as trustee for the public, possesses title to the patent will it be in a position to assure that the exploitation of the invention and the related scientific information will take place on terms consistent with the overriding social interests. To the contrary, if title is given to the contractors our efforts to disseminate and exploit the scientific discoveries and inventions emanating from Government research programs will be seriously hampered and the prevailing distribution malapportionment perpetuated.

III. The Case for Government Retention of Patent Title: A Review of the Arguments

The main thrust of my argument to this point has been that all agencies of the Government, including the Defense Department and NASA, should take title to the patents on inventions which are conceived or first reduced to practice in the course of federally financed research (unless the contractor is able to show that he made the primary contribution). As I look at the evidence this approach offers substantial net benefits. Specifically it would put the Government in a position where it could fully and expeditiously exploit the inventions which its funds have produced. However, I feel it is necessary to examine briefly the major arguments of those who would oppose this recommendation and insist that for the Government to take title would dull creativity, be inequitable, impede development, and complicate procurement generally.

The Element of "Risk"

In its usual form those who favor conferring title on the contractor—that is, those who support present DOD policy—rest their case in the traditional arguments employed in support of the patent system generally. Yet close analysis reveals little actual relationship between Government-supported research and unsubsidized scientific exploration.

In theory a patent is conferred on an inventor as a sort of quid pro quo. The process of invention is said to be risky and hence there will be underinvestment unless a special incentive is provided. Traditionally (though this need not be the only form it could assume) this reward has taken the form of the patent, which provides a legal monopoly (for 17 years in the case of product and process inventions, up to 14 years for designs) in return for disclosure of the invention. The hope is that the patent, though admittedly it confers on the grantee a monopoly and thus carries with it the power to make the invention

I see it, our patent policy must, therefore, be so structured as to de-emphasize rather than accentuate the probable consequences of this uneven apportionment. At the moment a small number of giant firms in a few defense and space-related areas, with their facilities located principally in three States, and engaged almost exclusively in the application of existing engineering and physical knowledge to the creation of new products and processes, receive the overwhelming preponderance of the Government's multibillion-dollar research awards. Clearly, if the resulting technical discoveries are permitted to remain within these narrow confines rather than be disseminated widely through the society, a disproportionate amount of the benefits will be channeled into the hands of the few and further economic concentration will take place. A Republican Attorney General, Herbert Brownell, recognized this risk in 1956 when he declared that we must be deeply concerned—

> with the future of competitive enterprise, and it is important that its share of this [research] activity be administered to promote competition * * *. [W]hat indications that are available warn that the Government expenditures may not run counter to the industrial trend toward concentration, but in some degree may actually enforce it. * * * The disproportionate share of total industrial research and development in the largest firms may foreshadow a greater concentration of economic power in the future. * * * [A] present concentration of such manpower and progress means that in the future an increasing share of anticipated improved technologies and new production lines will be introduced by the industrial giants.

Mr. Brownell's concern is well founded. In fiscal 1962, as an instance, 3 firms—General Dynamics, Lockheed, and Boeing—were awarded 25 percent of Defense Department research grants; and the top 10 firms received 56 percent of the total. Not surprisingly, these same firms are found at the top of the list for defense procurement generally (production contracts follow research awards like night follows day). NASA expenditures show the same sort of pattern: in fiscal 1962, 3 companies did 32 percent of its procurement work, the top 10, 54 percent. The following table shows some of the more important relationships between research and procurement activity as it is performed on behalf of DOD and NASA:

TABLE 5.—*Rank of principal contractors in research and procurement for DOD and NASA, fiscal 1962*

Company [1]	Rank among DOD research contractors	Rank among DOD prime contractors	Rank among NASA prime contractors [2]	Rank among Fortune's 500 largest U.S. industrial corporations for 1962
General Dynamics	1	2	7	13
Lockheed	2	1	21	23
Boeing	3	3	13	19
North American	4	4	1	29
General Electric	5	5	10	4
Martin Marietta	6	6	47	32
Western Electric	7	[3] 8	19	[4] 9
Aerojet-General	8	12	4	55
Douglas	9	13	3	58
Sperry Rand	10	9	41	34

[1] Top 10 DOD research contractors listed in rank order.
[2] Includes research awards, which constitute the bulk of NASA procurement.
[3] Included with American Telephone & Telegraph Co.
[4] Rank given is for Western Electric alone. Western Electric is a subsidiary of A.T. & T., the largest utility.

more effectively met. The economic and social problems of the society have been shortchanged in our national research effort.

Fifth, in the few industries that have received the largest chunk of Federal R. & D. money, the biggest companies have got the lion's share. While the largest corporations generally tend to do most of the research (for very obvious reasons: they are the best able to do so from a financial standpoint) actually—and this is surprising to some—the Federal Government has tended to accentuate this pattern. In 1959, for instance, the four largest chemical producers were given 87 percent of the Federal research money spent in that industry, although together they did only 45 percent of the industry's privately financed research; and in 1959, 90 percent of all Federal research funds went to firms with 5,000 or more employees. (See table 4 for further details.) Small business gets even a slimmer share of research money than it does of Government prime contract awards—which means it gets practically nothing. In fiscal 1962 less than 3 percent of defense research awards went to small business.

TABLE 4.—*Percentage of total R. & D. performance funds and total federally financed research and development accounted for by the 4 and 8 companies with the largest dollar volume of R. & D. performance, by industry, 1959*

Industry	Percent of R. & D. performance		Percent of federally financed R. & D.	
	1st 4 companies	1st 8 companies	1st 4 companies	1st 8 companies
Food and kindred products	37	55	(1)	(1)
Textiles and apparel	58	70	(1)	100
Lumber, wood products, and furniture	42	55	(1)	(1)
Paper and allied products	44	58	(1)	(1)
Chemicals and allied products	45	56	86	91
Industrial chemicals	63	79	87	92
Drugs and medicines	45	67	79	94
Other chemicals	28	45	(1)	57
Petroleum refining and extraction	50	73	62	66
Rubber products	85	91	90	99
Stone, clay and glass products	51	70	45	71
Primary metals	44	58	47	73
Primary ferrous products	59	73	(1)	(1)
Nonferrous and other metal products	56	72	(1)	88
Fabricated metal products	48	65	62	89
Machinery	48	58	64	79
Electrical equipment and communication	63	77	64	81
Communication equipment and electronic components	60	77	63	80
Other electrical equipment	89	91	97	98
Motor vehicles and other transportation equipment	90	94	93	98
Aircraft and parts	50	71	51	71
Professional and scientific instruments	62	70	71	81
Scientific and mechanical measuring instruments	76	83	92	95
Optical, surgical, photographic and other instruments	64	79	63	81
Other manufacturing industries	60	66	57	60
Nonmanufacturing industries	33	40	69	73

[1] Not available.

Source: National Science Foundation (NSF 62-3). Funds for Research and Development in Industry, 1959, app. A, table A-11, p. 62.

Sixth, there is another sort of serious imbalance that should also be noted—and that concerns the uneven geographic distribution of research awards. A few sections of the country receive most of the Government's research funds, as is well documented in a special report issued in 1962 by the Department of Defense based on fiscal 1961

Within the Federal sector, two agencies, DOD and NASA, together account for nearly 80 percent of the Government's research effort. The 1964 budget projects research expenditures by the Defense Department of $7.7 billion (the Department is seeking new obligational authority of $8 billion, with most of this to be spent in future years) and by NASA of $4.2 billion (it is asking new authority to obligate $5.7 billion). Unquestionably, of these two agencies NASA is growing the fastest: In fiscal 1961, for instance, it spent only about $744 million for research, but in 1964 it will spend $4.2 billion—which means that within only 4 years its research operations have increased sixfold. In fiscal 1964 NASA expenditures will amount to more than a quarter of total Federal research outlays, as the following table shows:

TABLE 2.—*Federal research expenditures: Role of DOD and NASA*

[Dollar amounts in millions]

Fiscal year	Total Federal R. & D. expenditures	NASA expenditures	NASA percent of total	DOD expenditures	DOD percent of total
1961 actual	$9,291	$744	8	$6,582	71
1962 actual	10,348	1,257	12	6,781	65
1963 estimated	12,240	2,400	20	7,089	58
1964 estimated	14,933	4,200	28	7,653	51

Thus, the administration of NASA patent policies is of large and increasing public concern.

Several other characteristics of our Federal research programs, however, must be kept in mind in any enlightened appraisal of their aggregate effects. What they add up to is a case of extremely uneven distribution, threatening to bring about a substantial readjustment of our economic and social order. Let me briefly note a few of the chief features:

First, in its research undertakings the Government relies on authoritative decision and negotiation rather than the usual market process to determine the extent and manner of allocation. This is reflected in the fact that in fiscal 1962, 97 percent of DOD research awards were made on a nonprice, noncompetitive basis. Here, as in the case generally of defense procurement, we depart from the kind of automatic allocative mechanism that we otherwise depend on to fulfill our economic goals. This means that we must make ourselves aware of the character of our research operations, constantly appraise the probable effects, and make appropriate adjustments in policy. We cannot expect desirable results if in the research area we follow the dictates of laissez-faire.

Second, the great bulk of the Government's attention is concentrated on applied research and on development, with very little interest displayed in basic research. And since in private industry there is also no significant attention given to the acquisition of basic scientific knowledge (in 1961–62 only about 7 percent of industry research expenditures went for basic research, and only about 10 percent if all sources are included), this crucial facet of technological inquiry receives disturbingly little study.

To correct this imbalance the President outlined several new approaches worthy of careful legislative consideration. Among other things, he would establish regional centers for the dissemination of scientific information, modeled along the lines of the Agriculture Department's highly successful Extension Service. This is a highly laudable proposal, though it doesn't go nearly far enough, as later discussion here indicates. But even if the President's new programs for diffusing the tons of technical knowledge that are flowing from the Government's billion-dollar research assault were largely effective, these benefits, I suggest, would be far more than counteracted by the adverse results of NASA's plan to join in the Defense Department's patent giveaway. As I see it, the Defense Department and NASA are working at cross-purposes with the Chief Executive.

In my opinion two steps should promptly be taken to insure that our $15 billion a year in federally endowed research programs function in a manner fully consistent with the public interest:

(1) All agencies and departments of the Federal Government should be required to take title to the patents on all inventions which arise out of or are first reduced to practice in the course of Government-financed R. & D., unless the contractor can establish that he made the primary contribution to the patentable invention. To me this makes just plain good sense: the public should get what it pays for, and normally this will incorporate taking title to patents stemming from Government research. Indeed, most companies require their scientists to assign over the patent rights to any inventions which they make during their employment—a procedure which they reject when the Government is paying the bill. Based on the available evidence, a change to the title policy, though it would be greeted with strident shouts of protest from those who have a strong vested interest in perpetuation of the existing bonanza, would have few, if any, unfavorable effects. But it would stimulate use of new scientific discoveries, making them available more quickly and at lower cost than if the contractor is allowed to seize the exclusive right to supply the product in commercial markets. It should not be overlooked that a patent confers a monopoly—and generally this means that where development and exploitation of the pertinent invention occurs it is likely to be slower, more limited, and result in higher prices than would prevail if development were to occur under less restricted (nonmonopolistic) circumstances.

(2) To exploit the vast hordes of technical information which our gargantuan R. & D. effort is generating, a new independent Government agency should be created—an Inventions Development Authority—to have as its major functions the collection of scientific information, its analysis, and its development, including the collection of royalties on Government-owned patents where appropriate. Without such an agency the locus of the title to patents will only have met one aspect of the overall problem. All too often now the question is simply whether a patent collects dust in the file drawers of the contractor or the pertinent Government agency (one recent study found that only about 13 percent of privately owned patents stemming from federally financed R. & D. had ever been licensed for use). To use this information for the good of the public demands the creation of an agency which is charged specifically with the task of exploiting patented ideas fathered by Government research.

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ECONOMIC AND LEGAL PROBLEMS OF GOVERNMENT PATENT POLICIES

Prepared by Prof. Richard J. Barber

Each year the Federal Government now spends more for research and development (R. & D.) than it did in all the years from the time of the Revolution through the end of World War II. Indeed we now spend more for this purpose in a single day—a daily average of $35 million in fiscal 1963, $41 million in fiscal 1964—than we did in any one year before the World War II military buildup commenced.

But never, I submit, has so much money been spent by the Government with so little consideration for its ultimate social and economic consequences. We have launched a truly massive research effort that literally has grown like Topsy. In the fiscal year 1964 it will consume $15 billion. We have taken long strides in our $20 billion effort to reach the moon and we have recorded many distinct scientific accomplishments. Yet our institutional arrangements for processing and exploiting the resulting flows of technical information are still of 19th century vintage. Billions of dollars go for research but mere fractions of mills for putting the product of this large scale inquiry to the good of the society at large.

Most of the scientific knowledge being generated through the Government's research effort is being locked up in the hands of the few—benefiting almost exclusively the giant corporations that receive the bulk of the funds and the relatively limited geographic areas in which they have their principal facilities. Other companies—usually the smaller ones—and other industries which might put this new knowledge to good use, perhaps in unforeseeable as well as entirely expected ways, are effectively denied the requisite information. Even worse, many of the discoveries that are being made each day—the major as well as the minor—are not being exploited by anyone, including their corporate and governmental parents. Through sheer lack of attention we have permitted key Government departments to adopt patent policies that permit corporate recipients to seize control of inventions that have been made with public funds. And we have failed to set up an effective institutional arrangement that could efficiently diffuse the product of the Government's $15 billion a year research effort throughout the society—to all companies, in all industries, wherever located.

The Department of Defense (DOD) and the National Aeronautics and Space Administration (NASA) have kept their large eyes fixed firmly on what really are short-run, albeit important, targets connected with national security and the exploitation of outer space. But their gaze—and they account for about 80 percent of Federal R. & D. expenditures—has been exceedingly myopic; in their all-out efforts they have manifested little regard for the total implications of

FOREWORD

The following study prepared by Richard J. Barber, assistant professor of law at Southern Methodist University, deals with some of the economic, political, and legal implications of the patent policies of the Federal Government.

Before World War II, research and development expenditures were small, and originated chiefly in the private sector of the economy. Although the Federal Government sponsored and conducted research, its contribution, which was not very significant, was confined to laboratories in the Departments of Agriculture, War, and Navy.

The Federal Government obligated about $14.5 billion on research and development for 1963, which will constitute from 65 to 70 percent of all funds spent in the Nation on these activities. In addition, the trend toward a higher Government ratio is expected to continue.

During the thirties, most of the Government's research was performed in its own laboratories; today over 30 percent of Government research is performed by private laboratories. During the past two decades, then, funding by the private sector has been increasingly displaced by the public sector, while performance with public funds has shifted from the public sector to the private sector.

A large proportion of these funds are being used to create and support firms and industries, which thus owe their very existence and survival to the Government. In 1960 Government research funds accounted for 89 percent of the research and development in the aircraft and missiles industry, 67 percent in the electrical and communications industry, 51 percent in the scientific instruments industry, and significant percentages in machinery, rubber products, and other industries. Considerable know-how and technical backgrounds have been acquired at public expense. It is not surprising that a high degree of correlation exists between those industries heavily dependent upon Government research and the amount of scientific personnel employed in the industries. This is in conflict with our view that industries will risk venture capital, and, if successful, move ahead in a competitive marketplace.

Having been created and sustained by the Government, many pseudoprivate firms, without taking the risks of truly private enterprise, want to be considered as genuine components of the free, competitive enterprise system, and they invoke the philosophy of the patent system to justify their objectives of securing for themselves the future control of the new science and technology. Nothing less than the future of our free, competitive enterprise system is at stake.

RUSSELL B. LONG,
Chairman, Subcommittee on Monopoly, Select Committee on Small Business, U.S. Senate.

88th Congress
1st Session

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ECONOMIC AND LEGAL PROBLEMS OF GOVERNMENT PATENT POLICIES

REPORT

PREPARED FOR THE

SUBCOMMITTEE ON MONOPOLY

OF THE

SELECT COMMITTEE ON SMALL BUSINESS

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patent which stops the taxpayer himself from using his own resources. Such a situation should not be permitted to occur. It may have been an oversight in the particular contract you mention.

Senator LONG. How can public policy permit any such private patent? Now, Admiral Rickover, your achievements in developing the atomic submarine are rather well known. Have you found that the inability to accord private patent rights to individual contractors has impeded the development of the atomic submarine?

Admiral RICKOVER. Categorically, I say "No." It is the same as the case of the psychiatrists in submarines. Having never heard about this situation, I didn't know there was a problem.

Senator LONG. Where you have a large number of contractors working on parallel projects, would you personally feel that progress would be impeded if each one had the right to take out patent rights and have property rights in the secrets they developed?

Admiral RICKOVER. Yes, sir; I believe there would be. With the system in use in the Atomic Energy Commission all of this information is shared.

Senator LONG. And you have no difficulty in persuading anyone to share what he develops as fast as he finds it?

Admiral RICKOVER. I didn't know until this morning there was any difficulty.

Senator LONG. Do you have any knowledge of problems that exist in any other field outside of your own, where private contractors do not have the right to keep patents?

Admiral RICKOVER. I have heard there are cases in other fields, but to the best of my knowledge, when one attempts to substantiate these cases, they seem to evaporate. In fact, our problem in the atomic energy field is we have too many contractors who want to do work under our patent conditions, and not the other way around.

Senator LONG. So, as far as you are concerned, you have no knowledge of any difficulty in persuading contractors to do the work for you.

Admiral RICKOVER. No, sir. I have difficulty keeping contractors away who are trying to persuade me to give them more work.

Senator LONG. Do you have any questions, Ben?

Mr. GORDON. Senator, I have a question, but I think that you covered it already. But this, perhaps, looks at it in a more general way and I wonder if I could ask it. We have received complaints that the policy of giving away patent monopolies to contractors has a tendency of hampering the dissemination of new scientific and technical knowledge, at least until it can be patented or exploited. What do you think of this? Does the AEC policy prevent this kind of a situation?

Admiral RICKOVER. There is a definite possibility that such a policy can hamper dissemination of scientific and engineering information. The present AEC and NASA policies tend to encourage rapid dissemination of information. This is of great help in developing a new technology. Mind you, we are talking about new technology which it is incumbent on us to develop as rapidly as possible from a national standpoint. We are not discussing the patent situation per se. You and I are not now talking about doing away with our patent system. We are merely discussing whether the Government owns the patents it has paid for. We are only talking about a particular aspect of the patent problem.

standpoint of whether they are aiding or impeding our national progress. Today, there is no essential difference between military and civilian technology. So anything that holds up one, also hurts the other. As I said previously, the patent problem that faces us today was not envisioned by the founders. They lived in a preindustrial society—a society where a patent resulted from the efforts of an individual, not of a large organization.

Senator LONG. Do you have any idea or any judgment as to what, you believe the people at the working level, the actual scientists and engineers, who are doing the technical and developing work, think about this matter and this issue?

Admiral RICKOVER. The men working on a Government project surely know it is the Government that is actually paying their salary. I have never found a lack of desire to do good work, just because it was being done in a Government laboratory instead of a private laboratory, or because the work was being paid for by the Government. When a company hires a man, they pay him for all his talents, including his ability to invent.

Mind you, sir, we must stick to the point; we are not now discussing our patent system; we are only discussing whether the Government should retain rights to patents for which it pays. To the individual scientist or engineer who makes the invention or contributes to it, there is no financial difference anyway. The company gets the patent rights; not he. If he is a good man, if he makes an invention or otherwise makes himself of greater value, he will be promoted and his pay increased whether the company is paying his salary directly, or the Government indirectly.

Senator LONG. As I understand your position, from your last statement, if the Government hired a contractor to develop something for the Government, the contractor, scientists, and engineers are actually working for the Government, notwithstanding the fact that the contractor is interposed between them and their Government.

Admiral RICKOVER. Yes, sir. As far as they are concerned, they do the same in either case, and get the same treatment.

Senator LONG. In other words, if I were a scientist working either for the AEC or a contractor of the AEC, I would be smart enough to know that I am actually working to develop atomic energy for the U.S. Government.

Admiral RICKOVER. Yes, sir. There is an analogy between this situation and the one that obtains in education—one of my favorite subjects, as you know. The National Education Association, a self-admitted lobbying organization, assumes to speak for the teachers. The NEA is constantly saying what they suppose the teachers to be thinking. The teachers rarely speak for themselves. However, I receive many letters from teachers who say: "Please don't quote me; I thoroughly disagree with the NEA, but I am afraid to talk." In the case of patents, everybody is talking for the scientists and engineers except they themselves. The patent lawyers are always telling us what the scientists and engineers think. Now, I happen to deal directly with many scientists and engineers; I have not heard them express the thoughts on patents as espoused by the patent lawyers.

Senator LONG. Would you care to elaborate further on what you do detect the attitude of scientists and engineers to be?

go to a medical society meeting and explain their new procedure so that other doctors might find it advantageous for humanity?

Admiral RICKOVER. Yes, sir. As I said, the medical profession is the most noble and ethical profession. Nearly every doctor is dedicated to improving the health and happiness of all humanity. I believe we could well adopt that same principle in many other fields. We would do well to have our scientists, our engineers, our industrial leaders, our Government servants, and our educationists emulate our doctors.

Furthermore, you must bear in mind we are not talking about the ability of industry to obtain patents when they use their own money. Even in the atomic energy field or in the space field, if you spend your own money you take title to the patent, except for weapons. Last year more than half the patent applications in the atomic energy field were filed by private industry. We should urge industry to spend more of their own money for research and development—in which case the patents will belong to them and they will build up a position of their own.

It may interest you to know that 90 percent of patents for peaceful applications in the atomic energy field are developed by 10 to 11 of the AEC contractors. There have been only three cases where contractors have objected to the AEC patent provisions. These objections were based on the fact that the language of the contract was too all-inclusive; that the language took in more than was required for the actual performance of the contract. These three cases were not important ones. The AEC, I understand, intends to recommend changing the language.

No one has suggested in any instance I know of that industry can't have patents. We must sharpen the problem and point out that the real issue is whether patents, the development of which is paid for by the Government, belong to the people or belong to industry. That is the real issue. We are not discussing the patent system per se.

Furthermore, there is here involved a matter of broad national policy. At present, instead of Congress examining the patent situation, we are permitting each agency to decide for itself. I do not believe Congress should abdicate its constitutional rights and duties and permit any individual agency in the executive branch to set up its own rules which by perpetuation over a period of many years finally assume the force of law and then are used as precedents. The tendency of Government agencies is to let things continue as they are. It is easier for them this way; they don't have to think or to hurt anyone's feelings. It is also easier to have a simple rule such as the Department of Defense has, rather than to judge items on a case basis. I believe the application of our patent law should be considered as a general policy matter for the entire Federal Government; and that Congress should not permit each agency to set up its own rules. That, in effect, is like having several different Federal laws to cover the same subject.

I believe it is in accordance with the intent of the patent law that the Government should own patents resulting from work it has financed. In other words, the Atomic Energy Commission and the National Aeronautics and Space Administration patent rules are in consonance with the law, and not otherwise, as some would suggest.

trained and schooled at Government expense. These are very valuable assets, and the reason so many large corporations vie to obtain these research and development contracts. Now, I can only consider this problem in the light of my own experience. I have never had a single case where the patent provision of the Atomic Energy Act influenced a company not to undertake Government R. & D. work. In fact, many of the very same companies who operate under the Department of Defense patent provisions, which are far more liberal to them than the AEC rules, not only accept research and development work under the Atomic Energy Commission patent rules, but even urge us to give them more such work.

Senator LONG. Do you have any indication that the companies charge you more to do research and development if they are not permitted to keep proprietary or commercial patent rights?

Admiral RICKOVER. No, sir; I know of no such cases. They are nearly all cost-plus type contracts and the fees are about the same throughout the Government. Nor do I agree with the statement frequently made that unless there is such a patent provision, their employees will not work assiduously. I have never seen anything of the sort. A man who has an idea in his mind, if he is worth his salt, will want to get it out. He will fight all obstacles to get it out; it really makes no difference to the scientist or engineer one way or another because the company gets to own the patent rights anyway.

Now, the companies apparently take a different stand toward the Government than they do to their own employees. Their own employees must sign an agreement providing that the company takes title to the patents they develop. Apparently, the companies desire better treatment from the U.S. Government than they accord their own employees.

Senator LONG. I was talking to a young man who worked for an oil company about its research program. He told me that when he went to work for the company, he was required to sign a contract that said that anything he developed would be turned over to the company. Now, he said that he didn't have to sign that contract, but he felt that if he was going to take the job, the company had every right to ask him to sign it. And yet his attitude was that if the company, in turn, was going to work for the U.S. Government on a project to be wholly paid for by the Government, it was no more immoral for the company to be asked to let the Government keep the patent rights than it was for him to be asked to let the company keep the patent rights if he went to work for that oil company.

Admiral RICKOVER. That is tantamount to what I said. I agree with you that companies in the employ of the Government should receive the same treatment from the Government as they give to their own employees. In Great Britain, as you know, there is a different system. There, the patent rights for work financed by the Government belong entirely to the Government; the Government licenses industry and even shares in the royalties industry receives from non-Government applications. In Russia, the Government, of course, owns all patents. So here we have three different patent systems working side by side. I know of no evidence indicating that the British or the Russians are being held back because they have not copied our patent system. One of the reasons the Russians have been able to make rapid progress is because they disseminate technical

tools it has, how it uses these tools, and so on. Where the facilities are owned by the company itself, and where the know-how is its own, the Government shouldn't publish that information. When these conditions obtain, it is possible we have gone too far in making the information public.

Up to the advent of the Atomic Energy Commission in 1946 and the Space Agency in 1958 most research and development consisted essentially of adaptations to existing technology. That is, an industrial organization would be called upon by the Government to take an item it had already developed over a period of many years and change it to a new or improved item for military application. On that basis there was considerable justification for the entrepreneur to maintain his background patent rights; he was merely adding a small novelty to an already existing item. But with the coming of atomic and space science, we have an entirely different situation; we are now dealing with equipment that has never before been used. In fact, most of it was never even conceived of. Consequently, nearly all the money for developing the complete item comes from the Government. I believe in the atomic energy field about 92 percent of the money being spent on research and development is supplied by the Government. It is for this reason I consider the existing patent provisions in the Atomic Energy Act and in the Space Agency Act fair and valid.

Where the Government bears all or nearly all of the cost, where the facilities belong to the Government, and where the Government bears all the risk, the people should own the patents. The American people are spending their money for the research and development; therefore, the patents should belong to them.

Senator LONG. Would that 92 percent be a conservative figure?

Admiral RICKOVER. It probably is. We are dealing with projects and with items that are novel, that have never before been developed. Furthermore, in nearly all cases the patents are being developed in facilities wholly or almost wholly owned by the Government; this is another compelling reason for rights to these patents to inhere in the U.S. Government.

Senator LONG. Admiral, I would like to read to you an excerpt from a speech delivered by a patent attorney:

> * * * may I remind you in the words of our Founding Fathers in the Declaration of Independence that I consider these truths to be self evident: the American patent system is as old as our country, it is the best in the world, it is a fundamental part of our free competitive economy, it has contributed to the highest standard of living in the world, it has helped make America the strongest nation on earth, it will be as vital to our way of life in the age of space as it has been during our first 185 years as a nation, and any proposal which departs from the basic fundamentals of our patent system, no matter how gilded, must be stamped out as a thistle in a wheatfield.

What do you think of this statement?

Admiral RICKOVER. It's a good, ringing Fourth of July speech, Senator Long. It reminds me of an incident that occurred in one of the German States about 150 years ago. As part of a thoroughgoing reform of the judicial system, it was proposed to abolish torture as a means of obtaining confessions from persons accused of crime. A

FOREWORD

For almost 2 years the Subcommittee on Monopoly of the Senate Committee on Small Business has been studying the patent policies of the departments and agencies of the Federal Government and the effect of these policies on our Nation's scientific and economic progress and on the competitive, free enterprise system. Our study culminated in 3 full days of hearings on December 8, 9, and 10, 1959.

Our efforts have revealed that the present patent policies of many of our Government departments and agencies, especially the Department of Defense, have the following effects:

1. The policy of giving away to private firms the patent rights to Government-financed inventions and discoveries tends to erect walls between scientists and to prevent a free interchange of information.

This tends to retard our scientific advance and undermines the very security of our country. The reason rests on the fundamental fact that the diffusion of scientific knowledge throughout our society is a prerequisite for scientific and economic progress and a rise in general productivity.

2. With the present distribution of research facilities in industries, the granting of exclusive commercial rights to private firms doing Government-financed research is giving a major advantage to the larger firms, thus accelerating the pace of economic concentration.

One of the chief arguments advanced for the policy of giving away patent monopolies on publicly financed inventions and discoveries is that if exclusive commercial rights are not given to the contractor, firms would be reluctant to take contracts, scientists would have no incentives to invent and the cost of the contracts to the Government would increase.

To seek further testimony on the validity of these arguments, Adm. Hyman G. Rickover was invited to describe his contract experiences with the Defense and Navy Departments, both of which allow the contractors to retain patent rights, and with the Atomic Energy Commission, which is required by law to take title to all inventions resulting from Government-financed research.

It would not be an overstatement to say that Admiral Rickover, because of his unique and wide experience, has quietly and effectively laid these arguments to rest.

RUSSELL B. LONG,
Chairman, Monopoly Subcommittee,
Select Committee on Small Business, U.S. Senate.

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CONFERENCE

ON

FEDERAL PATENT POLICIES

Senator RUSSELL B. LONG, Chairman,

SUBCOMMITTEE ON MONOPOLY

OF THE

SELECT COMMITTEE ON SMALL BUSINESS

UNITED STATES SENATE

AND

Vice Admiral H. G. RICKOVER

UNITED STATES NAVY

HELD ON

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about the specific language of these two bills. Generally, we prefer the language of section 113 of H.R. 11,856 over that of section 10 of H.R. 11,857. The two provisions are quite similar, with the exception of the reference to the general government-wide patent policy, but there are some language differences we would like to highlight.

Section 113(a)(1), for example, defines the word "information" specifically to include patented or unpatented technological information; it is thus more precise than section 10. Section 113(a)(1) requires dissemination of such information at the earliest "possible" date, rather than the earliest "practicable" date as in section 10.

Second, although we support the intent of subsection (a)(3) of both bills concerning background patents and know-how, we do feel it important that contractors who have invested heavily in given background technology and know-how should not unreasonably be deprived of a fair profit based thereon. If federal taxpayers finance a fundamental advance in energy technology, the general public should not be deprived of access to that advance because of the existence of blocking background technology. Any technological advance of necessity builds upon background technology. On the other

the principles of equity, it appears that the public interest would not be served by such relief. It is true that the right to seek an injunction is not inherent in the American patent system; it was not until 1819 that Congress first provided injunctive relief for patent infringement. 20/ It is further true that over the years the federal courts have developed the principle that injunctive relief under the patent code will not be granted when the injunction would interfere with the health, safety, or welfare of the public. 21/

20/ Act of February 15, 1819, 3 Stat. 481. Cf. Livingston v. Van Ingen, Fed. Cas. No. 8,420 (C.C.D.N.Y. 1811).

21/ Thus, when a patentee sought to enjoin the operation of a municipal sewage treatment plant, monetary relief was approved, but injunctive relief was denied. City of Milwaukee v. Activated Sludge, Inc., 69 F.2d 577 (7th Cir. 1934). The courts have also similarly considered patents for: the irradiation of oleomargarine with ultra-violet light to produce Vitamin D to prevent the disease of rickets (Vitamin Technologists, Inc. v. Wisconsin Alumni Research Foundation, 146 F.2d 941 (9th Cir. 1944)); railroad car hand brakes (Nerney v. New York, N.H. & H.R.R. Co., 83 F.2d 409 (2d Cir. 1936)); firehose couplers (Bliss v. Brooklyn, (Fed. Cas. No. 1544 (C.C.E.D.N.Y. 1871)); and street lamps (Southwestern Brush Electric Light & Power Co. v. Louisiana Electric Light Co., 45 F. 893 (E.D. La. 1891)) -- as falling into the categories of public health, safety, and welfare, thus warranting denial of injunctive relief for patent infringement.

Existing law already attempts to modify the natural incentive of some patentees to limit production in other areas involving patented technology. 18/ Of particular relevance here is section 1498 of the Judicial Code (28 U.S.C. § 1498), which provides, in effect, for a mandatory license whenever a patented invention is used or manufactured by the United States, or used or manufactured for the United States by a contractor. In other words, under existing law there is automatically a mandatory license running to the government, and to its contractors. Under this provision, the government (or its contractors) may not be enjoined from freely using patented technology in private hands if it pays a reasonable royalty or other fair compensation to the private patentee.

This statute was initially enacted in 1910 to permit the government to carry on work related to the public welfare, including of course the national defense and security. Section 1498 is not limited to any specified purpose; it is instead

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18/ E.g., 16 U.S.C. § 831r; 22 U.S.C. § 2356(a); 28 U.S.C. § 1498; 30 U.S.C. § 666; 42 U.S.C. § 1953 (f); 42 U.S.C. § 2183; 50 U.S.C. § 100(b); 50 U.S.C. § 167a(a)(3); 50 U.S.C. § 2473(b)(3).

recommended, in our December letter to the Senate concerning the counterpart bill, adoption of the mandatory licensing provisions expressed in H.R. 11,856. 15/

To summarize the position we have already expressed, we do not believe that adoption of this mandatory licensing provision will have serious adverse effect upon the patent incentive for research, at least none that will exceed that which is necessary to protect the public interest and to achieve the purposes of these proposed energy bills. The Environmental Protection Agency has stated that it found "no cutback in air pollution control research" as a result of section 308. 16/ Most major industrial countries in the world, other than the United States, have general provisions requiring mandatory patent licensing, yet foreign technology (and foreign ownership of United States patents) is growing rapidly.

We also do not believe it will be necessary very often to invoke the provisions of subsection (c). Developers of

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15/ Letter of December 10, 1973, to Senator Henry M. Jackson, Chairman, Senate Committee on Interior and Insular Affairs.

16/ Letter of June 4, 1971, to Senator John Mc Clellan, Chairman, Senate Subcommittee on Patents, Trademarks, and Copyrights.