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ABSTRACT

This document provides a transcript of a paper presented at the Industrial Research Institute Fall 1980 Meeting in Washington, D.C., in which the importance of the industrial research laboratory in cooperative research is reviewed. The role of antitrust policy in corporate decisions to engage in research and development is also discussed, and the "Antitrust Guide Concerning Joint Research Ventures," a government publication, is introduced. This document clearly explains the position of the Department of Justice in providing guidance on collaborative research. Past cases involving joint research are used to illustrate the Department's view that antitrust law and innovation are compatible in most instances. Cooperative research involving both government and industry is also discussed. (CS)

Department of Justice

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INNOVATION AMERICAN-STYLE:

COMPETITION AND COOPERATION IN THE

SEARCH FOR A "BETTER MOUSETRAP"

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Before the

Industrial Research Institute
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Washington, D.C.
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Years before Copernicus published his theory that the Earth revolves around the Sun, Leonardo da Vinci wrote in his note-book, "The sun does not move." 1/ If the renaissance inventor had possessed a team of research scientists to explore his flash of insight, I doubt that Copernicus would be quite so famous today.

Up until the late 19th century and early 20th century, technological innovation came through the discoveries of men and women like da Vinci-- individual inventors who worked alone and in competition with the world. Their brilliance led to startling new inventions. But their isolation and lack of money often led to neglected ideas-- note-books lying in dank cellars unread.

The industrial research laboratory first arose in the German chemical industry during the 1860's and 1870's. Here, Edison's Menlo Park Laboratory, opened in 1876, is credited with being the first major American research establishment. In the early years of the 20th century, General Electric, Du Pont, American Telephone and Telegraph, Westinghouse, and Eastman Kodak opened similar laboratories. 2/

The next forty years saw an enormous growth in industrial research. In 1922, there were only 300 corporate research laboratories in the United States. By 1938, there were 1,769 such labs employing 19,000 workers. 3/ It is not too surprising, then, that 1938 is the year the Industrial Research Institute was founded by Maurice Holland and his colleagues at the National Research Council. Dr. Holland and the fourteen corporations that joined as charter members of IRI knew that industrial research would be the wave of the future. 4/

The birth of corporate research and development has been justly heralded as a major advance in the way innovation is accomplished. But it is important to note that industrial research did not supplant the individual inventor or the university scientist. Rather, it added to the richness and diversity of the American innovation scene. More than perhaps any other nation, we benefit from the competition between various sources of innovation. Even in the 20th Century, the century of organized research by major American corporations, a large number of inventions have come from the individual inventor, the academician, and the small firm struggling to enter a market.

I recite this history, familiar though it may be, because it suggests the theme of my talk with you today. Corporate research laboratories introduced a major new approach to American innovation: a team of scientists, in different technical fields, working on a common mission. It is striking, however, that the corporate research laboratory, a collaborative enterprise, began in industries like electricity and chemicals, where large firms were engaged in fierce competition. A key aspect of this competition was the development of new products and new production methods. That mixture of competition and cooperation is still evident. The spirit of collaboration lives on in joint research between corporations, or among corporations, universities, and Government. Cooperative research, like the individual inventor and the independent corporate research laboratory, has its place in the rich brew of competing American approaches to innovation. The

role of antitrust law is to preserve that diversity -- because history has taught us that competition is the best way to promote innovation.

Antitrust Guide Concerning Joint Research Ventures

This view does not belong only to the Antitrust Division. In his October 31, 1979 Message to Congress on Industrial Innovation, President Carter said that "by spurring competition, antitrust policies can provide a stimulant to the development of innovations." Recognizing the important role that antitrust policy plays in corporate decisions to engage in research and development, the President asked the Department of Justice and Federal Trade Commission to dispel the mistaken view that the antitrust laws prevent most or even all cooperative research activity. The President directed the Department of Justice to provide guidance "clearly explaining its position on collaboration among firms in research." 5/

Today, I am pleased to announce, the Department of Justice has completed its work on an Antitrust Guide Concerning Joint Research Ventures. It is the product, I can assure you, of comprehensive analysis by Division lawyers and review by distinguished antitrust experts, as well as scientists. The Guide will be available through the Government Printing Office in the near future. We hope to arrange, with other Government agencies or private organizations, for wide distribution.

The Guide, like the 1968 Merger Guidelines and the 1977 Antitrust Guide for International Operations, is designed to

clarify our enforcement policy as a way of helping businesses make research decisions. The first major section of the Guide outlines the Division's approach to antitrust analysis of joint research. The analysis is done in three steps: (1) the competitive effects of essential elements, (2) collateral restraints, and (3) access. The Guide gives a rather detailed explanation of these three areas, which factors are to be included, and what weight they are to be given in an individual case.

The second section of the Guide consists of eight illustrative case examples. These case examples pose common problems that arise in analyzing the antitrust implications of joint research projects, and provide our views as to their resolution. One example, for instance, deals with a research and development joint venture by two major firms in a concentrated industry, while another discusses cooperation with a university in conducting an industry "crash" program to develop a replacement for an essential input.

A third section sets out a detailed listing of about twenty business reviews and other clearances of joint research projects that the Antitrust Division has made over the past decade. The twenty actual cases demonstrate that the Antitrust Division is willing and able to deal with real-world research activities.

Antitrust and Innovation

In the time at hand, I of course cannot give you the details of the Guide's analytical framework. But I would like to share with you some observations that underlie my reading of the Guide.

First, innovation covers a broad spectrum of activity. It refers to basic scientific breakthroughs, like discovery of the genetic code of DNA, and basic commercial inventions, such as the silicone chip. The word innovation also describes product improvements, such as the long-playing record or increases in the information storage capacity of silicone chips. The development of new production methods, like use of hot continuous wide strip rolling in the steel industry, is also innovation. Given this wide spectrum of activity, we must be careful in generalizing as to the best conditions for innovation--the optimum industry structure, firm size, or method of organizing research.

Second, innovation is accomplished through a dazzling variety of methods. Virtually every study of innovation I've seen points to major inventions by individual inventors, small firms, medium firms, and large firms. Nylon, the first synthetic fiber, was developed by Du Pont's laboratories during 11 years of intensive work. Du Pont began its efforts in 1927 by setting aside a $250,000 yearly fund and committing itself to fundamental research on polymerisation. 6/ Hot strip rolling, on the other hand, was invented by John B. Tytus while he worked for American Rolling Mill Company and was developed in the plants of Armco, a small steel producer. 7/ The use of a crease-resisting process for fabrics was invented and developed by Tootal Broadhurst Lee Company, Ltd., a medium-sized British firm. The company pursued its research for 14 years-- at a time when no major chemical firm was investing money in solving the fabric creasing problem. 8/

The message, I think, is quite clear: innovation occurs in a diverse economy, an economy characterized by diverse firm sizes, diverse industry structures, and diverse methods of organizing research.

My third observation is that competition is the best way we know to spur innovation. In a competitive environment, businesses have strong incentives to improve their products and their methods of production. Their goal, quite simply, is to make profits. The urge to lower costs or provide a more attractive product-- or even create an entirely new market-- drives businesses to spend money on research and development. And, perhaps as significantly, businesses spend for research because of the risk that competitors, or potential new entrants, will "innovate" a better mousetrap. Examples abound of industries where competition has stimulated technological innovation. Economists point to American aircraft manufacturers in the 1930's, 9/ the aluminum industry after the entry of Reynolds and Kaiser, 10/ the early years of the computer industry 11/ and the recent history of telephone equipment. Indeed, those industries that invest heavily in research and development today--for example, semiconductors, aerospace, and information processing--are most often those with fierce competition.

If joint research and development among competitors became the rule, the commercial incentives for innovation would be significantly reduced. Without the prospect of rewards for achieving innovation, businesses would be less likely to gamble

on inventions. This basic point is illustrated by the agreement to pool air frame design ideas, proposed by aircraft manufacturers and approved by the antitrust authorities in the heat of World War II. After the war, the agreement-- which required manufacturers to share all patents improving air frame design-- led firms to refuse ideas offered by inventors. The manufacturers, with inescapable logic, pointed out that they had no incentive to develop the ideas. Inventors led the effort which resulted in withdrawal of government approval and institution, by the Antitrust Division, of a civil suit to restore competition for air frame design research.

Fourth, there are, of course, situations where cooperation among firms is desirable. Joint research may offer efficiency: lower cost and, through sharing complementary strengths, better results. Moreover, there are times when the alternative to joint research is no research, or research by one firm at a more meager pace. While we continue to believe that independent research in a competitive environment is the best strategy for promoting innovation, there is ample room for joint research.

Fifth, innovation is one of the leading ways to maintain competition. Technological innovation that lowers cost or expands demand for a particular product intensifies price competition. Development of new products can give one firm a major advantage over the other, perhaps transforming their industry in a matter of months. The fear of potential entrants with new ideas can keep established firms from becoming too complacent. In short, Schumpeter

may not have exaggerated greatly when he asserted that the most important competition is "the competition from the new commodity, the new technology, the new source of supply, the new type of organization."

The Department's view that antitrust law and innovation are fully compatible is supported by two recent reports. This year, the National Research Council released a report based on its December 1978 workshop on the impact of antitrust policies and practices on industrial innovation. 12/ The report reflects the views of a distinguished nine-member panel, including seven corporate executives. In essence, they concluded that the antitrust laws, as presently construed by the courts and enforced by the federal government, do not inhibit innovation. What the panel concluded, and rightly so, was that the Justice Department should clarify its position in such areas as joint research and development ventures to dispel uncertainty in the business community. On the issue of innovation and market structure, the report recognized that antitrust law does not make it illegal to obtain market power by technological innovation.

A similar conclusion was reached by a Conference Board report released earlier this year. 13/ The report was written by Dr. Betty Bock, the Conference Board's Director of Antitrust Research. Bock analyzed monopolization cases in two eras, 1945 to 1970 and 1970 to 1980, to see how the courts treat claims that firms have monopolized by beating their rivals at technical innovation. In

the first era, Dr. Bock concentrated on three important cases filed by the Justice Department, Alcoa, 14/ Du Pont, 15/ and Grinnell, 16/ She concluded that the cases stand for the principle that a firm is not guilty of monopolization simply because of large market share. Rather, the courts will look for predatory conduct to prove a prima facie case, and will allow the justification that market power was built up by innovation, or other efficiency advantages.

In the 1970's, Dr. Bock examines six monopolization cases, five brought by private plaintiffs and one brought by the Federal Trade Commission. She criticizes the underlying theory behind these cases, characterizing them as an attack on normal competitive practices by innovating firms. Without endorsing the criticism, I find it striking indeed that all six plaintiffs failed to persuade the courts to approve the theories. Monopolization law in 1980, with minor variations, stands where it did in Dr. Bock's earlier era. It is emphatically not illegal to succeed by technological innovation, to best your rivals by superior products and business acumen.

It is because we believe that antitrust law and policy are a positive force for innovation that the Antitrust Division has, over the last few years, vigorously sought to convey that message to the business community. One particular point we have repeatedly made is that the antitrust laws do allow significant cooperation among firms, even major competitors, where necessary for research and development of new technology. While there are literally thousands of joint ventures operating in the fields of research

and development, few have been attacked under the antitrust laws. The Justice Department has never challenged a pure research joint project--that is, a project devoted solely to research and involving no collateral restrictions. The Department has challenged only three research joint ventures in the last two decades--and each involved significant collateral restraints which retarded innovation. Our suits against joint research and development projects have been almost as infrequent.

Past Cases Involving Joint Research

Perhaps a brief examination of the three joint research suits we did file will illustrate the point better than cold numbers. In United States v. Automobile Manufacturers Assn., et al., 17/ the Department of Justice charged the four major automobile manufacturers and a trade association of deliberately delaying development and installation of emission control devices. The defendants were accused of a general agreement to eliminate competition in the research, development, manufacture, and installation of the control devices. This conspiracy basically involved the exchange, on an exclusive, royalty-free basis, of all information developed by the defendants concerning emission control devices, including information that would normally be considered company-confidential. The complaint also charged that the defendants could have installed the control devices on 1962 models, but agreed to several delays that resulted in installation in the 1966 models instead. The case ended in a consent decree

which allowed the companies to exchange all but company-confidential information, the kind of product development information that competitors usually do not disclose to their rivals. 18/

Another case in 1969, filed against the Wisconsin Alumni Research Foundation (WARF), 19/ charged that the organization used "grantback licensing arrangements" to acquire exclusive control over patents involving the Wurster process for coating pharmaceutical products. The grantback provision, collateral to the joint research effort, licensed the patents on the condition that the licensees assign back to WARF all patents flowing from improvements. This restriction, we felt, resulted in less innovation since the licensees had no incentive to make improvements.

Finally, in 1972, a suit challenged the Manufacturer's Aircraft Association and 20 major aircraft firms because of their long-standing patent pooling and cross-licensing agreement. 20/ The patent agreement required that all patents be shared among the members, thus suppressing competition for the purchase of patents and patentable inventions. It is our view that a patent pool involving substantially the entire industry posed a threat to continued innovation.

The record seems clear: the Department of Justice rarely challenges joint research and, when it does, the objective is to promote innovation in the long-run. The basic issue in antitrust analysis of joint research projects is whether the particular project will produce more innovation or less.

Access to Successful Joint Research

I suspect that much of what I have said is already familiar to you. In discussing antitrust and innovation with businessmen during the past two years, however, one further question seems always to arise: if our joint research is truly successful-- if it produces something significant in the marketplace-- will the antitrust laws make us share it with our competitors, just because we developed it jointly? The short answer applicable to most, but not all, situations is "No". Only in the very rare instance where a joint venture is so dominant or so successful that access to it offers a major competitive advantage does the question of sharing with non-participants even arise.

Creation of a research joint venture focused on fundamental principles will rarely involve access problems; continued functioning of a joint venture that has produced a facility or a technology with such market impact that outsiders cannot in the long run compete without it makes access analysis more clearly relevant at that point. Where the joint venture controls a unique resource-- one that cannot reasonably be duplicated by competing firms-- the access analysis is most relevant.

In short, the antitrust laws prefer competition, and the second-best solution of the compulsory access rule is therefore usually confined to cases of a genuine "bottleneck monopoly" or "essential facility." Moreover, if access is required, it can

only be required on reasonable terms. In assessing what is reasonable, the costs and risks inherent in a research venture are important considerations, for the access rule is not designed to be an insurance policy for industry laggards.

Cooperative Research Involving Government and Industry

The Division's work in the last year has not only been directed at dispelling the mistaken view that the antitrust laws bar cooperative research. We have also worked with the Commerce Department and the President's Office of Science and Technology Policy to ensure that both antitrust and innovation goals are met when government-industry research projects are undertaken.

Over the past year, the Antitrust Division has worked closely with the Commerce Department on its Cooperative Generic Technology Program. As you probably know, this program is designed to provide federal funding for private cooperative research centers in technologies that cut across industry lines. Earlier this month, Congress passed S. 1250 -- a bill authorizing federal seed money for such centers.

In August, the Commerce Department released its procedure for the Cooperative Generic Technology, or COGENT, program. 21/ We were pleased to see that the Commerce Department has structured its requirements so as to further both research and competition goals. For example, the centers are to be open to all domestic persons, with all technical information resulting from research available to all members at a reasonable cost. The program procedures also bar centers from placing collateral restrictions

on members. The prohibited agreements include restrictions on use of patents and technical information, restrictions on independent research done outside the center, and restrictions on use of technology developed outside the center.

On two other cooperative research programs between Government and industry, we have worked with the Office of Science and Technology Policy. In January, we completed review of the proposed Cooperative Automobile Research Program, known as CARP. This project would provide $400 million, shared equally by the Government and private firms, for basic research to improve automobile technology. The new research would be done in private and public laboratories, and would be reviewed by an independent committee of scientists and engineers.

In August, the Antitrust Division reviewed the proposed Ocean Margin Drilling Program (OMDP). The program would involve basic research and scientific exploration of the area between the outer continental shelf and the deep ocean. The program would run ten years and involve $100 million, evenly split between the Government and the industry participants, which are major U.S. energy companies. The National Science Foundation will have a major role in managing the program.

Both CARP and the OMDP are excellent examples of the type of cooperative research which we feel promotes innovation and competition goals. Both programs are intended to foster basic research projects which would not ordinarily be undertaken by individual firms. Because of the huge scale of the work and the

varied uses of the technology, it is unlikely that any single firm would have the incentive or even the ability to undertake the research.

In our opinion, formally communicated to the Office of Science and Technology Policy, based on the information we reviewed and the safeguards in both plans, the projects are fully consistent with the antitrust laws. 22/

Conclusion

As early as the 1850s, when British commissions reported major American improvements in European production techniques, 23/ our nation's talent for innovation impressed the world. America, since then, has revolutionized the world economy, with a series of remarkable technological innovations. This rich historical tradition, we think, is founded on our competitive economic system. That system brought forth the major corporate research laboratories in the early years of this century. As long as the individual inventor, the corporate research laboratory (large and small) and the joint research project can compete to achieve innovation, America will maintain its success in building "better mousetraps."

Footnotes

1/ J. Jewkes, D. Sawers, and R. Stillerman, The Sources of Invention 95 n.2 (2nd ed. 1968).

2/ See Birr, Science in American Industry, in Science and Society in the U.S. 68-69 (D. Von Tessel and M. Hall, ed.).

3/ Id., at 69.

4/ See Holland, Industrial Research in Retrospect, 21 Research Management, No. 3 (May 1978).

5/ President's Message to the Congress Transmitting Proposed Initiatives on Industrial Innovation, 15 Weekly Comp. of Pres. Doc. 2069 (Nov. 5, 1979).

6/ J. Jewkes, D. Sawers, and R. Stillerman, supra note 1, at 334-38.

7/ Id., at 280-820.

8/ Id., at 286-90.

9/ See R. Miller and D. Sawers, The Technical Development of Modern Aviation (1968).

10/ See M. J. Peck, Competition in the Aluminum Industry, 1945-1958, 201-204 (1961).

11/ See J. Jewkes, D. Sawers, and R. Stillerman, supra note 1.

12/ National Academy of Sciences, Antitrust, Uncertainty and Technological Innovation (1980). This report was based on an earlier workshop, and was prepared by Douglas H. Ginsburg, Assistant Professor of Law, Harvard University, in cooperation with the Committee on Technology and International Economic and Trade Issues of the Assembly of Engineering, National Research Council, and National Academy of Engineering.

13/ Bock, The Innovator as an Antitrust Target, The Conference Board Information Bulletin, No. 74 (1980).

14/ United States v. Aluminum Co. of America, 148 F.2d 416 (2nd Cir. 1945).

15/ United States v. E. I. DuPont De Nemours & Co., 351 U.S. 377 (1956).

16/ United States v. Grinnell Corp., 384 U.S. 563 (1966).

17/ United States v. Automobile Manufacturers Association, Civil No. 69-75 JWC (C.D. Cal. 1969).

18/ 1969 Trade Cas. ¶ 72,907 (C.D. Calif. 1969) (consent decree).

19/ United States v. Wisconsin Alumni Research Foundation, Civ. No. 69-C316 (W.D. Wisc. 1969)

20/ United States v. Manufacturers' Aircraft Association, Civ. No. 72-CIV-1307 (S.D.N.Y. 1972).

21/ 45 Fed. Reg. 54030 (Aug. 14, 1980).

22/ Letter from Sanford M. Litvack, Special Assistant to the Attorney General to Dr. Frank Press, Director, Office of Science and Technology Policy, Executive Office of the President, Jan. 25, 1980; Letter from Richard J. Favretto, Deputy Assistant Attorney General, Antitrust Division, to Dr. Frank Press, Director, Office of Science and Technology Policy, Executive Office of the President, Aug. 6, 1980.

23/ Parliamentary Commissioners, Machinery of the United States, pp. 558, 616, as cited in D.L. Burn, Genesis of American Engineering Competition, 294-95 Economic History, Supplement to Economic Journal II, No. 6 (January 1931).