



A
Decade of Service

1925 • 1935

REPORT OF THE DIRECTOR
WISCONSIN ALUMNI RESEARCH FOUNDATION



THE history of the Wisconsin Alumni Research Foundation is largely the story of blazing a new trail. When the small group of Alumni of the University of Wisconsin met in November, 1925, to organize this Foundation, their only asset was an idea. They were offered by one of the University professors, Dr. Harry Steenbock, a patent application then pending before the United States Patent Office relating to the use of the ultra-violet ray to enrich the Vitamin D content of foods and medicinal products. Vitamin D is the antirachitic vitamin. The story of Steenbock's discovery has been told. What is not so well known is the story of the growth of the Foundation itself.

The objectives of the Foundation are set forth in the following quotation taken from its charter.

"To promote, encourage and aid scientific investigations and research at the University and to assist in providing the means and machinery by which the scientific discoveries and inventions of the staff may be developed and patented and the public and commercial uses thereof determined; and by which such utilization may be made of such discoveries and inventions and patent rights as may tend to stimulate and promote and provide funds for further scientific investigation and research within said University."

When patentable ideas developed by university faculty members are voluntarily turned over to the Foundation, efforts are made to commercialize them, with the understanding that after the cost of development has been recouped, any remaining moneys are to be employed in the support of research in the field of the natural sciences.

Here was a relatively new idea, a social experiment that broke new ground. A private corporation was to function in developing a business, but profits, instead of going to stockholders were to be utilized in the public interest in the form of support for research in a state university.

Most educational Foundations start with an invested capital. Some one has made the money, the income of which he devotes to some special purpose in which he is interested. The Trustees of such a Foundation have only two objectives to carry out:

- 1. To keep the capital invested so as to yield, with safety, a definite and steady income.**
- 2. To spend the income secured in the furtherance of the primary objectives of the Trust.**

The Wisconsin Foundation had no capital; therefore, no income. An application for a patent had been assigned to it. The corporation did not even have a patent; consequently at the outset it was not in a position to do business for the simple reason that it could grant no patent protection to any licensee who might desire to use the process. However, with nothing but an idea, the Wisconsin Alumni Research Foundation was launched in November, 1925.

• PLAN OF THE FOUNDATION

The corporate foundation of the organization was laid on a broad and solid basis.

1. A private corporation was formed with the consent and approval of the Board of Regents and the President of the University. The purpose of this administrative device was to get quick action where business was to be done. Business offices are maintained in Madison, Chicago and New York. The active operations are carried out by the executive staff. The Board of Trustees (six in number)* meet monthly and give their time without compensation to a determination of policies.

Other universities had been offered patentable ideas before by their staff members who were willing that possible profits might be devoted to public rather than private use. Committees have been formed, sometimes made of special faculty groups, sometimes a combination of regent and faculty membership. Such combinations, however well intentioned, are not customarily in position to do business with dispatch. Where such cumbersome machinery has been tried, experience has generally demonstrated, that sooner or later, it became necessary to establish business connections of one sort or another before success could be attained.

2. The plan of organization was made broad enough to permit the Foundation Trustees to accept any proffers of patentable ideas from members of the University staff, students or alumni. Hardly a month passes in which the executive office is not called upon to counsel with University staff members or alumni who are desirous of knowing whether or not their ideas are suitable for patent consideration. The Foundation, through its close connection with patent counsel in Chicago and Washington, is able expeditiously to ascertain by search of the patent files whether the invention under advisement is novel and patentable. Aid of this character extended to staff members has been thoroughly appreciated.

3. The Articles of Organization were also made broad enough to permit the Foundation to act as Trustee for the receipt of gifts, bequests and trusts, to be executed in accordance with the terms imposed by the donor. Already the Foundation has been made the legatee in the estate of one of the faculty, and Trustee for the administration of another gift. As this phase of the Foundation's activity becomes more generally known, it will doubtless be used to an increasing extent in the capacity of Trustee to administer funds that are intended for the support of research.

The form of this legal entity was largely the child of the fertile brain of the late H. L. Butler, a distinguished Madison lawyer.

*The personnel of the Trustees has remained unchanged since the organization of the corporation and is as follows: T. E. BRITTINGHAM, JR., Wilmington, Delaware; TIMOTHY BROWN, Madison, Wisconsin; JUDGE EVAN A. EVANS, Chicago, Illinois; GEO. I. HAIGHT, Chicago, Illinois; L. M. HANKS, Madison, Wisconsin; W. S. KIES, New York, N. Y.

The first license to use the invention was granted to the Quaker Oats Company for the activation of some of its breakfast cereals. It was fortunate for the Foundation that its first patent was of such a basic character and covered subject matter of such merit that many applications for licenses were promptly received.

• SCOPE OF LICENSES GRANTED

The pharmaceutical field was naturally covered in the early years of the Foundation, as the Steenbock discovery pertained to the treatment and prevention of rickets. Later the food field was considered. It has been the policy of the Foundation Trustees to limit the granting of licenses under the Steenbock process in this field mainly to such essential carriers as bread, milk and cereals. Many applicants, recognizing the very great advertising appeal that they would obtain if they were able to fortify their products with Vitamin D, have solicited the privilege of a license, but notwithstanding the fact that such business would have yielded the Foundation handsome royalties, the Foundation's policy is to refuse the use of the process where the objective is an advertising appeal. While Vitamin D products from beverages and sausage to cosmetics and chewing gum are being marketed, it must be kept clearly in mind that miscellaneous products of this type are not sold by licensees under the Steenbock patents. The Foundation has at all times insisted that its good name and that of the University of Wisconsin should not become involved where there was no inherent justification for Vitamin D fortification.

The activation of foods which are essential in the nutrition of the young (and convalescents as well) has received medical approval and support. A large amount of animal and clinical research has been carried on not only by the Foundation itself, but by its several licensees in the food and medicinal fields. None of the antirachitic products that have been made available to the public have had such a wealth of experimental and clinical work carried on with them to substantiate the claims made as has been the case with the Steenbock process. In the very nature of the discovery, the demonstration of the results claimed necessitated long and carefully studied tests and experiments with thousands of rats before the products treated were made available for human use. At the present time, Vitamin D products activated under the Steenbock process, both for medicinal and nutritive uses, are available throughout all parts of the United States, Canada and in most foreign countries.

While the pharmaceutical and the cereal fields received attention in that licenses were granted early for the use of the Steenbock process, in the past two or three years special attention has been given to the application of the process to bread (or flour) and milk. Flour for both home and commercial baker's use is now activated as well as opportunity given baking companies to add Vitamin D through incorporation by means of Irradiated shortening.

The milk field constitutes the largest new development, but before this field was entered over two years of testing was carried out on the machinery developed to utilize the process. In most parts of the United States Irradiated milk can now be secured. Over two billion pounds

of fluid milk is used annually in the production of Irradiated evaporated milk which is sold at no increase in price throughout the United States and Canada.

Fluid milk plants, using directly the radiant energy of the ultra-violet ray for Irradiation under the Steenbock process in the same manner as is employed in the condenseries, are now distributing Vitamin D milk produced under the Steenbock process throughout twenty-nine states, the District of Columbia and Canada.

The process of using Irradiated yeast in the ration of dairy cattle to increase the natural Vitamin D some ten to fifteen times is also widely used, as this process licensed under the Steenbock patent, can be readily applied to the product of the individual herd or even to a single animal. This type of milk called "metabolized" milk is now available in nearly 250 cities in thirty-five states, Alaska and British Columbia. Irradiated milk is also converted into dried or powdered form without any loss whatever in its Vitamin D potency. Thus literally Vitamin D fortified dairy products are available to the ends of the earth. Byrd's Antarctic Expedition was supplied with Irradiated evaporated milk and this past year the Dionne quintuplets also were fed Vitamin D enriched products prepared by three of the Foundation's licensees. The aim and purpose of the Foundation has been to make this improvement available so that *any family* in the United States can readily secure this nutritive benefit without difficulty. This objective has been realized far beyond the expectations of the Foundation. It has been widely stated that the fortification of fluid milk through Irradiation has been the most important advance that has occurred in this field since the introduction of Pasteurization some thirty years ago.

Milk contains the essential building blocks of calcium (lime) and phosphorus which can be most readily assimilated and built into strong bones and teeth in the presence of Vitamin D.

• PATENTS AND APPLICATIONS ALREADY ASSIGNED TO FOUNDATION

While the chief business activity of the Foundation has been the commercial development of the Steenbock patent, the organization would have fallen far short of its objective, if its work had been limited exclusively to the development of this single discovery. During the brief span of its existence, the Foundation has already been made the assignee of twenty-one patent applications. Of these applications, sixteen have already been issued as United States Patents. The Steenbock process and the Hart process of utilizing copper with iron in the treatment of secondary anemias have been put on an income-producing basis. Several other discoveries are now under consideration for license.

• FOREIGN PATENTS

The Foundation early took the necessary steps to secure foreign patent protection on the Steenbock and several other patentable processes. In Canada, Great Britain, France, Germany, the Argentine and Australasia, the Steenbock process is fully controlled and substantial income is derived from its use in these countries.

The business procedure entailed by the Steenbock patent alone has required the organization of a competent staff to develop and control its proper use. The Foundation assumes the responsibility of guaranteeing to the consuming public the availability of a stabilized product. In addition to the control exercised by the Federal Government through the United States Food and Drug Administration (the government assumes no control over city milk supplies as this business is not interstate traffic), the Foundation maintains a central laboratory at Madison, where many thousands of animals (white rats) are used annually, to check the uniformity and potency of the licensed products. In addition to this central laboratory ten other laboratories are used in the United States and Canada, from the Atlantic to the Pacific, where products are also constantly subjected to analytical examination. In this control work the Foundation spends nearly \$50,000 a year, but such control is regarded as desirable for the proper protection of the public and the licensees as well.

The commercialization of any invention is necessarily a slow process. Rarely is it possible that an idea when it is first evolved is ready to be put into actual commercial use. On some of the patents assigned to the Foundation, many thousands of dollars have already been invested before any effort could be made to make the patent self-supporting. In all, the Foundation has invested in these undeveloped patents over \$36,000.

• ATTITUDE TOWARD MEDICAL PATENTS

While the Foundation believes that its course of procedure regarding the commercial utilization of patentable ideas assigned to it by University staff members is thoroughly justified, it fully recognizes that there can well be a difference in treatment between so-called medical patents and those of an industrial character. During this past year, it has had occasion to define its policy in this regard, especially with reference to discoveries and inventions of a medical nature. The following principles will be applied:

1. Owing to the widely varying nature of the applications that may be made, the Foundation regards it as impractical to attempt to formulate any general rule that can be applied to all cases. Consequently, each case will be studied as it arises, but in general the following principles will obtain.
2. Patents should be secured where a lack of control in the use of the patented article might result in undue exploitation of the public; in lack of uniformity of standardization; and in confusion of the public mind as to the inherent values of the product.
3. In certain types of medical discoveries, the Foundation considers that it is its obligation to administer such patents in a way designed to benefit the public without thought of any financial return other than that required to safeguard and control the proper use of the product and to provide funds for clinical and scientific work in connection with the same.

The particular point at issue came up in connection with the development of the Hisaw and Fevold patents for the isolation and purification of the hormones derived from the an-

terior pituitary glands. Due to the fact that these products in the hands of the public without close medical supervision could be grossly misused, it seemed obvious that the Foundation should be in a position through patent control to prevent such abuse. The details have not yet been worked out in final form, as to just how these two patents will be handled, but this type of discovery is an illustration where the principle laid down in (3) above will be applied.

It is recognized in this matter of developing medical patents that there are two distinct and diametrically opposite schools of thought; that from some points of view there is much that can be said in favor of the idea advanced by the distinguished representative of the Johns Hopkins University, Dr. Wm. H. Howell, who, in an address before the American Physiology Society in 1934, held that,

"discoveries in medicine and science which alleviate human suffering or promote in any way the welfare of humanity should belong to the public and their benefits be freely enjoyed by all without any pecuniary profits."

Applying Howell's theory, it was wrong to control by patent the production of insulin which has proven such a boon in the treatment of diabetes.

A recent editorial* commenting on this action and the subject of medical patents said,

"If this (referring to insulin) is wicked the Universities should be consistent and reject all endowments for medical research, for endowments come from profits — sometimes profits from the sale of patented drugs and medical apparatus, and the authors of books on medicine and surgery should spurn royalties, since there is no difference in principle between copyrights and patents."

"What with mounting estate, inheritance and income taxes, the day of open-handed philanthropy is over. Either the State must come to the aid of research, which it can do only by piling on more taxes, or science must help itself without sacrificing its perfect objectivity and humanitarianism. Patenting medical and biological discoveries not for personal gain, but for the sake of science, seems an honorable and democratic solution of the difficult problem here presented."

• HOW THE FOUNDATION UTILIZES ITS RESOURCES

The Foundation enters into a standard contract with all of its assignors, viz., to pay them (or their estates) a 15% royalty on the net avails derived from any patent, after the expenses of securing, maintaining and defending the patent have been repaid to the Foundation. The remaining 85% of the net returns accruing to the Foundation is invested as an endowment, the income of which is turned over to the University for the support of scientific research.

Naturally at the outset before earnings were in excess of actual expenditures there was no income available. Beginning with the payment of a small amount in 1928-29, the following amounts have been paid to the order of the University Regents during the past decade and have been used for the following purposes:

*New York Times, December 1, 1935

• REGULAR AID

1. Grants-in-aid of research.
2. Foundation Scholarships and Fellowships.
3. Full time Professorial Summer Research.
4. Foundation Lectureship.
5. Game Management Investigations.
6. Industrial Fellowships.

• EMERGENCY RELIEF

1. Post Doctorate Fellowships.
2. Professorial Leaves of Absence.

**SCIENCE RESEARCH AT UNIVERSITY OF WISCONSIN
SUPPORTED BY FOUNDATION FUNDS**

YEAR	REGULAR AID				EMERGENCY AID			TOTALS
	Grants-in-aid of Research	Foundation Scholarships and Fellowships	Game Management Investigations	Foundation Lectureship	Post-doctorate Assistantships	Leaves of Absence	Industrial Fellowships on Foundation Research	
1925-28								
1928-29	\$1200.00							\$1200.00
1929-30	9700.00							9700.00
1930-31	15810.00							15810.00
1931-32	17723.00			\$1000.00				18723.00
1932-33	24653.00			1000.00	\$10000.00			35653.00
1933-34	55180.00		\$8000.00		10000.00	\$69683.00	\$ 4800.00	147663.00
1934-35	63146.00	10000.00	8000.00			76558.00	11680.00	169384.00
1935-36	90000.00	10000.00	8000.00	3500.00			17200.00	128700.00
1936-37	110000.00	20000.00	8000.00	*			**	138000.00
TOTAL	\$387412.00	\$40000.00	\$32000.00	\$5500.00	\$20000.00	\$146241.00	\$33680.00	\$664833.00

*No final arrangements yet made for 1936-37.
**Not yet allocated.

1. GRANTS-IN-AID OF RESEARCH

By far the larger part of the aid which has been given to the University has been for the support of a steadily increasing number of specific projects that are yearly proposed by the several departments in the field of the natural sciences. These projects are administered entirely through the University Research Committee of the Graduate School, and the selection of the approved projects is in no way controlled by the Foundation authorities.

Fear has been expressed in some educational circles that the freedom of intercourse between scientific workers would be greatly interfered with if a policy of patent protection of University discoveries was developed. Experience at a number of institutions has demonstrated

that such a fear has been quite unfounded. Of the various discoveries that are being made at Wisconsin, for instance, not more than two or three cases a year come forward for serious consideration as to their patent possibilities.

An English scientist, Sir William Fletcher, recently voiced this criticism before an American University audience:

"If financial gain comes to a University, there must arise moreover the grave dangers of a vicious influence affecting the outlook of all the individual workers within it. It will be difficult for them not to feel that the University will be more inclined to reward by pay or promotion him who makes some addition to knowledge of any immediately profitable kind rather than him who works for the sake of knowledge itself. Nothing could be more disastrous than this, as we know, to the advancement of knowledge itself and in the long run, indeed, to the material gains in the world."

So far, experience has demonstrated at the University of Wisconsin the very opposite of the fear expressed by Sir William. Among the most productive men in science at the university, with reference to their discoveries, are to be found those who have been aided in their research with financial grants from the Foundation. These grants have been made without any reference whatever to the practical outcome of their work.

Of the ninety projects that have been approved for aid during the current year by the University Research Committee, only two could possibly be construed as having any bearing whatever on problems that might have a commercial application. As a matter of fact, even in these instances the subject of the investigation is being developed from the scientific standpoint rather than from the commercial viewpoint.

Of the projects that are being aided during the present year, thirty-eight are in the College of Letters and Science, twenty-six in the domain of the College of Agriculture, twelve in Engineering and twelve in the Medical School.

Through the medium of the Grants-in-Aid between one hundred to one hundred twenty graduate science students showing the greatest promise of distinction are annually given the opportunity to pursue specified studies under the direction of the professor in charge of the project. A substantial number of these problems are allocated on a long term basis, as three to five years, so that the work can be given a security of support which would not be possible if there was no assurance of more than a yearly grant. The development of this system for the aid of systematic research has been of inestimable benefit in supporting the morale of the scientific staff during the trying times incident to the depression. Numbers of staff members have stated that their unwillingness to accept offers from other institutions at higher personal salaries was due primarily to the secure support which they had been able to receive from the University through the aid granted by the Foundation.

While most of the Grants-in-Aid are for the salaries of assistants and the necessary supplies connected with the work, the Graduate Committee has in special instances used substantial sums to provide for the purchase of expensive apparatus that would hardly be supplied from the regular University funds.

2. FOUNDATION SCHOLARS AND FELLOWS

Graduate work of the best character can be most effectively aided through the development of a system of scholars and fellows. Appointments based rigidly on scholarship and merit, selected after a most critical examination of credentials, is the most likely way to recruit the staff of an institution.

The University of Wisconsin is not financially able to induce the most outstanding men in science to join its staff in competition with the richly endowed private universities. But the investigators of the future are always in the making. Deans Slichter and Fred of the Graduate School have, through the medium of the special fund made available by the Foundation, brought to the University for the past three years a most unusual group of young men and women graduates, especially interested in science. The scholastic records of the applicants that have been finally selected for 1936-37 are so far superior to the average senior of the University in scholarship, that Dean Fred has reported that not more than one or two out of a thousand seniors graduating from the University had a scholastic record that was equal to the average of the group of fellows selected.

The success of this educational experiment for the first two years was so marked that the Foundation doubled the allocation for the present year, making \$20,000 available. The University Committee making these selections has no limitation as to the amount available for any individual case. If the previous training of the candidate warrants giving him an opportunity to study elsewhere in this country or abroad, the Committee is in position to make an appointment with these privileges. Of the 181 applications this year filed by staff members of 90 collegiate institutions, 38 fellows and scholars have been selected by the Committee.

3. FULL TIME PROFESSORIAL SUMMER RESEARCH

Most of the research work at the University naturally has to be carried on during the period of the regular academic year while the teaching work of the institution is in progress. For many years instructional work has also been given during a six weeks' summer session, but no specific provision has heretofore been made in the University for the prosecution of summer research on a whole time basis, except in the College of Agriculture where the investigational work of the Experiment Station naturally has to be more or less continuous.

This coming year at the request of Dean Fred, provision was made through an appropriation by the Foundation Trustees of \$25,000 to inaugurate full time summer research for a number of members of the regular institutional staff. Persons appointed for summer assignments are not permitted to do instructional work. The research program is to be closely correlated with the regular work of the academic year.

This fund is to be used primarily to defray the salaries of staff members, including not only members of the professorial group but associates and instructors as well. This coming

summer fifty-four members of the regular University staff have been assigned by the University Committee to specific research under this project.

It is the hope of the University that this new feature will enable a more complete utilization to be made of the research resources of the institution both intellectual and material.

4. FOUNDATION LECTURESHIP

To stimulate the spirit of research throughout as wide a sector of the University as possible, the Foundation has provided funds to enable some outstanding man of science to be brought annually to the University campus for a series of lectures and colloquiums with graduate groups. In the past few years such eminent scientists have been secured as

Dr. Walter B. Cannon, Harvard University, in Physiology
Dr. Ross Görtner, University of Minnesota, in Biochemistry
Prof. Robert M. Millikan, California Institute of Technology, in Physics
Dr. Arthur H. Compton, The University of Chicago, in Physics

This coming fall plans will be carried into effect that will somewhat vary the scope of this work. A symposium on the subject of cancer is to be held under the sponsorship of the Medical School.

Plans are now being matured to bring together the leaders in this subject, both in Europe as well as America. While emphasis will be given to the scientific approach to this wide field from the genetic, cytological and biochemical viewpoints, the latest clinical findings will also be emphasized. The expenses of those participating in the program will be borne by the Research Foundation. The Wisconsin State Medical Society has been invited to hold its annual meeting at the University at this time. Whether this scientific symposium will for a time replace the regular Foundation lecturer will be later determined. Such a symposium will unquestionably be of much value to the scientific spirit of the Medical School.

5. GAME MANAGEMENT INVESTIGATIONS

In 1932, when the financial situation at the University was such that it was wholly impossible to entertain the idea of any expansion whatever into new fields of inquiry, the Foundation offered the University the opportunity of organizing an entirely new type of work, viz., game management investigations. This phase of the broader subject of conservation had up to this time not been seriously approached from the scientific viewpoint. The unusual opportunity fortunately presented itself to secure the services of Aldo Leopold, who was already recognized as an outstanding factor in this field. Here was a line of effort that at the moment gave the University a chance to take a leading position.

The slump in farm real estate values, due to the depression and high taxes, had laid an almost confiscatory hand, on a constantly increasing amount of land in the state with the result that millions of acres have reverted to the public domain. The situation with reference to the individual land owner was also pressing. Many farms possess a certain amount of sub-

marginal land that cannot well be segregated from the tillable acreage. Rising taxes make these areas a heavier and heavier burden for the farm to carry as a unit. Land of this type should be removed from direct agricultural use because it cannot profitably be employed in crop production.

The last three years have witnessed a marked awakening of public interest in this regard which is being reflected by the efforts now being put forth by the federal and state governments to study the question of how best to readjust the economic use of land. Areas of this type may be in part available for forestry. Also the propagation of wild life and game afford the opportunity through hunting and recreational privileges to produce a certain amount of income that will help in part at least to carry a share of the tax burden. The development of wild life and game values will not be satisfactorily solved until they are integrated with the functional activities of the agricultural use of land.

It was logical therefore for the University in accepting this opportunity to correlate this new venture in the investigational field with the Department of Agricultural Economics. It was exceedingly fortunate that the University was able to take this advance step just when these land problems were being restudied from this new point of view. Prof. Leopold's services have been requisitioned by President Roosevelt in his efforts to work out some practicable scheme for the utilization of these land areas.

6. INDUSTRIAL FELLOWSHIPS FOR FOUNDATION RESEARCH

The various inventions and discoveries that are brought to the Foundation from time to time by University staff members are often only in an embryonic form. More work has to be done before it can be wisely decided that the problem in question is one that is worth spending money to develop commercially.

The Foundation itself is not well equipped to prosecute such developmental research. The widely differing types of work involved in its varying patent applications make it quite impossible even to consider the organization of a laboratory that could possibly cover the wide range of its needs.

While the University laboratories are, of course, not specially equipped to handle problems of this nature, often much progress can be made on a small scale basis. Larger industrial organizations have research laboratories to which such problems can be referred. Competent staffs exist with adequately equipped laboratories to carry through to successful termination any problem that comes up for consideration.

To aid in the development of industry the University has for years been willing to open its doors where it could be of service in furthering research under closely controlled conditions. The industrial donor in such a case provides the necessary funds, leaving to the University authorities the selection of the necessary personnel, the supervision of the work and full control as to publication of the scientific results. Under this system of "Industrial Fellowships" some of the special problems in which the Foundation is interested have been

• INHERENT INSTABILITY OF PATENT EARNINGS

The necessity for such a conservative course of action is greater when reliance is based on earnings derived solely from patent developments than with any other form of a business enterprise. Ordinarily a business that has been built up after years of effort has a "going" power in "good will" that is frequently valued in millions. Not so, when a business is founded on patent licensing. No one can predict that the owner of a patent will be permitted to enjoy the privilege of control for the 17 year period that the Federal Government makes available to him. If a patent is of no particular commercial value the owner will probably escape the vexations incident to litigation. If, however, it becomes valuable, one may rest assured that the most strenuous efforts will be made to void it. Even if this cannot be accomplished, infringers are sure to arise. Such infringers must be dealt with promptly and effectively. Consequently, a valuable patent is constantly under fire until its validity is finally adjudicated by the higher courts..

Therefore the individual inventor is often at the mercy of organizations that are sufficiently provided with financial resources to prolong litigation. In such a situation as this, an organization like the Wisconsin Foundation is able to serve the University and its staff in a very unusual way. The accumulation of sufficient reserves to enable protracted opposition to be met is often the best insurance against attack. Preparedness sometimes promotes peace.

• SUPPORT OF CLINICAL RESEARCH

With a patent covering a wholly new field as was the case with the basic Steenbock patent on the use of ultra-violet ray, obviously, it was necessary to undertake a large amount of clinical research. By virtue of the fact that most of such research has to be carried out under closely controlled hospital conditions, it was impossible to secure facilities of this type of work at this University.

The following amounts have been expended in such clinical studies at other institutions than the University of Wisconsin:

1933 Brown University; University of Toronto	\$8,031
1934 The Trudeau Foundation, Saranac Lake, N. Y.; University of Toronto	11,432
1935 Oregon Medical School, Portland; Children's Fund, Detroit; Children's Hospital, Philadel- phia; Trudeau Foundation, Saranac Lake N. Y.; University of Illinois Medical School, Chicago; Hospital for Sick Children, University of Toronto; Herman Kiefer Hospital, Detroit; Children's Hospital, Boston	62,550
TOTAL	\$82,013

In the main, these studies were made to ascertain the prophylactic effectiveness of Irradiation where the ultra-violet ray is applied directly to fluid and evaporated milk, also where the activation of foods is accomplished indirectly by the addition of previously Irradiated products such as ergosterol and cholesterol. The commercial success of the discovery together with the good name of the Foundation and the University were dependent on the demonstrable effectiveness of the product. Supplementing what the Foundation itself has done by the way of experimental and clinical research, the various licensees have also undertaken on their own particular products a large amount of similar work. The result of these combined studies has materially strengthened the position of the Steenbock process in not only the medical, but the lay mind.

• INVESTMENTS OF THE FOUNDATION

To produce a permanent, steady income requires close attention to the investment of earned royalties. A committee of the Trustees has had this matter in charge since the beginning. At the outset conservative principles of investment were laid down by the Board.

In order to secure thorough diversification, limits were placed on the amount of money that could be invested in any single security. Geographic distribution of the business involved and the type of security were also taken into consideration.

At the outset, investments were made almost entirely in bonds of seasoned companies. With the uncertainties that have obtained as to the future of the financial situation, especially with regard to the possibility of inflation, with the consequent effect that would be likely to occur with fixed securities, such as bonds and mortgages, equities of well-known listed stocks have more recently been added to the portfolio.

Constant attention on the part of the Investment Committee is required as under present conditions bonds are steadily being called and refunded at substantially lower interest rates. Although this situation has resulted in a loss of substantially one per cent in the rate of interest received on the several hundred thousand dollars of bonds that have been called since the beginning of 1935, this reduction in bond income has almost entirely been made up by the increase in dividends on stocks that have been added to the Foundation's investment portfolio during this same period.

As of January 1, 1936, the distribution of invested funds of the Foundation, classified on the basis of different types of securities is as follows:

Bonds, including Governments	63.6%
Real Estate Mortgages	3.3%
Preferred and Common Stocks	33.1%

At the present time, the portfolio has only one issue in default as to interest, which in amount is less than one-fifth of one per cent of the invested capital of the Foundation. The operation of the Foundation has already resulted in producing an income that can be considered as substantially permanent and will go far toward the support of the science research of the institution.

• CONCLUSION

It would be presumptuous to forecast what may be the future of the Foundation as to earning power, but it is worth noting that the earnings of the Steenbock patent alone have carried the entire cost of administration for the past decade, made possible giving to the University in that time well toward \$700,000, and further providing an endowment sufficient to produce an annual income from \$125,000-\$140,000 a year for the future needs of research at the University of Wisconsin.

The Wisconsin Foundation has successfully attained only one of its objectives, viz., the commercial development of the Steenbock and Hart patents. It has still to develop a number of other inventions that are in various stages of perfection.

It will not have achieved its ultimate objective until it has its business sufficiently diversified through the commercialization of these additional projects so that whatever may happen to any single patent which it has under its control, the permanence of its program will not be jeopardized by some untoward accident. If it succeeds in demonstrating to the educational world that its experiment in socializing profits that may arise from patent procedure so that the society at large rather than the individual may receive such benefits, it will have accomplished the primary objective of the group of alumni who have given unreservedly of their time and energy to the accomplishment of this purpose for their Alma Mater.

Such is the record that has been written of the first decade in the life of the Foundation. When this Foundation "comes of age" in 1946, it will be interesting then to note the record of its achievement.

Madison, Wisconsin
May 25th, 1936



DIRECTOR