The university. July, 1914

BULLETIN OF THE UNIVERSITY OF WISCONSIN
Serial No. 666; General Series No. 478

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FOREWORD

Inquiries are received daily in regard to The University of Wisconsin, some relating to finance, others to the work of the different departments, others to attendance, others to degrees, etc.; in short, there is scarcely an aspect of the University, concerning which questions are not asked. As a means of quickly and economically answering these questions, this bulletin has been prepared. Copies may be had by making application to W. D. Hiestand, Registrar, The University of Wisconsin, Madison, Wisconsin.

THE UNIVERSITY

Scope of University

The work of the University is along three lines, (1) instruction of resident students at Madison, (2) instruction by extension, and (3) research and laboratory testing. The University was first created for the instruction of the students who come to Madison; later the work spread into the other fields. The research and laboratory work and the extension teaching are for the benefit of the people throughout the state; the expense of maintaining this work has no relation to the instructional work at Madison. As a matter of convenience, the order of treatment is the reverse of that mentioned.

RESEARCH AND LABORATORY TESTING

The research and laboratory work ranges from that in agriculture and engineering, which is of direct material advantage to the state, to lines of work which concern man and which are a help to him rather than to his wealth.

THE COLLEGE OF AGRICULTURE

The research work of the College of Agriculture is that which gives the largest financial return. It is demonstrable that the added wealth of the State of Wisconsin each year due to this college is several to many times the appropriation to the University by the state.

Dairy Products

The Babcock Test

Of the seven tests widely used in dairying, six have been originated or improved at the Wisconsin station. The Babcock fat test, invented twenty-four years ago, furnished a simple means of paying for milk on the basis of quality and for detecting fraud. It saved the factory system of butter making from ruin. This test permits of a more careful control of factory processes than formerly, thus saving more than half of the fat earlier lost in the skim milk produced in creamery operations. For Wisconsin alone this amounts annually to a saving of over 1,500,000 pounds of butter. The greatest service of the Babcock fat test, however, has been in making possible the improvement of dairy cows, by eliminating unprofitable animals, and thus giving a scientifically accurate foundation to dairying. In addition to the Babcock test, the Hart casein test, and the Wisconsin curd test, the sediment, moisture, and acid tests are in general use.

Cold Curing of Cheese

The cold curing of cheese, invented in the experiment station of the University, has revolutionized the curing of cheddar cheese, diminished the losses due to shrinkage, and markedly improved the quality of the product. The process is now in general use throughout this state and in other leading cheese producing centers in the United States and Canada.

These tests and improvements made at the experiment station, which, together, form the most important contribution ever made to the science of dairying, and the work of the Wisconsin dairy school, have enabled Wisconsin to gain the first rank among the states of the United States in the production of both cheese and butter. Since the Babcock fat test was discovered the value of the dairy

Value of Dairy Products

products of the state has increased from $21,000,000 to $80,000,000 per annum. It cannot be doubted that a considerable percentage of this increase has been due to the campaign of investigation and education which has been carried on by the University.

Field Crops

One of the greatest possible improvements in agricultural production is through the substitution of improved seed for scrub varieties. Beginning about 1898, efforts were made to develop seeds adapted especially to Wisconsin soil and climatic conditions.

Corn to Lake Superior

CORN: While southern Wisconsin was formerly considered to be near the northern boundary of the corn belt, the results of breeding corn adapted to the state have pushed the border of this belt north to the shores of Lake Superior. Efforts have been made to produce varieties of leafy character, as well as a high yield in grain, so as to be suitable for silage. Five distinct high yielding varieties of corn developed by the college have largely displaced the scores of inferior varieties formerly grown in the state. The introduction of these high grade varieties has increased the value of the product by millions of dollars per annum.

No. 7 Corn

No. 7 corn, through a five-year test in which 1,550 members of the Experiment Association took part, gave an average yield of 62½ bushels per acre. This yield is about 12 bushels more than any other corn compared with it. This variety is now generally used not only in southern Wisconsin, but is rapidly becoming the standard corn in northern Iowa, Minnesota, Michigan, and Ontario.

Golden Glow

Golden Glow (Wisconsin No. 12) has been developed for the central half of the state. This

corn is now getting a firm foothold on the central corn belt of Wisconsin, and has rapidly displaced the common corns of that region.

Wisconsin No. 8

Wisconsin No. 8 was bred for the northern corn belt. This corn has been further improved by the branch stations and now is taking a prominent part in displacing flint corns and other common corns in the northern part of the state.

Pedigreed Barley

CEREALS: The Select Oderbrucker barley, improved by the college and first disseminated in 1905, in a five-year test with 1,020 members of the Wisconsin Experiment Association, yielded 4.9 bushels more per acre than the best varieties with which it was compared. A new pedigreed barley, developed from the Select Oderbrucker, disseminated in 1909, yielded on the average 3 bushels per acre more than the parent strain.

Pedigreed Oats

In 1904, four million bushels of Swedish select oats, which variety was introduced by the college, were grown in this state. Pure bred oats, developed from this strain and disseminated in 1911, in tests by 308 growers, yielded 9.2 bushels more per acre than the common varieties. A new pedigreed oats has now been produced especially for heavy soils, which will stand erect when other varieties lodge.

Pedigreed Rye

Similarly, pedigreed ryes and winter wheats have been developed and widely introduced. In tests throughout the state in 1911 and 1912, pedigreed rye gave 35 per cent. greater yields than the varieties previously grown.

CROPS FOR UPPER WISCONSIN: On the branch and demonstration stations at Ashland, Superior, Spooner, Crivitz, Marshfield, and Conrath, crops especially adapted to the red clay, sandy, and clay loam soils of upper Wisconsin have been developed.

Pure Bred Wheat

Pure bred strains of wheat yielding over 45 bushels

per acre have been produced, which will again make Wisconsin an important wheat producing state. Pedigreed peas give great promise in the Lake Superior region, naturally fitted by soil and climate to this crop.

Pedigreed Tobacco

TOBACCO: A strain of Connecticut-Havana tobacco, especially suited to Wisconsin conditions, was developed by selection. The seed of the strain has been distributed to growers for several years, until it is now rather generally grown. A new pedigreed strain has just been developed, which produces on the average two more leaves per plant than that first introduced. Dissemination of this strain will be begun next year.

Elimination of Plant Diseases

Upon the protective side of agriculture many advances have been made which have enormously reduced the losses from plant diseases. A few years ago more than twenty per cent. of the oat crop was lost by smut. A method was introduced by which this loss was reduced to one-half of one per cent., resulting in an estimated annual saving of $4,500,000. A similar campaign for the eradication of smut of barley has saved the growers $500,000 annually. The loss of potatoes, due to blight and other diseases, used to run as high as 10,000,000 bushels a year. This loss has been largely prevented by sprays introduced through the college of agriculture. Losses from other plant diseases have been greatly reduced by the development of methods of eradicating diseases of peas, cabbage, tobacco, and onions.

Great Reduction of Losses

Sandy and Red Clay Soils

In Wisconsin, there are four millions of acres of sandy soils and three millions of acres of red clay

soils. Investigations at the northern sub-stations have shown that these lands may be made fruitful. Thus, it has been demonstrated that the light sandy soils by proper treatment will produce heavy crops of corn and clover; and that the clay soils, with proper drainage, are well adapted to crops of peas and clover.

Sandy Soil Productive

Other Advances

Numerous other advances in production have been made by departments which, within the space available, cannot be mentioned. Some of these are illustrated by weed elimination, development of fruits adapted to Wisconsin, the management of cranberry bogs, feeding of stock, etc., etc.

Economics of Agriculture

While problems of production have naturally occupied a large part of the attention of the College of Agriculture for many years, the organization of a Department of Agricultural Economics in 1909 was made with specific reference to the desirability of making scientific studies in this phase of agriculture. This department has expanded more in the last five years than has any other.

Marketing and distribution have been given much emphasis since the establishment of the Department of Agricultural Economics. Studies have been made upon the marketing of cheddar cheese and the results have been published. Work on the conditions of marketing of other types of Wisconsin cheese and the marketing of potatoes are well under way. The purpose of these studies is to ascertain the conditions now existing regarding the marketing of these products in order that we may have a foundation

Marketing of Cheddar Cheese

upon which to base improvements in present methods.

Studies are almost completed upon the existing rural credit facilities for the old, well developed part of the state and for the pioneer communities in the northern part of the state. These two represent the extreme of credit conditions, and a knowledge of them will give the basis for their improvements.

Rural Credit Studies in Cooperation

Material is being accumulated relating to cooperation. It is the purpose to study the many conditions which affect success in cooperation, and to make this information available to those who are considering cooperative enterprises.

The Wisconsin Country Life Conference, held annually at the time of the Farmers' Course, has become recognized as a leading factor in crystallizing ideas concerning rural life improvement. Methods of conducting rural social surveys have been formulated. Bulletins on community events and rural social centers have been distributed.

Bulletins Published

Already there have been published bulletins upon (1) the methods of renting farm lands and the results of the renting system upon the prices of farm products, (2) the progress of the dairy industry in Wisconsin, (3) the marketing of cheese, (4) cost accounting in farming, and (5) cooperation and the conditions of its success. Work upon the marketing of Swiss, Limburger, and brick cheese is nearly completed, and when published, should lead to economies in handling the product. A study on farm credits will soon be available.

"Better Business and Better Living"

In short the College of Agriculture is now pushing vigorously the questions of the business and living sides of farming; and it is aimed to give assistance to the farmers of the state along these lines in proportion to that which it has given along productive lines.

THE COLLEGE OF ENGINEERING

An important function of the College of Engineering is research in applied science relating to engineering problems. In this work the college has made much progress during the past ten years. Twenty-six university bulletins have been published containing a part of the results of this research work. Many other contributions have been published in transactions of technical societies and periodicals, based on work done in the engineering laboratories.

Engineering Bulletins

The Hydraulic Laboratory

Water Machinery Studies

The hydraulic laboratory has been one of the most active in research work. Important studies have been made on the efficiency of pumps and water wheels, on the flow of water through pipes, channels, and orifices, and other hydraulic problems. A publication on the subject of rain fall and stream flow in Wisconsin is a very important contribution to our knowledge of this subject. The hydraulic laboratory is now engaged in an efficiency study of low lift pumps such as are used in cranberry marshes.

The Chemical Engineering Laboratories

Iron Alloys

From the Chemical Engineering Department a large number of important papers have been published. In the investigation of the properties of alloys of iron with various other metals, this department has taken a leading position, and results of great consequence have been produced. The use of nickel steel in the construction of large bridges is increasing. Investigations of the college

indicate that quite as good results are likely to be secured by the use of copper-iron alloy at a considerable reduction of cost.

Significant studies have been made in several other directions, notably on the electro-magnetic properties of metals and on the corrosion of iron. A very important investigation undertaken in this department has been the testing of the various gas calorimeters sold on the American market. This has been done in cooperation with a committee of the American Gas Institute.

Corrosion of Iron

Testing Laboratories

One of the most fruitful fields of future investigation and one in which great advances are likely to be made is that of the materials of construction, their properties and economic uses. An extensive series of tests is being made concerning the properties of the various local materials of the state with reference to their use in concrete construction. Variations in the qualities of sand and gravel are of great consequence in cement construction. It is therefore planned to make a thorough study of available materials in several of the more important localities of the state. Other studies which are being conducted relate to the waterproofing of concrete and the temperature variations in concrete chimneys.

Concrete Construction

Steam Engineering Laboratories

In Steam Engineering, important investigations have been made on the economical transmission of steam over comparatively long distances. Studies on the specific heat of steam have led to the invention of an exceedingly accurate meter for the measurement of any kind of gas under any pressure.

Gas Meters

This meter is being installed in some of the largest gas plants in the United States and Europe. Other studies of significance relate to the testing of various forms of shaft bearings and of steam and gas engines.

Structural Engineering Laboratories

Bridges

In the Structural Engineering Department a very extensive series of tests of the effect of rapidly-moving trains on bridges has been conducted during the summer vacations of the past six years under the auspices of the American Railway Engineering and Maintenance of Way Association. These tests have been practically completed, and a report published, which will have an important bearing on the design of railroad bridges.

Electrical Engineering

Standards Laboratory

In the electrical laboratories important researches have been made on various problems relating to high tension transmission and forms of electric lamps. In this department a standards laboratory has been maintained for some years for the purpose of calibrating electrical instruments as well as for regular instructional purposes. By an agreement between the University and the State Railroad Commission the latter makes direct use of this laboratory in connection with the inspection of public utilities. Instruments are also sent to this laboratory by the various public utilities and industries of the state for testing and calibration.

General Statement

Wisconsin Industries Assisted

Most of the problems under investigation in the College of Engineering are broad in scope, and are of value to the profession and the industries at

large, having the same application in the state of Wisconsin as elsewhere. Many local problems have also been included in the work referred to above; and where such problems are of considerable importance, they should and will have preference over those of general character.

THE MEDICAL SCHOOL

Medical Advances

On the research side the Medical School has been active in all departments. In anatomy the work has been largely directed to a study of factors concerned in human development. In physiology special attention has been directed to the heart and the circulation. In pharmacology the part which oxidation plays in the bodily processes is being studied. In pathology the blood has been a special object of study. Recently Hodgkins' disease has been a subject of investigation. This is a disease of the lymphatic glands and its causative agent appears to have been found. This work has attracted much attention.

Student Health

One of the most distinctive features in medical research at the University is that which connects itself with student health. The Department of Clinical Medicine is studying the entire student body with relation not only to the improved health and efficiency of the students, but with reference to the general problems of maintenance of health. The work of this department is primarily on the preventive side; but in order to avoid epidemics, it is necessary that each individual be cared for. To this end each student is examined when he enters the University and from time to time he is given advice in regard to the conduct of his daily life; also

each student is free, when subject to any attack, to consult the department. During the last year over ninety per cent. of the students voluntarily asked advice. The number of cases per day handled by the office is from 125 to 150, and some days more than 200.

The Medical Department does not attempt to treat chronic cases requiring prolonged treatment, nor does it handle surgical cases; however, it sees that such cases reach physicians and surgeons and that they have the advantages of hospital facilities.

Facilities Hospital

At the Madison General Hospital two wards are available for students; and a small isolation hospital is maintained by the University for handling cases of measles, chicken pox, mumps, etc., which cannot be sent to the general hospitals, nor should be sent to the city contagious hospital.

The general studies on student health are illustrated by those on student activities. The one investigation already published deals with the effects of athletics on the heart.

Health and Efficiency

Thus while some medical care as well as advice is furnished individual students, the primary object of the work is not to furnish free treatment to the individual; but to apply medical science to the promotion of the physical efficiency and thus, indirectly, to the mental efficiency of the students as a whole, and at the same time to provide individual instruction of lasting value. The student who seeks medical advice is doing as much, and sometimes more, for his fellow students than for himself. If he has a contagious disease, and is cared for, his fellow students are kept from exposure; and even if he has some constitutional trouble which interferes with his work, it is of advantage to his classmates to have his health improved. The more efficient each student is, the

more efficient will be the work of the students as a body. Since the department of student health was established, in not a single instance has an outbreak of infectious or contagious disease got beyond control so as to become epidemic.

THE COLLEGE OF LETTERS AND SCIENCE

Research work in letters and science is carried on in many departments. For the most part this work is of a kind which is directed to intellectual and social advancement rather than to material wealth. In some departments it is true that the investigations have a financial bearing. For instance, in the geological department, investigations upon the iron ores have been of direct help in the discovery and exploitation of these ores within the state. Similarly, studies in the lead and zinc district have assisted in the development of that district.

Iron Ore

While it is not easy to point out how investigations in such departments as political economy, political science, history, and sociology bear upon the economic and social development of the state, it is certain that the studies that have been made by these departments have been practically applied in various ways to the benefit of the commonwealth.

The investigations of the College of Letters and Science also go into fields which pertain to the intellectual advancement of the race; but such advances cannot be regarded as of less importance than those which relate to material wealth, since all material wealth is to assist man in reaching a higher plane of living.

INSTRUCTION BY EXTENSION

The discovery of knowledge during the past fifty or sixty years has far outrun the assimilation of the people. We know enough about agriculture, so that if the knowledge were universally applied, the agricultural products of the state could be very largely increased. We know enough about medicine so that if this knowledge were applied, infectious and contagious diseases could be practically eliminated within a generation. Similarly with regard to other lines of knowledge. This situation creates the great problem of getting the new knowledge discovered in this and other countries to the people. This is the purpose of the university extension movement which has developed in this state upon a greater scale than anywhere else in the United States. It is the aim of the University to assist the people of the entire state. The work in extension is carried on under the organizations of University Extension and Agricultural Extension.

Knowledge for the Entire State

UNIVERSITY EXTENSION

Throughout the state there are many men and women who would be glad to take work in some part of the regular educational system, but they are engaged in vocations which render this impracticable; and especially is this true for many who wish to take work of university grade. All such individuals may continue their education under the university extension system. They are thus able to satisfy their instincts and impulses for self cultivation along practical, theoretical, or cultural

Education for Everybody

lines. In order that the past experience and accumulated wisdom of the race may be made effective to the entire state in a large and comprehensive way, the University Extension work has been broadly organized into departments of Correspondence Study, Lecture Study, Debating and Public Discussion, and General Information and Welfare.

Correspondence Study

Method of Instruction

The Correspondence Study Department affords an opportunity for consecutive instruction. Regular courses of study are pursued to their conclusion as in a school or at the University. In correspondence work a systematic set of lessons, grouped into courses, is sent out to each student. These lessons may be either printed or mimeographed. The student does the work assigned in each lesson and sends that work in to the University, where the instructor in charge of the subject makes suggestions and returns the corrected paper to the student. A very important feature of the work is that correspondence students at a given locality are gathered into classes and from time to time meet the instructor; and thus they gain the great advantage of coming into living contact with their teacher.

Wide range of Subjects

A very wide range of subjects is offered by correspondence; indeed the range is almost coextensive with the University. The correspondence work is of two grades,—that which has no relation to university instruction, and that which is of university grade. The students in the former class are largely those in industrial or business subjects. In engineering the courses are planned to give the men the knowledge they need in a direct and practical manner. Many of the men taking these courses have no more than a common school edu-

cation. They are the men in the shops who wish to be better mechanics and who wish to rise to higher positions. At the present time scattered throughout the state there are approximately 3,000 students enrolled in these technical subjects.

Business Courses

The business correspondence courses are taken by many in all ranks in business, from the office boy to the bank official. Each course is adapted to the particular group that undertakes the work. The purpose of these courses is to give specific aid to a man in his business; and also in every course the relation of the particular line to the whole business world is considered, and thus the outlook of the man is broadened.

District Centers

This correspondence work is largely done from district centers. Six such districts are organized at the present time, with headquarters at Milwaukee, Oshkosh, La Crosse, Superior, Wausau, and Eau Claire. For each district there is a head in charge and a local staff.

In District No. 1 (Milwaukee), there were conducted in 1912–13 twenty six lecture-study class groups; in District No. 2 (Oshkosh), twenty seven such groups; in District No. 3 (La Crosse), thirteen such groups; in District No. 4 (Superior), nine such groups; in District No. 5 (Wausau), twelve such groups; or a total of eighty seven such classes.

The number of active correspondence students in 1912-13 was 6,313, or a larger number than took work at the University.

General Information and Welfare

The Department of General Information and Welfare is a medium between the University and the people of the state on matters which concern their

many public interests. This department is organized into several bureaus.

Advice to Cities

MUNICIPAL REFERENCE BUREAU: The Municipal Reference Bureau gives information relating to municipal problems to the city officials of the state and to other citizens. The bureau collects data on all subjects of municipal government,—pavements, sewers, waterworks, street lighting, dust prevention, garbage collection, sanitation, etc., and makes this information available to those who can utilize it. It collects city ordinances and reports and is prepared to give advice and information on the various subjects of municipal regulation, such as the censorship of moving picture films, building codes, and the handling and sale of milk. The bureau makes special investigations and reports for specific subjects, such as commission government, the city manager plan, municipal fire insurance, and uniform accounting.

The Use of the School House

CIVIC AND SOCIAL CENTERS: The Civic and Social Center Bureau is devoted to developing and improving the life of the community by making the school houses centers where the people can meet together to discuss their common problems and promote a community conscience upon public questions, as well as to develop a feeling of social unity through acquaintance and fellowship.

Health of the People

HEALTH INSTRUCTION: The Health Instruction Bureau is devoted to the dissemination of information relating to public and personal health. What is chiefly needed in a matter which touches people so intimately and vitally as health, is information to displace ignorance. Traveling health exhibits are displayed at institutes, fairs, conventions, schools, libraries, etc. General health information is offered through easily comprehended charts, models, photographs, cartoons, catchphrases, stereopticon,

and cinematograph. Bulletins on infant mortality and care of the baby, preventable disease in general, rural hygiene, insanity, and contributory diseases are in course of preparation.

The health program will be extended as rapidly as means permit. Nearly one-half of all Wisconsin newspapers have requested and are being furnished with a weekly press bulletin service on questions of personal and public hygiene.

Cultivation by Music

COMMUNITY MUSIC: The Bureau of Community Music proceeds on the theory that every community has musical talent which only awaits development and that nothing more readily appeals to the best in humanity than music. From the earliest times music has played a great part in social development. That its power still remains is shown by music's hold on people that have cultivated this activity, such as the Welsh, the Germans, and the Scandinavians.

Helping a Community

COMMUNITY INSTITUTES: All of the bureaus mentioned have combined in the presentation of truth upon one or two topics in what are called community institutes, social service institutes, and welfare exhibits. The former are three or four day meetings at high pressure to bring to a focus the community consciousness upon some of its problems. The endeavor is to fit into the program of an institute two or three of the most pressing problems of a community, and produce such a vivid impression that permanent effects may remain through the community itself taking active measures for amelioration of objectionable conditions.

The Social Service Institute is adapted to work in the larger cities where special social service training is demanded, in connection with relief of poverty, social service hospitals, and juvenile delinquency.

A welfare exhibit emphasizes a single topic, such as health. A program centers about one topic. Addresses are made vivid by working models, the stereopticon, and moving pictures.

Debating and Public Discussion

Debating an Educational Force

The American youth enjoys debating. Throughout the state there have long existed many debating societies. These organizations however had not the material or guidance to make this work truly educational. The situation was seen by the Extension Division, and in 1907 the Department of Debating and Public Discussion was organized. Syllabi have been prepared in regard to the important public questions which are before the people, each one of which presents an outline of the arguments on both sides of the question. Library packages which contain material relating to each of the subjects are made up. These syllabi and packages are sent to the various communities. Illustrating the subjects to which these syllabi and packages relate may be mentioned woman's suffrage, the income tax, commission government of cities, taxation, immigration problems, parcel post, initiative and referendum, the recall, government ownership of railroads, postal savings banks, the minimum wage, etc. Among the more recent syllabi prepared are those upon the Panama tolls, Philippine independence, and intervention in Mexico. Furnished with such material the members of a society are enabled to make a thorough study of the subject which they select, and thus the debating society becomes a great educational force.

Instruction by Lectures

The form of university extension first introduced into this country and into this University was that of instruction by lectures, under which members of the faculty went out to various parts of the state, and each gave a lecture or set of lectures upon some subject. Recently this line of work has been greatly expanded; and, also, the department has been used as a clearing house through which lectures and entertainments by others than the regular university staff have been arranged. In order to meet the diversified tastes of the audiences, it has been found desirable to include musical and other entertainments as features of lecture courses. The lectures themselves are often illustrated, and are made as popular as possible without loss of quality.

General

Number of People Benefited

It has already been noted that more than 6,000 students are doing work by correspondence. It is estimated that for 1912–13, the attendance upon debates and public discussion carried on with the cooperation of the University amounted to about 85,000. Through the Department of General Welfare, it is estimated that 35,000 people were reached. Upon the lecture courses there were in attendance about 150,000 people, of which number 50,000 came directly under the influence of men on the university lists.

Bringing the above results together, we find that the number of people reached by general extension in 1912–13 was approximately as follows:

Correspondence	6,000
Lectures	50,000
Debating and public discussion	85,000
General welfare	35,000
Total	176,000

The above does not include those who attended lectures and entertainments given by outside agencies which were arranged for by the Extension Division. This number is estimated at about 100,000.

AGRICULTURAL EXTENSION

The work in agricultural research has already been described; but this is only half of the work of the College of Agriculture. It is not sufficient to make a discovery in agriculture; it is necessary to get the results of the discoveries to as large a number of people as possible. Consequently the agricultural extension service has been organized. This work may be classified as follows: Departmental demonstration work, the county agricultural representative system, and collective instruction.

Departmental Demonstration Work

Dissemination of Improved Grains: When improved varieties of farm crops have been developed by long continued breeding, it is of the utmost importance to disseminate them widely among the farmers of the state. The best results can only be secured by placing the seed in the hands of properly trained men who will keep the crop up to its standard of excellence.

WISCONSIN EXPERIMENT ASSOCIATION: The Wisconsin Experiment Association, a unique organization which now numbers over 1500 farmers who are graduates of or who have attended the courses at the College of Agriculture, has been a most valuable medium for the dissemination of the pedigreed grains developed at the station.

Distribution of Seed

By placing small quantities of a new variety of seed with members of the association for growth on their farms, the amount of seed available for Wisconsin farmers increases by leaps and bounds, until carloads of pedigreed grains can be supplied to farmers not only of Wisconsin but of the entire country. The members of this association are now undoubtedly selling over $1,000,000 worth of pure bred seeds annually.

CORN GROWING CONTESTS: The dissemination and use of the high bred seed has been carried on in many other ways. One of the methods which has been very successful is that of conducting young people's corn growing contests. In 1913, forty-four of these contests were held in forty counties of the state. Over 9,000 lots of Wisconsin No. 12 corn, nearly 2,700 of No. 7 corn, 2,175 of pedigreed barley, 6,600 of oats, and 1,066 of alfalfa were thus sent out to school children in the state.

BANKERS' SEED CONTESTS: Another method of distributing seed has been through the bankers' pure bred seed contests, which have been organized by the bankers of the state through cooperation with the College of Agriculture.

The Farmer Learns by Seeing

DEMONSTRATION FARMS: Another line of extension work is that on demonstration farms, fields, and plots. These crop demonstrations have been carried on in connection with county asylum farms, the county demonstration stations, etc. Among the important lines of work conducted at these farms

are liming and inoculation tests with alfalfa, demonstrations of methods of weed eradication, treatment of grains for disease, conservation of farm manure, and variety and cultural tests with corn and small grains.

County demonstration stations, supported jointly by the county and the state, have been established in the northern part of the state upon the different types of soil there found. The work carried on in these stations deals especially with the crops best adapted to the particular locality and soil.

For a similar purpose cooperative work has been carried on with about two hundred of the farmers of the state, in order to determine the best methods of managing the soils.

In all this demonstration work, at the harvest time for any year, the results are presented to the farmers of the neighborhood who are gathered together for the purpose. The next year the more progressive farmers are likely to introduce new seeds and methods on their farms and thus directly profit through the demonstration work.

DAIRYING AND LIVE STOCK: The extension work in dairying and live stock includes butter and cheese scoring exhibitions carried on at Madison, official tests of dairy cows, and assistance in community live stock breeding. In 1912-13 there were over 1,200 samples of dairy and cheese products scored from 241 exhibitors. More than 5,000 official tests of dairy cows belonging to 200 farmers were made. In the eradication of animal diseases much work has been done. Farmers and students are taught to apply the tuberculin test; and in a six-year period in Wisconsin over 350,000 cattle were tested. The Agricultural College has assisted in

Elimination of Cattle Tuberculosis

this work by providing during the past two years over 110,000 doses of tuberculin.

Hog Cholera Serum

The widespread distribution in the state of hog cholera during the last three years has led to the manufacture at the college of the protective serum against this disease. Last year 450,000 c. c. of serum were prepared and sold at cost. The results which have been secured in the use of this preventive agent have already saved many thousands of dollars to the farmers of the state. With the increased facilities for serum production, which were provided by the last legislature, it is expected that the station will be able to manufacture serum with sufficient rapidity to meet the demands of all the farmers of the state.

County Agricultural Representative System

The Farmers Helped Individually

In 1911 a new line of extension endeavor was inaugurated through the establishment of county agricultural representatives. These men represent the college in a number of the counties of the state. Though specially trained, the men do not pose as experts in all things agricultural. The agricultural representatives visit the farmers in their respective counties throughout the growing season; during the winter carry on short courses in agriculture (practically continuation schools) for the farm boys; and also give agricultural instruction in the county training schools for rural teachers. This work has been supported jointly by county and state appropriations; and beginning this year the work is receiving aid from the United States government.

The success already attained by the county agricultural representatives has created a demand for a rapid expansion of the system. The work was begun in Oneida County in February, 1911, and

Eau Claire County was added during the same fiscal year. In 1912–13 representatives were appointed in Barron and Price Counties, and during the past fiscal year Langlade, Lincoln, Taylor, Vilas, and Forest Counties have been added. Arrangements have already been completed for the location by next August of a representative in Polk County, the tenth county to be organized.

Improvement of Community Ideals

While in the main the work of the county agricultural representatives is along the lines of improvement in farming practices, yet they form an excellent nucleus for the improvement of community ideals; and the educational relation which they assume to the public school system of the counties is important. The wide service of the county agricultural representatives has led to general appreciation of this work. The present law authorizes the extension of this system from ten counties this year to sixteen in 1914-15.

Collective Instruction

Farmers' Courses

Farmers' and women's courses, ten days in length, designed to reach adults who are too old or have not the time to take other university work, were begun at Madison in 1904 with 175 farmers in attendance. In 1913 about 2,000 men and women came to the University from 60 counties of the state. In this way the college reached about one in a hundred of the farmers of the state. To reach another portion of the remaining ninety and nine, similar courses have been conducted in other parts of the state. They are given in connection with County Agricultural schools, and with the colleges and normal schools that are interested in coming in contact with the farmers' problems. This year twenty-three courses were held. In-

cluding the university course, there were 16,000 people in attendance.

FARMERS' INSTITUTES: The Farmers' Institute is really the progenitor of the modern agricultural extension movement. It was first started in the state in 1885 and has been unquestionably of the very highest value in the agricultural improvement of the state. About 130 two-day institutes are held each year. The needs of the women on the farm are cared for in about 40 cooking schools. The total attendance at these meetings in 1913 was approximately 65,000.

FARMERS' SCHOOLS: These are one-week schools in which definite instruction consisting of laboratory operations is given in two agricultural subjects, or home economics. This work was begun in 1911, five schools being held that year. Nine such schools with an attendance of 460 were conducted in 1912–13, and twelve schools with an attendance of 622 in 1914–15.

EXTENSION IN OTHER WAYS: The work of the Agricultural College has been brought to many thousands of the people of the state through educational exhibits such as those at the State Fair of Milwaukee and by means of trains furnished by various railroads. Others have been helped through the work of the Department of Farm Machinery, illustrated by silo construction, through community potato growers' associations, and in various other ways.

Many thousands of people are reached through publications. The general bulletins and the circulars of information of the Experiment Station are published in large editions and widely distributed throughout the state. The number of bulletins distributed each year aggregates 300,000.

Finally, a great number of farmers are communicated with and advised by letter. The number of farmers reached through such assistance aggregates 60,000 per annum.

Number Reached by Agricultural Extension

The total number of people, estimated upon a conservative basis, who are reached each year by the various lines of Agricultural Extension is shown by the following table:

Inspection service	4,000
Dissemination of pure bred grains	31,000
Demonstration farms, fields, and plots	8,800
Dairying and live stock	1,700
Potato growing	1,500
Farm mechanics	5,200
Disease eradication	3,800
County agricultural representatives	17,800
Extension instruction	150,000
Total	223,800

This total does not include the great number of farmers who receive bulletins and are assisted by letter for the reason that many of these farmers are also included in the above list.

THE STATE LABORATORY OF HYGIENE

Public Health Work

Another line of work at the University related to extension, in that it is for the benefit of the people as a whole, is that of the State Laboratory of Hygiene. This laboratory has as its object the assistance of physicians in the state in the control of epidemic diseases. A prompt diagnosis in the

case of contagious diseases is of the utmost value not only for treatment of the individual but to prevent spreading. Therefore, the general object of the laboratory is public health work. In this laboratory free examinations are made for health officers, physicians of the state, and veterinarians, for the diseases of tuberculosis, diphtheria, rabies, anthrax, etc.

As showing the importance of the work of the laboratory a few illustrations are given

Typhoid Fever

It was demonstrated some years ago that from a single drop of blood, sent any distance, a properly equipped laboratory could tell with certainty whether or not the person from whom this drop of blood was taken was suffering from typhoid fever. This is done by the application of the Widal test. The laboratory sends out properly prepared outfits for the collecting and sending of blood through the mail from patients suspected of having typhoid fever. As a rule, within two hours after the receipt of a specimen at the laboratory a message is on the way to the physician giving him the laboratory determination. Also the laboratory prepares anti-typhoid fever vaccine which is distributed free of charge to all the physicians of the state. This vaccine has proved wonderfully efficacious in the control of typhoid fever epidemics.

Pasteur Treatment

The Pasteur treatment for the prevention of rabies is administered by the laboratory. Examinations of public water supplies are made by health officers.

These few illustrations show how important the work of the laboratory is in controlling and eliminating contagious diseases in the state. The amount of the work of the laboratory has rapidly increased in recent years. In 1904-5, the first year the laboratory was established, the number of

tests made was 644; in 1912–13, 6,479, or more than ten times the number the first year. The number for 1913–14 will exceed 8,500.

Number Benefited

Since every laboratory test must affect at least one family, averaging five persons, it is estimated that the State Laboratory of Hygiene at the minimum is a benefit to thirty or thirty five thousand people within the state; and. the real number, which however cannot be accurately gauged, is probably several times this number.

INSTRUCTION AT MADISON

The instructional work at the University is organized as follows:

The College of Letters and Science,
The Medical School,
The Law School,
The College of Engineering,
The College of Agriculture,
The Graduate School,
The Summer Session.

The work done in these various colleges and schools is that of general education and preparation for specific careers.

THE COLLEGE OF LETTERS AND SCIENCE

The Trunk and Branches of the University

The College of Letters and Science is the trunk of the University. Until thirty years ago, with the exception of the beginnings of one or two of the professional schools, it constituted the University. Out of this college have grown as branches the various professional schools, some of which have been organized as independent colleges and others of which still remain in the college as definite courses.

The number of students in the College of Letters and Science in 1903–04 was 1,325; in 1913–14 it was 2,653. These numbers show that the attendance in this college has doubled in ten years and that the college contains about one-half of the students of the University.

The College of Letters and Science is the college which does the general educational work of the University, both for the students registered in that college and for the students in the professional schools. Also in the College of Letters and Science there have been organized a number of professional courses which in other institutions are usually organized as separate schools and colleges.

General Educational Work of the College

Scope of College

The general educational work of the College of Letters and Science represents the higher side of that "education" which our fathers had in mind when they framed the Ordinance of 1787 and united education in one phrase with religion and morality as "necessary to good government and the happiness of mankind." It constitutes that part of the provision for the care of the spiritual interests of the community which the Ordinance directly assigned to the state. It represents the type of education which a later generation sought to establish by the land grants of 1838 and 1854. In the early years of the University this work as already noted was predominant over all other parts of the institution, and it still constitutes by far the largest division of the University. The central influence of this work is on the social side. The college must be first seen from this side, or it will not be seen in its right proportions and will be correspondingly misjudged.

The primary duties of the College of Letters and Science are (1) to represent scholarship and higher education in a manner worthy of the state and the nation; (2) to maintain and enforce the ideals of scholarship in the community and so to foster and stimulate its intellectual life; (3) to offer to the

youth of the state a direct path to the higher learning and so to encourage among them the love of learning as "necessary to the happiness of mankind"; and (4) to contribute to the advancement of learning through its faculty, and to train for this purpose youth who show promise of the ability to add to knowledge.

The College of Letters and Science must, therefore, be judged primarily by the men and women whom it has trained and sent out to share and to influence the life of the state, rather than by any direct contributions to the wealth of the people, or by graduates trained for specific service to the public. The other colleges of the University make a similar contribution to society; yet they have as a primary purpose, if not their main function, to yield to the state economic advantages, or graduates technically trained. These colleges may justly refer to these economic or technical matters as specific points by which they may be judged. While the work of the College of Letters and Science has also this side, the college cannot be judged by it. Its contribution is primarily to the people rather than to their work or their wealth. Those persons who know the state know also the thousands of alumni of this college. They further know those other thousands who without having gained a degree have studied in the college long enough to catch something of its life and spirit. The influence of these men and women on the thought and life of the state is the justification of the college. If her children do not justify the liberal training of the College of Letters and Science in the eyes of the state, then she has no sufficient justification in other things which she may do; for her children are her largest contribution to "good government and the happiness of mankind".

Training of Men and Women

The Professional Courses

While training toward the higher intellectual life is the fundamental purpose of the College of Letters and Science, this college does a large amount of professional work. This work is organized in the following courses and schools:—

The Course in Commerce,
The Course for the Training of Teachers,
The Course in Journalism,
The Course in Chemistry,
The School of Music,
The Course in Library Training,
The Course in Pharmacy.

Space will not permit consideration of each of these courses; therefore only the work of the larger ones will be here very briefly summarized.

THE COURSE IN COMMERCE: The Course in Commerce was established in 1900 to prepare young men and women to enter business careers.

Training for Business

When this course was established business men in general were sceptical regarding the value and efficiency of such educational efforts. They have had to be shown and convinced. To these ends connections have been made and maintained with industrial and commercial organizations of various kinds as well as with an increasing number of private firms, corporations, and individual business men. Through these agencies it has been possible, in a measure at least, to explain to the business world the character of the work done and to induce it to give the product of the commercial course a trial. The result has been a steadily increasing demand for graduates. Each year the number of firms becomes larger, sending representatives to the University, who wish to employ men trained for com-

mercial work. During the last decade there has not been a year when a much larger number of good men could have been placed than were actually available.

The Course in Commerce is to be justified by its product. The fact, that its graduates have as a rule readily found positions and have been rapidly promoted in the concerns in which they have been employed, and that a large number of them are now occupying positions of responsibility, is evidence of the success of work in commerce in which the University was a pioneer. Also the success of the course is proven by the steady increase in the number of students.

In 1900-01, the year the course was organized, 84 students entered it. Five years later, 1905-06, the number had increased to 222, and in 1913-14 to 396.

Importance of Teachers

THE COURSE FOR THE TRAINING OF TEACHERS: The Course for the Training of Teachers was organized to prepare teachers for the public schools of the state. One third of the teachers in the high schools of Wisconsin have been trained at the University. At the present time the University prepares each year about two hundred teachers for this service. From the time of its foundation the responsibility of the University for the preparation of teachers for the public schools of the state has been clearly recognized within and without the institution. A department for the training of teachers was one of the four departments provided by the Charter of the University. For the betterment and the development of the preparation of teachers, a Course for the Training of Teachers was definitely instituted in 1908. A director of the course was appointed at the beginning of the academic year 1909-10.

The more important results of this course have been: (a) The organization of special courses for teachers in all those university subjects taught in secondary schools; (b) the increase and better professional adaptation of instruction in the Department of Education; (c) the establishment of the Department of Manual Arts primarily for the training of teachers of the industrial arts; and (d) the establishment of a school of demonstration and practice,—the Wisconsin High School.

The Wisconsin High School

The completion of the new building for this school at the opening of the academic year 1914-15 will enable the University for the first time to provide that most necessary part of the preliminary preparation of a teacher, namely, practical laboratory work in teaching. It is the purpose of the University to make the Wisconsin High School as efficient as any in the state, to the end that university graduates will enter the teaching service with high standards in education, and a working knowledge that will make them strong teachers of high school pupils.

Course in Journalism

OTHER COURSES: The purpose of the Course in Journalism is to train men for a career in connection with publication, including newspapers, magazines, etc. The power of the press, daily and periodical, is enormous, and is steadily increasing. Consequently, the training of high minded competent journalists is of great importance in the country. The number of students in journalism is larger than in any of the other special courses except those of commerce and training of teachers.

Course in Chemistry

The Course in Chemistry was organized to train students to become expert chemists. The graduates of the Course in Chemistry include both men and women. These graduates have readily secured positions; indeed the demand for well trained

chemists has been greater than the University could supply.

School of Music

The School of Music serves a twofold purpose,—the general training in music for those who wish to take this subject as one of their liberal arts studies, and the giving of professional courses to those who are preparing themselves to be teachers of music.

Library Training

The Library Training Course, first independently established by the Legislature, was made the Library School of the University in 1909. Its purpose is to train librarians for the duties of this profession in the various cities of the state.

Course in Pharmacy

The Course in Pharmacy, as its name indicates, has as its aim the giving of necessary preparation to those who wish to become pharmacists.

All of these courses have served useful purposes in the state by providing well trained men and women for their various vocations.

THE MEDICAL SCHOOL

Considering the historical relation of medicine to higher education as well as the recent development of medical education in other states, Wisconsin was very slow to take up this essential branch of human knowledge. Studies antecedent to a medical course were offered as far back as 1881; but it was not until 1907 that the Medical School was authorized by the Legislature. To the present time only the first two years of the medical course have been organized. In 1912 a course for health officers was established.

Aims of Medical School

The aims of the Medical School are two fold; first, to advance knowledge in the fundamental sciences on which medicine and hygiene are based; and second, to extend this knowledge (1) to medical students who desire a thorough preparation for their life's work; (2) to students seeking knowledge of anatomy, physiology, bacteriology, or of other basal medical sciences as a part of a special preparation, as for home economics or physical education, or as a part of a general education; and (3) to students who seek medical advice regarding the regulation of their lives so that they may be most efficient.

Since the Medical School was established, the students have steadily increased in number. The question is now acute in regard to their accommodation; indeed the question has been raised whether or not the number of students in this school shall be limited until the departments find additional space in the Science Building at the time when the Department of Physics moves to its new quarters.

THE LAW SCHOOL

Importance of Law Teaching

Ten years ago when the present administration of the Law School was inaugurated, it was the declared policy of the Regents of the University to develop the school along the most approved lines in legal education until it should compare favorably with the best schools in the country in point of efficiency. This was conceived to be the duty of the University in furthering the best interests of the state. Such a policy was dictated by the belief that a supreme concern of the state is justice; that the surest pledge of justice is the existence of an upright and efficient judiciary; and since the

bar is the body from whose ranks judicial and legal officers of the state are chosen, it is the province of the state through the University to assure a high minded and well trained bar by maintaining a law school with thorough standards. Acting on this belief the energies of the faculty and the funds appropriated have been directed to that end. Thus the chief and primary concern of the Law School faculty is instruction, and in discharging these duties efficiently it is rendering the best service to the legal profession and to the state.

THE COLLEGE OF ENGINEERING

Training or Engineers

The principal work of the College of Engineering is the training of men for the engineering profession. It is the particular work of this college to give such training to the young men in Wisconsin. The work done by the college may, therefore, be measured to a considerable degree by the number of students in attendance and the number which have been graduated from its classes. The quality of instruction is perhaps of greater consequence than the quantity, but this is very difficult to measure.

The five years from 1899 to 1904 were years of very rapid growth in attendance, the total number of students in the College of Engineering having increased from 242 to 744 in that period. Since 1904 the number has fluctuated irregularly between 700 and 900, some years showing an increase and some a decrease. The effect of the rapid growth above noted was not fully felt in the upper classes and in number of students graduating until 1908–10. The number of degrees granted increased from 59 in

1903 to a maximum of 140 in 1910, and the average since that year has been about 130.

THE COLLEGE OF AGRICULTURE

Rapid Growth of College

The College of Agriculture, while established in 1867, had relatively few students for many years; and for the Long Course in Agriculture the great growth has been within the past five years. The graduates of the Long Course in early years immediately went into teaching and scientific positions, but an increasing number are now going into farming. The Middle Course, two years in length, was organized in 1908 to meet the needs of students who wished to get a practical course in agriculture in two years. The Home Economics Course furnishes a four-year training that fits for home and professional work. The number of students in this course has quadrupled in four years; it is expanding with greater relative rapidity than any other course in the University. The Short Course in Agriculture, organized in 1885, is for the purpose of presenting to the farm boy a practical education which will adapt him to farm work. Of the graduates of this course, over eighty per cent. are engaged in farming in Wisconsin. The Dairy Course is designed to train students for the operation of dairy and cheese factories. The Forest Rangers Course is to provide for the training of state foresters.

The number of students in the College of Agriculture in these various courses for the years 1913–1914 was as follows:

Long Course	682
Middle Course	135
Home Economics	205
Short Course	450
Dairy Course	155
Forest Rangers Course	28
Total, excluding summer session	1,655

THE GRADUATE SCHOOL

The primary purpose of the Graduate School is to give training for those who are expecting to become teachers, investigators, or scholars in their various fields. Its work is a continuation of the advance undergraduate work of the different colleges; and it includes students in several colleges,—notably letters and science, engineering, and agriculture.

Master and Disciple

The work of the Graduate School closely connects itself with instruction and with investigation. The fundamentals of the method of producing intellectual leaders has not varied from that of the days of Jesus and Socrates. The master gathered a group of disciples about him who assisted him in his work and whom he taught. This is essentially the method of the Graduate School. Many of its members assist the professors in their teaching; many assist them in their research work; the professors lead the men to intellectual independence.

The Production of Scholars

The Graduate School is the apex of the University. While in the sense that the number of students in this school is small as compared with those in the undergraduate colleges, and is therefore much less important; in the sense that the Graduate School produces teachers and investigators who are in the future to teach undergraduate students in this and

other higher institutions of learning and who are to advance knowledge, the school is of the first importance. Also, the university that has a strong graduate school is an efficient university in undergraduate instruction.

No test of the grade of a university is more searching than its capacity to attract graduate students. At the University the growth of the Graduate School has been rapid, especially during the last fifteen years. This growth by colleges for the regular academic year and also attendance in the Summer Session is shown by the following table:

	Letters and Science	Engineering	Agriculture	Total regular year.	Summer Session
1900-01	101	7	5	113	82
1905-06	144	7	7	158	137
1910-11	280	39	28	347	394
1913-14	334	18	85	437	689

THE SUMMER SESSION

The Summer Session, established as a summer school in 1887, was made a summer session of the University in 1899. Since that time the session has steadily grown, both in the scope of its work and in attendance. At first giving instruction only in the College of Letters and Science, the session has expanded so that it now covers not only this college and the various special courses under it, but the Colleges of Engineering and Agriculture and the Schools of Medicine and Law. Thus the entire physical plant of the University is utilized for six weeks

during the summer (for the Law School ten weeks) for all those who wish to do university work.

The Summer Session is taken advantage of by students attending the remainder of the year who in this manner may shorten their courses. Also the session gives an opportunity, which could be furnished in no other way, to those men and women engaged in the teaching profession in the high schools, normal schools, and colleges, who wish better to equip themselves for their instructional work. Substantially the only difference between the Summer Session and the regular session is that the active faculty is reduced in number to correspond with the decreased number of students. In 1913 the number of students for the first time passed the two thousand mark, the total being 2,132.

GENERAL CONSIDERATIONS

It has often been remarked that during the past ten years the cost of the University has much increased. This is true; but the facts presented give an explanation of this increase. The University is doing vastly more for the state than ever before. The University costs much because it does much for the state.

Oftentimes however it is not appreciated how large a part of the income of the University is derived from other sources than the state, nor how large a part of that derived from the state is for general state purposes.

REASONS FOR INCREASED COST

Cost of Extension for Entire State

EXTENSION: An important factor in the larger cost of the University at the present time is that of extension, there being available for the operation of this work during the year 1913–14, $237,380. Ten years ago the only available fund for extension was the small amount for Farmers' Institutes, $12,000. Thus the cost of this work during ten years has increased twenty fold. This expansion has taken place, not for the advantage of the students at Madison, but for the benefit of the state as a whole. It has taken place rapidly because there has been so strong a demand in all parts of the state for expansion of the work. The Legislature, responding to the demand, has increased appropriations from year to year until, as already stated, the amount available for the current year is $237,380.

THE LARGE CAPITAL ACCOUNT: Another factor which is very important in the increased cost of the Uni-

versity has been the necessity for putting a large sum into capital account during the past decade.

Money for Buildings Permanent Investment

By capital account is meant expenditures which are permanent investments. Money invested in new buildings and lands are placed here. Current repairs upon such buildings are not included. Books and apparatus are included in the capital account to the extent that they are a part of the permanent equipment. Expendable material, such as chemicals and temporary apparatus, are carried as operating expenses. In this matter the classification followed by the University is that which is used by the committees of the Legislature.

Ten years ago the University was very inadequately housed. During the ten years the students have doubled; and it has been necessary to add greatly to the number of buildings.

Enlarged Grounds Necessary

Also the Regents saw ten years ago that the grounds were far too small to meet the future needs of a great university; and it was appreciated by them that to delay the expansion of the grounds would result in acquiring land at a very greatly increased cost in the future; consequently, additional grounds have been purchased to meet the probable future needs of the University. In consequence of these facts there have gone into capital account during the ten years 1903–04 to 1912–13 inclusive the following sums:

Buildings	$2,029,837.80
Land	400,570.24
Books and apparatus	918,619.59
Total	$3,349,027.63

The entire capital account to the end of 1912–13 is estimated at $5,247,843.32.

It is a notable fact that the entire cost of all the buildings of the University to the end of the fiscal year ending June 30, 1913, amounting to $3,277,504.85, is somewhat more than one-half of the estimated cost of $6,000,000 for the state capitol building; and that the cost of the entire physical plant of the University, including buildings and equipment, grounds, library, and apparatus together, $5,247,843.32, is less than the proposed cost of the capitol building without furniture and equipment.

In making this statement, it is fully realized that the cost of the capitol building is no more than justified for this purpose in a great state, and that the building is being economically constructed.

The physical property of the University includes 1,350 acres of land, constituting the university campus and agricultural farm; 36 large buildings, 31 of moderate size, numerous very small buildings; the equipment of these buildings, books, apparatus; and the university property in other parts of the state, such as substations.

In considering the expense of the instruction of students at Madison, the amount of capital account is often included. It is no more just to charge this amount to the cost of current instruction at Madison than it would be to charge the state capitol building, costing $6,000,000, as expenses to the state of the officers and legislators who occupied that building during the ten-year period of its construction. The capitol building is an investment made by the state for scores of years, probably centuries, to come. The capital account of the University is of the same class, since the lands purchased will last forever; and all of the important buildings which have been constructed during the past decade are of a permanent reinforced concrete type, and they should endure for hundreds of years.

The Students Contribute to the Cost

THE CONTRIBUTIONS OF STUDENTS: Of the income of the University a large amount is derived from the students. During the decade the non-resident fees have been increased twice by the Regents; that is, from $30 in letters and science and agriculture, and $40 in engineering and pharmacy to $70 a year in addition to the incidental fee; and the last Legislature made a further increase of these fees to $100 per annum. For 1902–03 the student fees were $104,296.61. For the year 1912–13 there were derived from student fees $382,241.15; and this sum will be increased by many thousands of dollars next year. Thus the student fees in ten years have increased more than three fold or by $277,944.54, and, therefore, to a very considerable extent the increased cost of the University has been borne by the students.

FUNDS FROM BUSINESS TRANSACTIONS: A considerable portion of the receipts of the University result from business transactions, such as from the purchase of milk and the sale of butter and cheese. The business transactions on this account amounted to $164,146.97 for the year 1912–13.

CONTRIBUTIONS FROM FEDERAL GOVERNMENT: Another source of money is the Federal Government from which $80,000 a year has been derived for a number of years, and which amount will be increased next year because of the passage of the Lever extension bill.

GIFTS AND INTEREST ON INVESTMENTS: From the interest on the university fund and from gifts considerable amounts of money are obtained. These sums in 1912–13 aggregated $43,119.71.

DISTRIBUTION OF RECEIPTS

All of the above factors should be taken into account before a proper conception can be had regarding the amount of money which is spent for the instruction of the students at Madison and for research which is there carried on. To make the situation still more specific there is presented a statement of the receipts and the distribution of the receipts of the University for the year 1912–13.

RECEIPTS OF THE UNIVERSITY 1912–13:		
The total receipts of the University for the year 1912–13 amounted to		$2,148,476.39
Add to this		230,387.30
derived from the accumulated balances of previous years, gives a total of		$2,378,863.69
Of this amount there were received from the following sources:		
Students	$382,241.15	
Sales of various kinds	164,146.97	
Federal government	80,000.00	
Investments	31,874.54	
Gifts	11,245.17	
Total from other sources than the state		669,507.83
Amount received from the state		$1,709,355.86
Of the total amount expended, there were spent for university extension work, agricultural extension, and farmers institutes	$213,714.52	
For the hygienic laboratory and the forest products laboratory	16,487.30	
Total		230,201.82
The above amounts were spent entirely for the benefit of the citizens of the state as a whole. Subtracting this amount, leaves for expenditures at Madison		$1,479,154.04
Of this sum there were spent for permanent improvements, including new buildings, land, books, and apparatus		582,357.14

The money spent in any year for capital account should not be charged against the students who are attendant upon the university during that year. It is permanent investment to be used for the students during many succeeding years.

Thus the amount derived from the state at Madison for the instruction of the students and for research work is..... $896,796.90

Contribution of State

It appears from the foregoing statements that the instruction of the thousands of students at Madison and of the research work done for the state as a whole cost the state for operation and maintenance in the neighborhood of a million dollars per annum. The other contributions to the state are exclusively for general state purposes, like those of extension and the laboratory of hygiene, or are for the capital account of the University available for service through centuries to come.

THE GROWTH OF TEN YEARS

The growth of the University during the past ten years has been very great; indeed more rapid than ever before. This is shown not only by the increase in students attending the University, but by the number of degrees granted.

Increase in Students

During the past ten years the students attending at Madison have more than doubled. In 1903–04 in all departments of the University the number of students was 3,164; for the year 1913–14 the number is 6,765. As showing the range of the work of the students and the growth of development the following table is inserted.

Table showing number and distribution of students at beginning and ending of a decade

	1903-4		1913-14	
Graduate School..... *Not carried to total because included in lists below.	115*		437*	
College of Letters and Science.....	...	1,325		2,653
Included in the above are the following:				
Course in Commerce.....	177		396	
Course in Philosophy.....	65		45	
Course in Journalism.....	...		88	
Course in Pharmacy.....	33		40	
Course in Chemistry.....	...		73	
Course for Training of Teachers.....	...		387	
College of Engineering.....		744		738
College of Agriculture.....		60		1,022
Long Course.....	60		682	
Middle Course.....	...		135	
Home Economics.....	...		205	
Medical School.....		.....		82
Law School.....		201		169
School of Music.....		172		95
Wisconsin Library School		...		43
Total.....		2,502		4,802
Deducting twice counted....		76		116
Net total. Regular Session.....		2,426		4,686
Summer Session.....	400		2,132	
Deducting those who returned in fall.....	127	273	686	1,446
Additional Enrollment, College of Agriculture.....		465		633
Short Course.....	310		450	
Dairy Course.....	155		155	
Forest Rangers Course.....	...		28	
Grand total.....		3,164		6,765

Without commenting in detail upon the above table, the following points are noticeable:

First, is the great growth in a decade of the College of Letters and Science, from 1,325 to 2,653. Also in this college the Course in Commerce has

greatly increased in numbers; and the Courses in Journalism, Chemistry, and Training of Teachers have been organized. However, the greatest change is in the College of Agriculture, the students of which college, meeting the regular requirements for entrance to the University, have increased from 60 to 1,022. In this college the Middle Course and Home Economics Course have been organized. The College of Engineering, with fluctuations, has remained substantially stationary. The Medical School has been organized. The attendance in the Law School has somewhat decreased; but this is explained by the entrance requirements being advanced by two years of college work. The number in the School of Music has decreased; but this has been due to the elimination of students not of college grade.

The Number of Degrees Granted

But perhaps the most striking evidence of the growth of the University and the importance of its work during the past ten years is furnished by the number who have completed their courses and taken their places in the various communities of the state and the country. The facts in this respect are shown by the number of degrees which have been granted. The table below gives the number of degrees granted to December 31, 1903; for the decade from December 31, 1903 to December 31, 1913; and the totals to December 31, 1913.

Table showing number of degrees granted

	From 1854 to Dec. 31, 1903.	From Dec. 31, 1903 to Dec. 31, 1913	From 1854 to Dec. 31, 1913
First Degrees	5,087	4,964	10,051
Master	219	671	890
Engineer	58	163	221
Doctor of Public Health	.....	1	1
Doctor of Philosophy	57	176	233
Totals	5,421	5,975	11,396

Half of Work in Ten Years

From this table it appears that the number of degrees granted by the University during the past ten years is 5,975. This is greater than the number granted from the foundation of the University to ten years ago. Since the instructional work is roughly in proportion to the number of degrees granted, it is probable that the absolute quantity of instructional work done at the University during the past decade is about equivalent to that which was done throughout its history to 1903.

The above statement does not include the degrees granted for the first half of the calendar year 1914. To July 1st of that year there were granted 795 degrees, of which 621 were first degrees; 112, masters; 39, engineers; and 23, doctors of philosophy.

There is probably no better gauge of the value of the work of an institution than the number and character of the degrees which have been granted. An examination of the above table shows that the number of first degrees for the past decade is not quite as large as the number for the previous history of the University. For the masters degree and

that of the professional degree of engineer, the number in each case is three times as great for the last ten years as during the previous history of the University. The degree of doctor of philosophy is the highest degree in course. It is the one which more than any other represents the stage of development of the University in the advancement of knowledge in the world. It is significant that for this degree also, as well as the other advanced degrees, three times as many have been granted during the past ten years as were granted from the foundation of the University until ten years ago.

CONCLUSION

In conclusion it may be said that the cost of the University, although large, is more than justified by results. The state has been liberal to the University; but the University in turn has rendered rich service to the commonwealth. It is safe to say that if the state had been less liberal to the University than it has been in the past, today the state would be poorer in consequence. In short, appropriations by the state for the University have been investments which have been returned manyfold and will continue to be returned in the future in even larger measure. Can any other investments made by the state show larger dividends even from the material point of view?

University Expenditures Investments giving large Returns

However, it is not from the material point of view primarily that the University is to be judged. It is the fundamental purpose of the University to train men and women so that they will be powerful factors in the advancement of the commonwealth.

It has already been pointed out that the College of Letters and Science is the trunk of the tree of the University and that the schools of applied knowledge, whether organized as separate colleges or courses in the college of liberal arts, are the great branches which have sprung from this trunk. The close relations between the college of liberal arts and the schools of applied knowledge are most fortunate, in that it has given to the students in the vocational schools something of the spirit of that college.

Until rather recently the law, medicine, and ministry have been regarded as the only learned professions. Now that engineering, agriculture, home economics, etc., are taught as sciences, they have become professions. These vocations, in former

Many Vocations Professions

times were essentially manual arts. Now that they involve training in the fundamental sciences, the emphasis in these vocations is transferred from manual to mental work. Thus the Babcock test does not simply give material wealth; but because it requires an understanding of scientific methods as applied to dairy products, it gives to the dairymen a broader intellectual life. Similarly, household duties, which of necessity involve endless repetition of the same things, become more interesting when placed on a scientific basis.

It is the aim of the University not only in its college of liberal arts, but in all its schools of applied knowledge to give men and women, trained both at Madison and through extension, a broader intellectual horizon. These men and women contribute to the intellectual advancement of the state. They not only increase its wealth, but they turn the wealth into social channels. For the highest social development material prosperity is essential.

The Central Purpose to Train Men

Therefore while the material annual gain to the state due to the University amounts to many millions of dollars, these gains however large are subordinate to its work in developing thousands of men and women for service to the state and nation. All materials produced by men are for men. If, then, the University were to add material wealth to the state and neglect her citizens, it would leave unperformed its most important function. The development of well-trained, efficient, high-minded men must ever be the central purpose of the University. They are indeed the soul among its creations, without which all else is of no avail. Such men are found throughout the state. In no small measure the prestige of Wisconsin among the commonwealths of the United States is due to their work.