

THIRD ANNUAL REPORT

OF THE

BOARD OF TRUSTEES

OF THE

ILLINOIS INDUSTRIAL UNIVERSITY,

FOR THE ACADEMIC YEAR

COMMENCING SEPT. 13, 1869, AND CLOSING JUNE 4, 1870.

WITH A REPORT OF THE

AGRICULTURAL LECTURES AND DISCUSSIONS,

AT

CHAMPAIGN, CENTRALIA AND ROCKFORD, Etc.

SPRINGFIELD:
STATE JOURNAL PRINTING OFFICE.
1870.

"If the great benefits of scientific training are sought, it is essential that such learning should be real—that is to say, that the mind of the scholar should be brought into direct relation with the fact; that he should not merely be told a thing, but made to see, by his own intellect and ability, that the thing is *so*, and not otherwise."—*Huxley*.

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"Our nineteenth century is the age of tools."—*Emerson*.

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Recording Secretary—PROF. W. F. BLISS, Champaign.

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Military Committee—BRAYMAN, SCROGGS, McMURRAY, E. L. BROWN, KILE.

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ERRATA.

On page 269, last line before title "Highways," for "eminent," read "ermined."

On page 278, first line of second paragraph, for "stated periods," read "statute provides."

On page 278, in fourth line of second paragraph, for the words, "after the expiration of," supply "within."

INTRODUCTORY.

To His Excellency JOHN M. PALMER, *Governor of Illinois:*

In accordance with my duties as Corresponding Secretary of the Board of Trustees of the Illinois Industrial University, I submit herewith their Third Annual Report, including the Proceedings of the Board of Trustees and of their Executive Committee, and Reports of the Agricultural Lectures and Discussions held at the University, at Centralia and at Rockford, during the past year.

The Treasurer gives a full financial exhibit on pages 85, 86 and 87, covering the year of the report.

During the year covered by this report, as may be seen by reference to the circular and catalogue, 8 professors, 2 non-resident professors, 5 teachers and assistants of professors, and 4 assistants on the farm and in the garden and shop, have been employed; 180 students are enumerated on the catalogue, representing 46 of the 102 counties of Illinois, and 8 other States. Classified according to the studies pursued, 61 are in the Agricultural Course, 49 in the Elective, 43 in the Mechanical, 19 in the Military, and 8 in that of Civil Engineering.

The current academic year—no report of which is included in the following pages—has opened under very hopeful auspices. The number of students is increased to over 200, representing 50 counties of Illinois, and 7 other States; and the single building used for dormitories, recitation rooms and cabinets, is already crowded to overflowing. Students are occupying the basement rooms, in the want of better, at some risk of health. Thirteen teachers are obliged to make the best shift they can, with 8 recitation rooms, so limited in their capacity that some of the larger classes must recite in installments, and professors are compelled

to teach the same lessons twice. The time has already arrived when a large extension of the capacity of the University seems necessary, to furnish proper means of culture to the young men and women of our State who desire the "new education," which it is the duty of the Industrial University to furnish.

A committee appointed by a convention held at Bloomington in March last, to visit the Illinois Industrial University, and report upon its management, state that on the 20th and 21st of September, 1870, they found 194 male students and 14 female students in attendance, and that the classes were composed about as follows, each student pursuing three or more studies :

History : taught by lectures to all the students.	
Agriculture and Horticulture.....	50
Mechanics and Civil Engineering.....	54
Chemistry.....	65
Comparative Anatomy.....	15
Mathematics.....	138
Military Tactics.....	23
Commercial.....	50
English Literature, etc.....	92
German.....	63
French.....	27
Latin.....	20
Greek.....	0

These figures, made by gentlemen outside the University, are given because the statement has been repeatedly made and believed that the Trustees of the University were perverting its funds to uses not intended by the Congressional grant, and were teaching the ordinary collegiate studies in the old way.

Only a visit to the institution is needed to dispel these fallacies. While it is not hoped, nor can reasonable be yet expected that all the proposed and desirable ends have yet been secured, it is apparent to the visitor that the institution is tending in the right direction. The Latin and Greek languages, which occupy a chief place in our ordinary colleges are perhaps studied less than they deserve. German and French, as of greater practical importance, not only as means of communication, but as containing a large mass of scientific and agricultural literature, are largely studied. The important relation which chemistry sustains to agriculture

and the mechanic arts, is recognized in the interest that crowds the somewhat contracted limits of that department, with students. The advanced class in chemistry nearly fills the 24 tables of the working laboratory, and the new class of nearly 50 members overflows the recitation room, and will soon need a place for work. Agriculture and mechanics, besides being made the objects of direct study in the class-room, are being extensively illustrated and taught in the fields and shops. A large experimental orchard, comprising 1,200 varieties of apples, is already planted and growing thriftily; 400 varieties of pears, besides varieties of peaches and other fruits, are propagating for farther planting, and will be ready by the time the sites on which they are to be planted can be properly ameliorated by drainage and tillage. A green-house already been two years in use, and a larger glass structure has just been finished which is expected to receive some liberal donations of valuable exotic plants, especially those known in commerce—such as the Date, Sago and Fan Palms, Pine Apple, etc. A large collection of young forest trees of the more valuable species, for lumber, etc., has been made in the nurseries. These, as they attain sufficient size, are to be transplanted into permanent plantations, to test the values of the different species for this purpose. The experimental grounds are still under process of preparation by thorough tile-draining, which is being done by student labor. Two large and convenient barns have been erected on the experimental and stock farms, with due regard to economy and thoroughness of construction.

In the somewhat crowded space of the shops, the mechanical students are not only performing a limited amount of labor as a means of instruction, but are furnished with remunerative employment, which might be indefinitely extended by an enlargement of the shop, and furnish facilities for other work. At present these students are engaged in the making of patterns for founderies, stuff for picture frames, and the frames themselves, and have lately finished the work of fitting and putting up the steam heating apparatus in the University building, at a total cost of material, freights, etc., of \$1,469 83, being more than \$500 less than the amount appropriated by the Executive Committee for the purpose, and more than \$3,500 less than the amount for which responsible parties were willing to contract to do the work. The zeal and inter-

est shown in this department enforce the importance of giving it the aid which the Board of Trustees asked two years ago, but which the General Assembly did not consider it best to grant. It seems specially desirable that the State or private munificence should furnish the requisite presses, types, etc., for a printing office and bindery, which would furnish farther employment for students, and economise the expenses of the University. R. Hoe & Co., of New York, have presented the Cornell University with a steam cylinder press valued at \$3,250. The example is worthy of imitation; and the fact of an University press at Cornell to-day, whose foreman, compositors, pressmen and engineer, are all matriculated students, and whose work is done well, proves that the idea is practicable.

Thus far, I have spoken of the work of the University, and its wants in the direction of teaching and furnishing the means of self-support to the young men and women who are thronging its lecture and recitation rooms. It may be proper, also, to say somewhat of a work not less important, but hitherto somewhat impracticable. I mean that of *originating knowledge*—especially in agriculture—by observation and experiment, and the ultimate elimination of a science of agriculture from the facts so collected. The charter of the University looks to this, and makes it the duty of the Corresponding Secretary of the Board of Trustees to issue circulars, directions for procuring needful materials for conducting experiments, and eliciting instructive information from persons in various counties, selected for that purpose, and skilled in any branch of Agricultural, Mechanical and Industrial Art; and to do all other acts needful to enable him to prepare an annual report regarding the progress of the University in each department thereof—recording any improvements and experiments made, with their costs and results, and such other matters, including State, industrial, and economical statistics, as may be supposed useful. The desirability of doing all this, is sufficiently manifest. There has been on the part of the State Agricultural Society, and of the State Board of Equalization, urgent and repeated requests made for statistics; and the importance of experimentation, if less urged, is still strongly felt. But if there be no power to *require* statistics, the duty of collecting them can avail little, and must be limited to recording and reprinting what has already appeared elsewhere.

Hence, it has not been deemed desirable to attempt the collection of statistics until increased powers were given for their collection, by placing the collection of State statistics in the hands of the Corresponding Secretary, or of the State Auditor, or of a Commissioner of Statistics, and requiring such statistics, so far as industrial, at least, to be made a part of this report.

In instituting experiments, we have to face some facts which we are assured by those of more experience, render experiment difficult. Those who heard the lecture of Dr. Manly Miles, Professor of Agriculture in the Michigan Agricultural College, given at our last State Fair, on Experimental Agriculture, will remember how, himself an experimenter of many years experience, he warned his listeners of the lack of any value in nearly all the experiments hitherto made, from the want of care in the experimenter. To make experiments of any value requires skill and intelligence, great care in avoiding fallacies, singleness of purpose in any given experiment, and great accuracy of detail. This brings us to the conclusion that the kind of experiments wanted require skilled persons to conduct them, and demand more time and expense than many can or will afford, gratuitously. We are brought, in short, to the conclusion, that we should have Agricultural Experiment Stations, at the University and in different parts of the State where chemical, physiological, agricultural, and other observations and experiments can be carried on with uniformity, continuity and exactness. Each of these stations should comprise a tract of ground and suitable buildings, donated to the State for the purpose; and the State should grant an annual appropriation of \$2,000 or \$3,000 to each, to pay the salary of a suitable superintendent and the wages of laborers. For further information as to the value of these Experiment Stations, I need only to refer to the testimony of such men as Liebig, Pugh and Johnson, who commend them as the best means yet discovered for forwarding agricultural investigation.

In view of difficulties such as these, and of the insufficient means for doing all that it was desirable to do, I have been expected to confine the expenditure for collecting material for my annual report to a limited amount, and have had to depend upon circulars and the Annual Agricultural Lectures and Discussions in different parts of the State for such facts of experience as are

here presented. But it is earnestly to be hoped that, with more completeness of the improvements on the experimental farm, and less continuous and exacting demands of preliminary work, that proper experiments and observations may be commenced at the University, and farther means be spared to be spent in this direction. In saying this, however, I would by no means underrate the importance of the annual gatherings of the farmers of the State begun under the auspices of this University. They have a high value as a means of gathering facts and disseminating knowledge of the best practices in the art of agriculture, and are a great stimulus wherever they go.

Among the observations and experiments desirable to be instituted, and for which no sufficient provision has been yet made, are the following:

I. Meteorological Observations :

1. Scientific, after the method now pursued by the Smithsonian Institution, whose observations, so far as they go, may be also used.

2. Practical, after the plan adopted by the United States Signal Service, making it applicable, however, to agricultural as well as marine affairs. This can best be done, probably, by securing the services of the telegraph companies and a more general distribution of charts showing the current weather, like those of the Western Union Telegraph Company.

II. Mechanical Experiments :

1. With strength of materials.

2. With different motive powers.

3. Trials of agricultural implements used for pulverization, seed sowing, cultivation of the growing crop, harvesting, threshing, cutting and cooking of animal food, etc.

4. Trials of mechanical implements used in production and manufacture, such as mining, lumbering, reduction of ores, working in metals, woods and clays.

III. Experiments in physics; particularly the effects of different degrees of light, heat, electricity and moisture on seeds and plants.

IV. Chemical experiments; particularly the analysis of soils, of clays and other earths used in the arts; of coals, lime and build-

ing rocks, minerals, manures, plants and their products, and of animal products.

V. Experiments and observations in mining and metallurgy; especially in the mining of coal.

VI. Experiments with soils in their drainage; pulverization by implements; the application of different fertilizers; the variation of soils in the same field; their continuous cropping without the application of manures, and their irrigation.

VII. Experiments in special culture with different varieties of grasses, grains, roots, plants, trees, etc., with variations in the depth, distance and time of planting; in the cultivation, harvesting, manuring, drainage, irrigation and mode of propagation, etc.; with an examination into the special diseases and insects affecting each.

VIII. Experiments in the breeding and feeding of domestic animals of all kinds, including an economical comparison of different species and of varieties of the same species at different ages, under differing conditions of fatness and food, and examinations into their diseases.

It may seem to some, that in insisting upon so varied a course of experimentation, too much importance has been attached to this and perhaps the whole system of industrial education. But the facts show otherwise, as any one who will read the late speech of Judge Hoar upon National Education, may see. The facts there cited and borne out by the testimony of the Regent of this University, in his observations made in 1869, prove pretty conclusively that the polytechnic schools of the continental nations of Europe between the years 1851 and 1867, have almost entirely reversed the position of those countries as compared with their former condition. In 1851, England was far in advance of all the other nations in her exhibition of manufactures at the Crystal Palace. In 1867 she was far behind many other countries, and her former customers not only supplied themselves, but competed with her in the markets of the world. Her own statesmen trace her comparative inferiority to the lack of industrial education; and to-day, her operatives are by thousands thrown out of employment, and suffering for food. These facts prove, what is sufficiently reasonable, that educated intelligence, and not brute strength, is to win, even among the laborers of the future. Neither Illinois nor any other State *can afford* to neglect industrial education in any of its branches.

In conclusion, I would again call the attention of your Excellency to the resolution of the Board of Trustees (page 80), recommending a reduction of the number of the Board, which, already composed of 32 members, will be increased, at least by the addition of one for each congressional district, making the number 35 or more. The Board ask that the number be reduced to one member from each congressional district, with the present *ex-officio* members, which would make the total number about 20. For many institutions even this number might seem unnecessarily large; but experience has shown that in an *educational experiment* like the Industrial University, we require as wide a range of experience and observation in its legislative department as is practicable. To rightly ascertain the educational wants, tastes and capacities of the great industrial classes, and meet them, requires not only ability and faithfulness, but that kind of wisdom which is found in a multitude of counselors, coming from the ranks of the people in all parts of the State.

Respectfully,

W. C. FLAGG,

Cor. Sec. of Board of Trustees.

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ERRATA.

On page 269, last line before title "Highways," for "eminent," read "ermined."

On page 278, first line of second paragraph, for "stated periods," read "statute provides."

On page 278, in fourth line of second paragraph, for the words, "after the expiration of," supply "within."

INTRODUCTORY.

To His Excellency JOHN M. PALMER, *Governor of Illinois:*

In accordance with my duties as Corresponding Secretary of the Board of Trustees of the Illinois Industrial University, I submit herewith their Third Annual Report, including the Proceedings of the Board of Trustees and of their Executive Committee, and Reports of the Agricultural Lectures and Discussions held at the University, at Centralia and at Rockford, during the past year.

The Treasurer gives a full financial exhibit on pages 85, 86 and 87, covering the year of the report.

During the year covered by this report, as may be seen by reference to the circular and catalogue, 8 professors, 2 non-resident professors, 5 teachers and assistants of professors, and 4 assistants on the farm and in the garden and shop, have been employed; 180 students are enumerated on the catalogue, representing 46 of the 102 counties of Illinois, and 8 other States. Classified according to the studies pursued, 61 are in the Agricultural Course, 49 in the Elective, 43 in the Mechanical, 19 in the Military, and 8 in that of Civil Engineering.

The current academic year—no report of which is included in the following pages—has opened under very hopeful auspices. The number of students is increased to over 200, representing 50 counties of Illinois, and 7 other States; and the single building used for dormitories, recitation rooms and cabinets, is already crowded to overflowing. Students are occupying the basement rooms, in the want of better, at some risk of health. Thirteen teachers are obliged to make the best shift they can, with 8 recitation rooms, so limited in their capacity that some of the larger classes must recite in installments, and professors are compelled

to teach the same lessons twice. The time has already arrived when a large extension of the capacity of the University seems necessary, to furnish proper means of culture to the young men and women of our State who desire the "new education," which it is the duty of the Industrial University to furnish.

A committee appointed by a convention held at Bloomington in March last, to visit the Illinois Industrial University, and report upon its management, state that on the 20th and 21st of September, 1870, they found 194 male students and 14 female students in attendance, and that the classes were composed about as follows, each student pursuing three or more studies :

History : taught by lectures to all the students.	
Agriculture and Horticulture.....	50
Mechanics and Civil Engineering.....	54
Chemistry.....	65
Comparative Anatomy.....	15
Mathematics.....	138
Military Tactics.....	23
Commercial.....	50
English Literature, etc.....	92
German.....	63
French.....	27
Latin.....	20
Greek.....	0

These figures, made by gentlemen outside the University, are given because the statement has been repeatedly made and believed that the Trustees of the University were perverting its funds to uses not intended by the Congressional grant, and were teaching the ordinary collegiate studies in the old way.

Only a visit to the institution is needed to dispel these fallacies. While it is not hoped, nor can reasonable be yet expected that all the proposed and desirable ends have yet been secured, it is apparent to the visitor that the institution is tending in the right direction. The Latin and Greek languages, which occupy a chief place in our ordinary colleges are perhaps studied less than they deserve. German and French, as of greater practical importance, not only as means of communication, but as containing a large mass of scientific and agricultural literature, are largely studied. The important relation which chemistry sustains to agriculture

and the mechanic arts, is recognized in the interest that crowds the somewhat contracted limits of that department, with students. The advanced class in chemistry nearly fills the 24 tables of the working laboratory, and the new class of nearly 50 members overflows the recitation room, and will soon need a place for work. Agriculture and mechanics, besides being made the objects of direct study in the class-room, are being extensively illustrated and taught in the fields and shops. A large experimental orchard, comprising 1,200 varieties of apples, is already planted and growing thriftily; 400 varieties of pears, besides varieties of peaches and other fruits, are propagating for farther planting, and will be ready by the time the sites on which they are to be planted can be properly ameliorated by drainage and tillage. A green-house already been two years in use, and a larger glass structure has just been finished which is expected to receive some liberal donations of valuable exotic plants, especially those known in commerce—such as the Date, Sago and Fan Palms, Pine Apple, etc. A large collection of young forest trees of the more valuable species, for lumber, etc., has been made in the nurseries. These, as they attain sufficient size, are to be transplanted into permanent plantations, to test the values of the different species for this purpose. The experimental grounds are still under process of preparation by thorough tile-draining, which is being done by student labor. Two large and convenient barns have been erected on the experimental and stock farms, with due regard to economy and thoroughness of construction.

In the somewhat crowded space of the shops, the mechanical students are not only performing a limited amount of labor as a means of instruction, but are furnished with remunerative employment, which might be indefinitely extended by an enlargement of the shop, and furnish facilities for other work. At present these students are engaged in the making of patterns for founderies, stuff for picture frames, and the frames themselves, and have lately finished the work of fitting and putting up the steam heating apparatus in the University building, at a total cost of material, freights, etc., of \$1,469 83, being more than \$500 less than the amount appropriated by the Executive Committee for the purpose, and more than \$3,500 less than the amount for which responsible parties were willing to contract to do the work. The zeal and inter-

est shown in this department enforce the importance of giving it the aid which the Board of Trustees asked two years ago, but which the General Assembly did not consider it best to grant. It seems specially desirable that the State or private munificence should furnish the requisite presses, types, etc., for a printing office and bindery, which would furnish farther employment for students, and economise the expenses of the University. R. Hoe & Co., of New York, have presented the Cornell University with a steam cylinder press valued at \$3,250. The example is worthy of imitation; and the fact of an University press at Cornell to-day, whose foreman, compositors, pressmen and engineer, are all matriculated students, and whose work is done well, proves that the idea is practicable.

Thus far, I have spoken of the work of the University, and its wants in the direction of teaching and furnishing the means of self-support to the young men and women who are thronging its lecture and recitation rooms. It may be proper, also, to say somewhat of a work not less important, but hitherto somewhat impracticable. I mean that of *originating knowledge*—especially in agriculture—by observation and experiment, and the ultimate elimination of a science of agriculture from the facts so collected. The charter of the University looks to this, and makes it the duty of the Corresponding Secretary of the Board of Trustees to issue circulars, directions for procuring needful materials for conducting experiments, and eliciting instructive information from persons in various counties, selected for that purpose, and skilled in any branch of Agricultural, Mechanical and Industrial Art; and to do all other acts needful to enable him to prepare an annual report regarding the progress of the University in each department thereof—recording any improvements and experiments made, with their costs and results, and such other matters, including State, industrial, and economical statistics, as may be supposed useful. The desirability of doing all this, is sufficiently manifest. There has been on the part of the State Agricultural Society, and of the State Board of Equalization, urgent and repeated requests made for statistics; and the importance of experimentation, if less urged, is still strongly felt. But if there be no power to *require* statistics, the duty of collecting them can avail little, and must be limited to recording and reprinting what has already appeared elsewhere.

Hence, it has not been deemed desirable to attempt the collection of statistics until increased powers were given for their collection, by placing the collection of State statistics in the hands of the Corresponding Secretary, or of the State Auditor, or of a Commissioner of Statistics, and requiring such statistics, so far as industrial, at least, to be made a part of this report.

In instituting experiments, we have to face some facts which we are assured by those of more experience, render experiment difficult. Those who heard the lecture of Dr. Manly Miles, Professor of Agriculture in the Michigan Agricultural College, given at our last State Fair, on Experimental Agriculture, will remember how, himself an experimenter of many years experience, he warned his listeners of the lack of any value in nearly all the experiments hitherto made, from the want of care in the experimenter. To make experiments of any value requires skill and intelligence, great care in avoiding fallacies, singleness of purpose in any given experiment, and great accuracy of detail. This brings us to the conclusion that the kind of experiments wanted require skilled persons to conduct them, and demand more time and expense than many can or will afford, gratuitously. We are brought, in short, to the conclusion, that we should have Agricultural Experiment Stations, at the University and in different parts of the State where chemical, physiological, agricultural, and other observations and experiments can be carried on with uniformity, continuity and exactness. Each of these stations should comprise a tract of ground and suitable buildings, donated to the State for the purpose; and the State should grant an annual appropriation of \$2,000 or \$3,000 to each, to pay the salary of a suitable superintendent and the wages of laborers. For further information as to the value of these Experiment Stations, I need only to refer to the testimony of such men as Liebig, Pugh and Johnson, who commend them as the best means yet discovered for forwarding agricultural investigation.

In view of difficulties such as these, and of the insufficient means for doing all that it was desirable to do, I have been expected to confine the expenditure for collecting material for my annual report to a limited amount, and have had to depend upon circulars and the Annual Agricultural Lectures and Discussions in different parts of the State for such facts of experience as are

here presented. But it is earnestly to be hoped that, with more completeness of the improvements on the experimental farm, and less continuous and exacting demands of preliminary work, that proper experiments and observations may be commenced at the University, and farther means be spared to be spent in this direction. In saying this, however, I would by no means underrate the importance of the annual gatherings of the farmers of the State begun under the auspices of this University. They have a high value as a means of gathering facts and disseminating knowledge of the best practices in the art of agriculture, and are a great stimulus wherever they go.

Among the observations and experiments desirable to be instituted, and for which no sufficient provision has been yet made, are the following:

I. Meteorological Observations :

1. Scientific, after the method now pursued by the Smithsonian Institution, whose observations, so far as they go, may be also used.

2. Practical, after the plan adopted by the United States Signal Service, making it applicable, however, to agricultural as well as marine affairs. This can best be done, probably, by securing the services of the telegraph companies and a more general distribution of charts showing the current weather, like those of the Western Union Telegraph Company.

II. Mechanical Experiments :

1. With strength of materials.

2. With different motive powers.

3. Trials of agricultural implements used for pulverization, seed sowing, cultivation of the growing crop, harvesting, threshing, cutting and cooking of animal food, etc.

4. Trials of mechanical implements used in production and manufacture, such as mining, lumbering, reduction of ores, working in metals, woods and clays.

III. Experiments in physics; particularly the effects of different degrees of light, heat, electricity and moisture on seeds and plants.

IV. Chemical experiments; particularly the analysis of soils, of clays and other earths used in the arts; of coals, lime and build-

ing rocks, minerals, manures, plants and their products, and of animal products.

V. Experiments and observations in mining and metallurgy; especially in the mining of coal.

VI. Experiments with soils in their drainage; pulverization by implements; the application of different fertilizers; the variation of soils in the same field; their continuous cropping without the application of manures, and their irrigation.

VII. Experiments in special culture with different varieties of grasses, grains, roots, plants, trees, etc., with variations in the depth, distance and time of planting; in the cultivation, harvesting, manuring, drainage, irrigation and mode of propagation, etc.; with an examination into the special diseases and insects affecting each.

VIII. Experiments in the breeding and feeding of domestic animals of all kinds, including an economical comparison of different species and of varieties of the same species at different ages, under differing conditions of fatness and food, and examinations into their diseases.

It may seem to some, that in insisting upon so varied a course of experimentation, too much importance has been attached to this and perhaps the whole system of industrial education. But the facts show otherwise, as any one who will read the late speech of Judge Hoar upon National Education, may see. The facts there cited and borne out by the testimony of the Regent of this University, in his observations made in 1869, prove pretty conclusively that the polytechnic schools of the continental nations of Europe between the years 1851 and 1867, have almost entirely reversed the position of those countries as compared with their former condition. In 1851, England was far in advance of all the other nations in her exhibition of manufactures at the Crystal Palace. In 1867 she was far behind many other countries, and her former customers not only supplied themselves, but competed with her in the markets of the world. Her own statesmen trace her comparative inferiority to the lack of industrial education; and to-day, her operatives are by thousands thrown out of employment, and suffering for food. These facts prove, what is sufficiently reasonable, that educated intelligence, and not brute strength, is to win, even among the laborers of the future. Neither Illinois nor any other State *can afford* to neglect industrial education in any of its branches.

In conclusion, I would again call the attention of your Excellency to the resolution of the Board of Trustees (page 80), recommending a reduction of the number of the Board, which, already composed of 32 members, will be increased, at least by the addition of one for each congressional district, making the number 35 or more. The Board ask that the number be reduced to one member from each congressional district, with the present *ex-officio* members, which would make the total number about 20. For many institutions even this number might seem unnecessarily large; but experience has shown that in an *educational experiment* like the Industrial University, we require as wide a range of experience and observation in its legislative department as is practicable. To rightly ascertain the educational wants, tastes and capacities of the great industrial classes, and meet them, requires not only ability and faithfulness, but that kind of wisdom which is found in a multitude of counselors, coming from the ranks of the people in all parts of the State.

Respectfully,

W. C. FLAGG,

Cor. Sec. of Board of Trustees.

DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE.

In the arrangement of the studies in this Department, the endeavor has been to present so thorough and extended a drill in grammatical and philological study, and in the authors and history of our language, as to afford the advantages, so far as may be, of the ordinary study of the Latin and Greek.

The course is arranged to extend through three years, but it may be shortened according to the ability or needs of the student.

Instruction will be given by text books and lectures; and constant practice in essay writing, forensics, presentation of plans and criticism, will be required. Public declamations, original or selected, and original essays, are required of every student at least twice a term, during his entire connection with the University.

FIRST YEAR.—*First Term.*—Punctuation, Use of Capitals, Sources of the English Language, Principles of Composition and Essay Writing.

Second Term.—Primary Rhetoric, Advanced Grammar, Philological and Grammatical Analysis of Modern Authors.

Third Term.—Advanced Grammar, Philological and Grammatical Analysis of Milton and other authors, History of their times and contemporaries.

SECOND YEAR.—*First Term.*—Grammatical and Philological Analysis of Shakspeare and early dramatists, History of the Times and Contemporaries of Shakspeare.

Second Term.—Grammatical and Philological Analysis of Chaucer, Gouce, Spenser, etc., and history of their times, etc.

Third Term.—History of English Literature, Essays and Criticisms.

THIRD YEAR.—*First Term.*—History of English and American Literature, Essays and Criticisms.

Second Term.—Rhetoric proper, Instruction, Plans, etc.

Third Term.—Elements of Criticism, Methods of Philological Study, etc.

DEPARTMENT OF GERMAN LANGUAGE AND LITERATURE.

This language being of quite practical value to the farmer and artisan in this country, it will be taught thoroughly in a two years' course. The first year aims to enable the student to read such German scientific works as his course demands. The second year completes the course, and makes the student thoroughly acquainted with the language.

FIRST YEAR.—*First Term.*—Worman's Complete German Etymology, to lesson 28. *Second Term.*—Etymology completed; Conversational Reader; German Echo commenced. *Third Term.*—Syntax; Reader completed.

SECOND YEAR.—*First Term.*—Review of Etymology; Classic Reader. *Second Term.*—Review of Syntax; Schiller's Wilhelm Tell; Goethe's Iphigenia. *Third Term.*—Lectures on the German language, conversation and composition; Schiller's Jungfrau von Orleans; Reading of German papers through second and third terms.

Books for reference—Grimm's Deutsche Sprachlehre; Adler's Dictionary.

DEPARTMENT OF THE LATIN LANGUAGE AND LITERATURE.

Students will not be admitted to this Department who are not prepared to enter at once upon the reading of Cicero.

FIRST YEAR.—The orations of Cicero. Latin Prose Composition begun and continued through the course. Selections from Virgil. Latin Prosody.

SECOND YEAR.—Selections from Livy. Horace. Juvenal.

THIRD YEAR.—Cicero de Officiis. Cicero de Oratore. Lectures on the origin and structure of the Latin language. Frieze's Quintilian. Other authors will occasionally be substituted in place of some of the above.

DEPARTMENT OF GREEK LANGUAGE AND LITERATURE.

This course will resemble that in the Department of Latin.

FIRST YEAR.—First three books of Xenophon's Anabasis. Herodotus. Greek Prose begun.

SECOND YEAR.—Demosthenes, Thucydides, Homer's Iliad.

THIRD YEAR.—Xenophon's Memorabilia of Socrates. Selections from Plato and the Greek Poets.

Select portions of Smith's History of Greece will be read in course, and lectures given on the Grecian History, Literature and Philosophy.

DEPARTMENT OF HISTORY AND SOCIAL SCIENCE.

The instruction in this Department will be given partly with text books, but chiefly by lectures, with systematic readings of specified authors, and daily examinations on the same. The study of historical geography will keep even pace with the history studied, and the chronology will be rendered as clear and distinct as possible. Written exercises on chronology, and essays in historical criticism, will constitute prominent features of the course.

FIRST YEAR.—*First Term.*—Discovery, settlement and colonial history of the United States, with notices of other American States. American geography. Two lectures (or lessons) a week. *Second Term.*—History of the United States from the time of the Revolution. Two lectures (or lessons) a week.

SECOND YEAR.—*First Term.*—Ancient History of Greece and Rome, with notices of other ancient nations. Ancient geography. Five lessons (or lectures) a week. *Second Term.*—Mediæval history, with history of Christianity and ancient schools of philosophy. Scholasticism. Modern history—general European history. European geography. Five lessons (or lectures) a week. *Third Term.*—Political economy.

THIRD YEAR.—*First Term.*—Constitutional history of England, and of the United States. Two lectures a week. *Second Term.*—History of civilization. Analysis of historical forces and phenomena. Notices of the history of the arts and inductive sciences. *Third Term.*—Political philosophy. Constitutional and international law.

COMMERCIAL DEPARTMENT.

The course in this Department will occupy one year, the first term of which will be occupied in teaching the principles of book-keeping in general; the second, their application to special lines of business, general business forms and papers, and the third, to the higher operations of a counting house, commercial law and political economy. Students who wish to prepare for a commercial career, and also to acquire a general education, may extend this course through two or more years, by taking such collateral studies as their contemplated vocation may render desirable.

Studies recommended for this purpose, would be: the English and German Languages, Mathematics, one or two terms of Chemistry (for druggists, etc.), and History.

First Term.—Book-keeping by single and double entry. Theory of Mercantile Accounts, and the several principal and auxiliary books. Penmanship. Commercial calculations.

Second Term.—Partnership Accounts, Commission and Shipping. Farm books. Business forms and papers. Notes. Drafts. Exchange. Endorsements. Bills of lading. Account current. Account sales. Inventories, invoices, etc. Commercial correspondence.

Third Term.—Banking and Bank-book Keeping. Railroad Accounts. Political Economy, Twelve Lectures on Commercial Law.

DEPARTMENT OF MILITARY SCIENCE AND TACTICS.

This Department is organized under the provision of the Acts of the National and State Governments, requiring the instruction in Military Tactics.

The Board of Trustees of this University have adopted the rule, that all students take part in military exercise, unless excused for sufficient cause, as aggregation of numbers is a paramount necessity to render such instruction effective.

The instruction in this Department will be given in two sub-divisions, arranged as follows:

1. Practical Instructions in Military Tactics (for the present, confined to the infantry arm), to all able-bodied students of the University, comprising the following branches:

Manual of Arms; Squad and Company Drill; Bayonet Exercise; Skirmish Drill; Battalion Drill; Guard and Picket Duty; Evolutions of the Brigade; Target Practice.

The exercises are confined to three hours' drill and instruction per week.

2. Military Science. There will be taught a class in Military Science and Art, as far as it is necessary for duties as officers of the line. Students will be admitted into this class after having participated at least two terms in the general military exercises, and shown such proficiency and ability as may secure a utilization of the instruction thus received.

The instruction, theoretical and practical, is to occupy not to exceed five hours per week, and is so arranged as not to interfere with any other courses

of study, and makes it possible for the member of any other course to engage in it as an optional study.

The members of this class will officer the companies, and act as drill sergeants and instructors for the lower classes.

As collateral studies for such as make this course a specialty, are recommended Mathematics and Surveying, English and Modern Languages, Drawing, one term of Chemistry, History and Political Economy.

FIRST YEAR.—First Term.—School of the company; bayonet fencing.

Second Term.—Battalion and skirmish drill; bayonet fencing.

Third Term.—Brigade and division evolutions; target practice and theoretical instruction on the rifle and fire arms.

SECOND YEAR.—First Term.—Military administration; reports and returns; army regulations and military laws; sword fencing.

Second Term.—Outpost and picket duty (Mahon's); sword fencing.

Third Term.—Military fortification, field and permanent; military bridges and roads; target practice.

THIRD YEAR.—First Term.—Artillery practice; field artillery; drill at the cannon.

Second Term.—Military engineering; cavalry tactics, theoretical.

Third Term.—Art of war (Jomini); military history and statistics; organization and administration of armies.

There is formed now a battalion of four companies, officered by the students of the military class, and battalion drill and skirmish were practiced last term.

APPARATUS.

The value of an institution of learning will depend largely upon the amount and character of its apparatus of instruction—its means of teaching to the eye. No other teaching is so rapid and effective as this. It has been the policy, from the outset, to provide the University the best and most complete means of illustration, and constant additions are being made to its apparatus in all departments.

CHEMISTRY.—This department is furnished with a working laboratory, in which tables are already provided for a class of 24 students, to work at once, with all the appliances needed for making chemical analyses, including the Bunsen Burner, the Spectroscope and the Hibbs' Assaying Furnace. In addition to the usual reagents and apparatus required for laboratory work, and already supplied, there is to be added this summer nearly \$3,000 worth of new apparatus, including a Sacharometer, a Ruhmkorf's Coil, a Narrenberg's Polarizer, a Thermo Electric Pile, and other valuable pieces for illustrating the relations of light, heat and electricity to chemistry, so that the best facilities will be furnished for acquiring a thorough knowledge of this science. As soon as students shall have become acquainted with the general principles of the science, no pains will be spared to familiarize them with it in its applications to agriculture, and other industrial pursuits, and to awaken in them a love for scientific investigation. They will have access to minerals,

ores, and geological specimens, and be taught how to analyze them. A library of standard works on general and analytical chemistry will soon be purchased; and English, French, and German periodicals will furnish information of the most recent views and discoveries in this department of science.

BOTANY AND HORTICULTURE.—*Papier mache* flowers, fruits, etc., have been procured from the celebrated Dr. Auzoux, of Paris. Among them are flowers of several classes which can be easily dissected, and which are so greatly enlarged as to exhibit to the eye the minute organs almost invisible in natural flowers. Also, fruits and grain magnified to show the organs, structure and parts, the coatings, starch, pulp, germs and various tissues. Nothing has ever exceeded the beauty and fidelity of these artificial fruits and flowers. Besides these, the University possesses extensive herbariums, collections of wood, seeds, grains, etc.; also large nurseries of forest and fruit trees, orchards, gardens, small fruit plantations and ornamental grounds—a propagating house and a large green-house just added. A botanical garden and an extensive aboretum are in preparation. The department has also two large and powerful microscopes.

ZOOLOGY, GEOLOGY, ETC.—Cabinets of insects, birds, reptiles, mammals, shells, skeletons, fossils, minerals, charts and plates are already collected and are rapidly increasing. A large double magic lantern, such as are manufactured for the English government army schools, has been procured from London, with a large number of slides to illustrate geology, natural history, astronomy, history, etc.

AGRICULTURE.—Besides the foregoing, nearly all of which serves to illustrate the sciences related to agriculture, the University farms, gardens, etc., embrace over a thousand acres of fine improved farming lands, on which large model barns are being erected, and for which several breeds of fine stock are to be purchased. To illustrate veterinary science, a veterinary stable is to be erected, and *papier mache* models, from Dr. Auzoux, of the horse's mouth and teeth, show the successive changes of age. A dissected foot and ankle, from the same manufacturer, beautifully illustrates the complicated structure of this part of the horse.

PRACTICAL MECHANICS AND MECHANICAL ENGINEERING.—A mechanical shop, occupying a two-story building, is now established on the grounds of the University. In the upper story is the carpenter's shop. This shop is supplied with a circular saw, jig-saw, morticing machine, and a set of work benches and vises for students, with all the necessary carpenter's and cabinet maker's tools. The lower story is devoted to the machine-shop, which is furnished with a boiler and steam engine of eight-horse power; a machinist's "engine-lathe," and two hand-lathes, fitted up with chucks, drills, etc.; a wood-turning lathe; a pattern-maker's bench, with its complement of tools; a blacksmith shop; molding-sand, crucibles, etc., for making brass and other castings; several iron vises, and sundry other tools valuable in the machine shop. The engine is of special design, being adapted to receive different sets of valve-gears, for the purpose of illustrating to the classes, in a working model, the different varieties of the steam engine. In the mechanical shop,

models and apparatus are constantly being made by the students, with the assistance of the director of the shops, and added to the present set of valuable illustrative apparatus of the class-room.

N. B.—Apparatus, of good quality, can be furnished for high schools and colleges. Orders are solicited.

PHYSICS AND NATURAL PHILOSOPHY.—This collection includes some of the latest and most important improvements in the apparatus of physics and natural philosophy. The air pump is of the best form in use. It was made by the celebrated firm of E. S. Ritchie & Sons, of Boston, and cost \$275. It has a rotary movement, combined with "Ritchie's patent action" of the piston and valves. This final step in the perfection of the air pump furnishes the means for the nearest approach to an absolute vacuum that it is possible to make by mechanical means. The electrical machine is Ritchie's Patent Holtz Machine. This remarkable machine is of recent discovery, and for this reason is found in but few of the cabinets of older institutions of learning. It is distinguished for its wonderful power and great ease of action, rendering it suitable for performing many experiments, which, with the ordinary machine, were extremely difficult. The collection also includes a Grove's Battery of six cups, an induction coil, model telegraphic apparatus, Magdeburg hemispheres, vacuum tubes, receivers, magnets, and other accompanying apparatus.

HUMAN ANATOMY AND PHYSIOLOGY are taught by the aid of a finely-mounted French skeleton, a French manikin, and large models of the eye, the trachea, lungs, etc., and numerous anatomical plates of life-size figures.

GEOGRAPHY AND HISTORY are illustrated by some of the best maps, charts, engravings, plans of cities, etc.

CIVIL ENGINEERING.—The apparatus for surveying and engineering embraces all the field instruments necessary for making Government land surveys, farm surveys, railroad and topographical surveying and leveling, as the Transit Theodolite, a Level from Newton & Co.'s, London, with two leveling-rods—the ordinary and the self-reading; a first-class Vernier compass; best brazed-link steel chains—Gunter's and Engineer's; also the necessary instruments for the new Stadiar surveying, as adopted in the Government surveys.

MILITARY.—150 muskets and accoutrements complete; 12 cavalry swords; 1 bass drum; 1 tenor drum; 3 fifes; 2 bugles; 18 fencing muskets for bayonet practice; swords, gauntlets and masks, for sword practice; automaton regiment, for theoretical instruction; and a large drill hall to be erected this summer. The library also includes quite a selection of books on military science, military history and engineering.

LIBRARY AND READING ROOM.

The library contains over 4,000 volumes; and is especially rich in books relating to agriculture, mechanics, engineering and the arts; and in natural sciences, history, biography and literature.

The large Library Hall is fitted up as a reading room, and richly provided with American, English, French and German papers and periodicals, embrac-

ing the most important and celebrated scientific and art publications, monthlies, quarterlies, etc. The reading room, well warmed and lighted, is open every day and evening, and is constantly resorted to by the Faculty and students.

Besides the University library, there are also libraries belonging to the literary societies.

REQUIREMENTS FOR ADMISSION.

1. Each student is required by law to be at least *fifteen years* of age; but it is believed that few will be found mature enough at this age to enter with the highest profit upon the studies of the University, and it is recommended, as a general rule, that students be at least eighteen years old before entering.

2. The law also prescribes that "no student shall be admitted to instruction in any of the departments of the University, who shall not previously undergo a satisfactory examination in each of the branches ordinarily taught in the common schools of the State." In addition to these, candidates for advanced standing must pass an examination in each of the branches already pursued by the class, or an equivalent therefor. Those desiring ancient languages must pass in the ordinary preparatory studies in such languages.

3. There are certain elementary studies not yet reckoned among the "branches ordinarily taught in common schools," such as Elementary Algebra, Natural Philosophy and English Composition, which it is strongly recommended that students shall pursue before coming to the University. They necessarily precede the University courses. The advance of the classes compels the discontinuance of instruction in these studies, and students should, if practicable, come prepared to pass examination in them.

4. In order to indicate the extent and character of the examinations required, a set of the questions formerly used is appended at the close. The questions are varied, of course, each year.

CHOICE OF STUDIES.

The University is wholly elective in its courses. Entire liberty of choice is allowed each student in selecting the studies he will pursue. Each student is required to have fifteen lessons a week, unless specially excused for cause. Changes from one department to another can only be made at the opening of a term. Students should carefully seek the advice of the Faculty in the choice of a course of studies, or they will be liable to lose much time in attractive but irrelevant branches; and when a course has been determined on, it should be followed with steadiness and perseverance.

TERM EXAMINATIONS.

Frequent and searching examinations will be held, to test the progress in study, and to determine each student's fitness to remain in the classes. The University cannot be held responsible for the lack of thoroughness in the common school studies of its students; but it will insist upon thoroughness in its own proper studies.

A regular examination of all the classes is made at the middle and close of each term. A record is kept of the standing of each student at all the examinations, and from this his final certificate of graduation is made up.

THE UNIVERSITY UNIFORM.

Under the authority of the act of incorporation, the Trustees have prescribed that all the students, after their first term, shall wear the University uniform. The University cap is to be worn from the first. This uniform consists of a suit of cadet gray mixed cloth, of the same color and quality as that worn at West Point, and manufactured by the same establishment.

The coat is a single-breasted frock, buttoned to the chin, with standing collar, and a trimming of black mohair cord on the shoulders, in loops. The vest is also single-breasted, buttoned to the chin, with standing collar. Buttons for coat and vest are manufactured expressly for the University. They are gilt, of medallion style, the design being a sheaf of wheat surrounded with the words, "Illinois Industrial University." The pants have a welt of dark blue in the outside seams. The suit is a very tasteful dress, and is substantial and enduring. An arrangement has been made with responsible parties to furnish the suits to students at reasonable rates. Students can procure them ready made on their arrival here.

The University cap is of dark blue cloth, and ornamented with the initials I. I. U., surrounded by a silver wreath in front.

The arms and equipments used in the drill are furnished by the State.

Students will wear their uniform always on parade; but in their rooms and at recitation, may wear other clothing. An army blouse or fatigue dress can be purchased at low rates by those who want it.

HONORARY SCHOLARSHIPS.

The Legislature prescribed that one honorary scholar shall be admitted from each county in the State. These scholarships, which are designed "for the benefit of the descendants of soldiers and seamen who served in the armies and navies of the United States during the late rebellion," entitled the incumbents to free tuition. The trustees have also authorized the faculty of the University to remit the tuition of worthy young men whose circumstances are such as to require this aid.

Students desiring admission as honorary scholars, will apply to the county school superintendent for examination, and for a certificate of recommendation.

PRIZE SCHOLARSHIPS.

A movement has been started to secure in each county of the State the endowment of a prize scholarship, with a permanent fund of \$1,000 for each. The plan contemplates that the income of this fund shall be annually awarded to the best scholar, from the public schools of the county, who shall present himself as a candidate for the University. The scholarship shall be determined by a competitive examination, to be held in each county, under the

Regent of the University, and the State Superintendent of Public Instruction. The examination will be held the first Friday in September, or at such time and place as the County Superintendent of Schools may appoint. Honorary scholars will be examined at the same time. Only a few of the counties have as yet provided for the prize scholarship, but it is hoped that a prize of greater or less amount will be provided in each county in which a worthy candidate shall be selected.

STUDENTS' DORMITORIES AND BOARD.

There are in the University building about sixty private rooms for students, which are rented to the students who first apply. Each room is designed for the accommodation of two students. These rooms are fourteen feet long and ten feet wide. They are without furniture, it being deemed best that the students shall furnish their own rooms. It is earnestly recommended, for health's sake, that each student have a separate bed. A study table, chairs and a small coal stove, may be provided in common by the occupants of the room.

Good private boarding houses are already springing up around the University, where either day board or board and rooms can be obtained, with the advantages of the family circle. A boarding club is maintained by the students in the University building at a cost of from \$2 to \$2 50 per week. Several students have provided themselves with meals in their rooms, at an expense varying from \$1 to \$1 50 per week.

To avoid unnecessary litter about the grounds, coal is purchased by the University at wholesale, and furnished to students at cost.

HOW TO ENTER THE UNIVERSITY.

In answer to the questions often received, the following explicit directions are given to those wishing to enter the University:

1. You must be over 15 years of age and of good moral habits. If unknown to the faculty, you should bring a certificate of character.

2. You must possess a thorough knowledge of the common school branches, Arithmetic, Grammar, Geography and History of the United States. You should be able to pass an examination in Algebra to quotations of the second degree, and in Natural Philosophy. The further advanced in study, the better you will be prepared to secure the full advantages of a residence at the University. Some of the departments require more preparation than others.

3. You should enter at the beginning of a term; but you can enter at any other time if prepared to go forward with any of the classes.

4. If doubtful of your ability to enter the department you have selected, write to the Regent, J. M. Gregory, Champaign, and state what branches you have studied, the progress you have made in each, and your wishes as to course and term of study.

5. If prepared, come on at once. You will find friends in the faculty to advise, and if necessary, to assist you.

HOW CAN I PAY MY WAY?

In answer to this question, which often reaches us from earnest young men, eager for an education, but without means, we reply:

1. Your necessary expenses (except for books and clothing), will be as stated hereafter, under the head of "Expenses."

2. During the Spring and Fall terms, and to some extent during the Winter term, you can find work on the University farm and gardens, or in the shops, for which you will be paid $12\frac{1}{2}$ cents per hour, if diligent and faithful. You can easily, without hindering your studies, work two or three hours a day, and if needful, the whole day on Saturdays. This will amount to \$3 per week, and will, if you choose to board yourself, more than cover all your expenses. If you understand some common trade, you can do still better. You will easily be able to earn, during the vacation, enough to buy your clothes and books. Several secure labor, at good wages, on the farm or in the mechanic shops during the summer vacation. Some students pay their way, and have money to spare.

You should have, to start with, money enough to pay your entrance fee and bills, and to buy your half of the furniture of your room, which will cost, say \$15. You will find numbers of fellow students who are taking care of themselves, and who will, with true brotherly feeling, advise and assist you. Come on without fear. What man has done, man can do. Remember, if *education* costs much, *ignorance* costs more. Education costs in youth; ignorance costs always.

TERMS.

The college year is divided into three terms, of fourteen, twelve and ten weeks. Students are expected, in all cases, to be present on the first day of the term. Those unavoidably delayed will be required to make up all lessons which their classes shall have passed over in their absence.

CALENDER FOR 1870-71.

Examination for admission.....	Tuesday, Sept. 13, 1870
Fall term opens.....	Wednesday, Sept. 14, 1870
Fall term closes.....	Wednesday, Dec. 21, 1870
Vacation of two weeks.	
Examination for admission.....	Jan. 3, 1871
Winter term opens.....	Jan. 4, 1871
Winter term closes.....	Mar. 27, 1871
Examination for admission.....	Mar. 28, 1871
Spring term opens.....	Mar. 29, 1871
Spring term closes.....	June 7, 1871
Commencement.....	June 7, 1871

EXPENSES.

Tuition in the Agricultural, Mechanical, Engineering, Chemistry and

Military courses are free.

Tuition, in other courses, to students from Illinois, per annum.....	\$15 00
Tuition, in other courses, to students from other States, per annum....	20 00
Fee for incidentals, per term.....	2 50
Room rent for each student, per term.....	4 00

Room rent is only charged to students who room in the University building. Each student is required to pay a matriculation fee of \$10 on first entering the institution. This entitles him to membership till he completes his studies. Honorary and prize scholars pay no tuition fee, but pay all other fees. All bills due the University must be paid, and the Treasurer's receipt be shown to the Regent before the student can enter the classes.

The annual expense of a residence at the University, exclusive of books and clothing, will be nearly as follows :

Tuition, room rent and incidentals, from.....	\$19 00 to \$ 34 50
Board, from.....	54 00 to 180 00
Fuel and lights, from.....	10 00 to 15 00
Washing, 75 cents per dozen.....	10 00 to 15 00
Total.....	\$93 50 to \$244 50

Many young men reduce the expense to within \$90 per year, and pay this by their labor during the year. It ought to be known that *any young man can pay his way through college* who is willing, for the sake of an education, to practice steadily the virtues of industry and economy.

LADIES' DEPARTMENT.

The Trustees have voted to admit female students as soon as suitable accommodations can be provided. Ladies already attend the lecture course, and early preparations will be made to afford them the full benefits of the institution.

GOVERNMENT.

The University is designed for *men*, not *children*, and its government rests in an appeal to the manly feelings and sense of honor of its students. If any student shall show himself so weak or corrupt that he cannot, when thus treated, refrain from vicious conduct, he will receive permission to leave the institution, where his presence can only injure others, without being of any benefit to himself. But no pains will be spared to counsel the inexperienced, to admonish the careless, and save the tempted. Especially will it be an object to establish and maintain that high toned, refined, and honorable sentiment, which is at once the best safeguard against meanness and vice, and a constant inspiration to nobleness and virtue.

SCHEME OF RECITATIONS AND EXERCISES.

	7-8 A. M. *	8½-9½ A. M.	9½-10½ A. M.	10½-11½ A. M.	11½ A.M.-12½ P.M.	1-2 P. M.	2-3 P. M.	3-4 P. M.	4-5 P. M.	
FIRST YEAR.	1st term.	Geometry....	Chemistry....	Latin.....	Agriculture.....	English.....	Book-keeping....	Drawing.....	Drawing.....	Drill Mondays, Wednesdays and Fridays. Lectures Tuesdays and Thursdays.
	2nd term.	English 7:30	Geometry and Algebra, 9..	Chemistry 10....	Botany 11.....	.....	Book-keeping, Latin, Descriptive Geom. and Drawing.....	Descriptive Geometry and Drawing.....	Agriculture..	As above.....
	3rd term.	Algebra.....	English.....	Botany — Second Class.....	Analytical Chemistry.....	Analytical Chemistry.....	Book-keeping....	Botany.....	Agriculture..	As above.....
SECOND YEAR.	1st term.	German Botany.....	Chemistry....	Trigonometry....	Analytical Chemistry, English Literature.....	Analytical Chemistry, Zoology, Latin.....	Surveying, Shop Practice, Drawing.....	Surveying, Shop Practice, Drawing.....	Mil. Science, Agriculture	As above.....
	2nd term.	German 7:30	Physics 9....	Analytical Chem. 10. — Rhetoric, Shades, Shadows and Perspective.....	Shades and Shadows 11, and Perspective Analytical Chemistry.....	.....	Analytical Geometry.....	Agriculture, Latin.....	Mil. Science.	As above.....
	3rd term.	German.....	Physics.....	Calculus.....	Analytical Chemistry, English Literature.....	Analytical Chemistry, Lithology	Latin.....	Agriculture.....	Mil. Science.	As above.....

SCHEME OF RECITATIONS AND EXERCISES.—Continued.

		7-8 A. M. *	8¼-9½ A. M.	9½-10½ A. M.	10½-11½ A. M.	11¼ A.M. 12½ P.M.	1-2 P. M.	2-3 P. M.	3-4 P. M.	4-5 P. M.
THIRD YEAR.	1st term.	English.....	Geology, Calculus.....	French.....	Principles of Mechanics, Roads and R. Roads, Anal. Chem....	Prin. of Mech., Roads, & R. R. Anal. Chem....	Ancient History..	Anal. Chem., Agriculture.....	Anal. Chem., Mil. Science.	As above.....
	2nd term.	Agriculture, 7:30.....	French 9.....	Phys. Geog. and Meteorology, Analyt. Mech., Geology, Eng. Lit.....	Anal. Mech., Mahan's Engineering.....	.....	Medæval History, Modern Hist'y.	Anal. Chem.....	Anal. Chem., Mil. Science.	As above.....
	3rd term.	Elements of Criticism...	French.....	Pol. Economy....	Prac. Chem., Machine, Tools and Practice, Geology of Ill.....	Prac. Chem., Machines, Tools and Practice...	Pol. Economy....	Mechanics and Astronomy....	Mil. Science..	As above.....
FOURTH YEAR.	1st term.	Strength of Materials & Hydraulics.	Mental Philosophy....	Zoology, Applied Mech.....	Preparation of Chemicals.....	Prep. of Chemicals, Prac. Astronomy, Geodesic Surveying.	.....	Constitutional History.....	.....	.....
	2nd term.	.....	Animal Physiology, Moral Philos. 7, 9, & Logic, Drawing....	Rural Economy, Drawing 10, Assaying and Metallurgy....	Stock Feeding, etc., Motors & Mill 11.—Work Assaying and Metallurgy....	.....	Stability of Structures.....	History of Civilization.....	Mining Engineering....	.....
	3rd term.	.....	Entomology.	Rural Law, Mining, Engineering.....	Hist. of Phil., Assaying and Metallurgy....	Assaying and Metallurgy, Stability of Structures	Drawing and Shop Practice.....	Drawing and Shop Practice, Constitutional Law, Geology of Mines.....	.....	.....

QUESTIONS USED IN THE EXAMINATION OF CANDIDATES

FOR ADMISSION TO THE

ILLINOIS INDUSTRIAL UNIVERSITY, IN 1868.

No examination was deemed satisfactory in which the candidate did not answer correctly 70 per cent. of the questions in each study.

ORTHOGRAPHY.

1. What does Orthography include ?
2. How many elementary sounds in the English language ?
3. What letters might be spared from our alphabet as expressing no additional sound ?
4. Write the plurals of lady, and day, and give the rule.
5. When a word receives a suffix which begins with a vowel, what is the rule in regard to doubling the final consonant ?
6. How are derivative words formed ?
7. Give words having the following prefixes and suffixes, and define each word : *ad, con, in, sub, ment, ship.*

READING.

1. What is Emphasis ?
2. How many kinds are there ?
3. What are the different classes of inflection ?
4. Punctuate the following, and mark the emphatic words, the inflections, and the rhetorical pauses :

“There is a tide in the affairs of men which taken at the flood leads on to fortune.”

“Let not your hearts be troubled Ye believe in God believe also in me In my Father's house are many mansions if it were not so I would have told you.”

“New occasions bring new duties
Time makes ancient good uncouth
He must upward still and onward
Who would keep abreast with truth.”

GRAMMAR.

1. Name the different classes of pronouns.
2. Give the rule for forming the possessive case of nouns, and write the possessive case singular of *lady*, *who*, *I*, and the possessive plural of *sheep*, *ox*, *mouse*.
3. What particular pronouns are varied in form to denote gender ?
4. What sentences containing *that*, used as an adjective, a conjunction, and a relative.
5. Give the second person singular of the verb *be* in the several moods and tenses.
6. What are the principal parts of the following verbs: *Lay*, *lie*, *lead*, *make*, *see*, *sit*, *set* ?

Answer each of the questions annexed to the following sentence :

"Of the committee who, in June, 1776, had been appointed to prepare the plan, Samuel Adams alone remained a member; and even he was absent when * * 'articles of confederation and perpetual union' were adopted, to be submitted for approbation to the several States."—*Bancroft's U. S. History*, Vol. IX, page 436.

7. Of how many *propositions*, (or *principal clauses*,) does the above sentence consist, and with what word does each proposition end ?
8. Give the leading *subject* and *predicate* of each proposition.
9. Parse *who*, 1776, *member*, and *men*.
10. Also parse *had been appointed*, and *remained*.
11. Mention all the connectives, and the words, phrases, etc., which they severally unite.
12. Correct the following sentences:

"Both this dress and the other is becoming, but neither of them set well."
 "You are not him who I expected to see."
 "Either of the three will answer."
 "The principle city of a State is not always its capitol."

ARITHMETIC.

1. If the divisor is 19, the quotient 37, and the remainder 11, what is the dividend ?
2. What is the quotient of 65 bu. 1 pk. 3 qt., divided by 12 ?
3. In exchanging gold dust for cotton, by what weight would each be weighed ?
4. Give the process for division of fractions by fractions, and the reasons for that process.
5. Divide two and three one-thousandths, by four one-hundredths; and give the reasons for the pointing of the answer.
6. Define ratio and proportion; and distinguish between them.
7. Find the unknown terms in the following proposition:

12 yds. 3 qrs. : 46 yds. 3 qrs. :: (): 6 T. 1 cwt.

8. Required the proceeds of a ninety-days' note for \$100.00 discounted at a bank at 10 per cent.
9. Sold 9 1-6 cwt. of sugar at $\$8\frac{1}{4}$ per cwt. and thereby lost 12 per cent. how much was the whole cost?
10. When it is 7 P. M. at Springfield, Ill., in 89 deg. 33 min. W., what is the time at Cambridge, England?
11. What is the square root of .0043046721?
12. Required the cube root of 212176173.

GEOGRAPHY.

1. Define Mathematical, Political and Physical Geography.
2. What motions has the earth, and to what phenomena does each motion give rise?
3. What is the order of the continents in extent of surface?
4. Describe the mountain systems of North and South America.
5. Name in their order the principal rivers of the Atlantic slope of the United States.
6. Name the countries of Europe, and their capitals.
7. Give the boundaries, and four largest towns of Illinois.
8. Describe the route of travel from Chicago to St. Petersburg, in Russia, and name the bodies of water, the rivers, countries, etc., which you would pass on your way.
9. Through what waters will a vessel pass, and in what directions sail, in going from Glasgow to Adrianople?
10. Name the peninsulas of Europe and Asia.

ALGEBRA.

1. How does the Algebra differ from Arithmetic?
2. Distinguish between a *coefficient* and an *exponent*, and define a *binomial*, a *radical quantity* and a *surd*.
3. What is an equation of the second degree?
4. Divide $x^4 - y^4$ by $x - y$.
5. Solve the equation, $(x + 1)^2 = 2x + 17$.
6. Find the sum of $\sqrt{50}$ and $\sqrt{72}$: of $\sqrt{\frac{2}{3}}$ and $\sqrt{\frac{3}{32}}$.

$$\sqrt{a+x} + \sqrt{a-x} \quad \sqrt{x}$$
7. $\frac{\sqrt{a+x} + \sqrt{a-x}}{\sqrt{x}} = \frac{1}{b}$ Find value of x .
8. State what books, and how far you have studied in algebra.

GEOMETRY.

1. Define a line; a plane; an angle; and a triangle.
2. Demonstrate the theorem—The sum of the angles of a triangle is equal to two right angles.

3. Demonstrate the theorem—The area of a circle is equal to the circumference into one half the radius.
4. State what books you have used, and how far you have studied Geometry.

NATURAL PHILOSOPHY.

1. Define Natural Philosophy.
2. Name the essential properties of matter.
3. What is specific gravity, and how found?
4. Define Pneumatics and Hydraulics.
5. Name and describe the mechanical powers.
6. Describe the Leyden Jar, and explain its theory.
7. State the extent of your study in Natural Philosophy.

LANGUAGES, ETC.

1. State the extent of your studies in Latin and other languages, ancient or modern, the books read and the time spent.
2. Also state the same in any other branches: as Chemistry, Botany, Physiology, Book-keeping, etc.

BY - L A W S .

GENERAL RULES.

1. Every student entering the University will be regarded as pledging himself to obey its officers, laws and regulations.

2. Each student, as a member of the University, is expected to show a proper interest in its prosperity, and is bound, in honor, to promote, in all suitable ways, its interests and success.

3. Every student will be expected to treat his instructors and fellow students with courtesy and due respect, and, by a faithful discharge of his own duties and by all gentlemanly and correct conduct, to contribute to the general well being.

4. Prompt and regular attendance at all general exercises and at all the exercises of his class, is a cardinal duty, which every student owes to the University and to his teachers and class mates.

5. Unusual and all unnecessary noise in the halls and other public rooms will be counted as a breach of proper decorum, and as a violation of the rights of the University.

6. Each student is expected to have a careful regard to the general neatness and good order of the buildings, and to avoid all markings or carvings on walls, floors or other parts of the buildings, or upon the furniture or fences of the University.

7. All property of the University is to be carefully preserved from injury, and every student carelessly or willfully injuring the same is expected to pay for the replacement or repairs.

8. All use of alcoholic drinks, and all visiting of drinking shops or saloons, and of billiard and gambling houses, are strictly forbidden as disgraceful, and destructive to the best interests of the student and of the University.

9. Students desiring to be absent from any University or class exercise shall secure permission beforehand for such absence, and when circumstances prevent application for such permission, they shall offer excuse for their absence, immediately on their return, to the University or to the class from which they have been absent.

10. Six absences during any one term from any University or class exercise which the student is required to attend, without a good and sufficient excuse for such absences, shall suspend the delinquent from all privileges of the University, till restored by the Faculty.

ADMISSION AND DISMISSION.

1. No student will be admitted but on the examinations required by law, and such additional examinations as may be required by candidates for advanced standing, or for any higher course of study.

2. Every student shall, when required, present testimonials of good moral character, or, if from another College or University, certificates of honorable dismission.

3. Students desiring to be absent from the University for one or more terms, or for any part of a term, must apply to the Regent for leave of absence, to be granted by the Faculty.

4. Students in good standing, and who have paid all their University dues, may at any time request and receive an honorable dismission.

Students who have attended the University for one year or more, shall, on leaving, be entitled to certificates stating the studies in which they have sustained their standing. And students who shall have completed satisfactorily the studies of any of the courses of the University shall be entitled to the full graduation certificate of that course, such certificates being granted in accordance with section 10 of the law for the organization of the University.

STUDENTS' ROOMS IN UNIVERSITY BUILDING.

1. The regular time for selection of rooms for the year shall be at the close of the Spring term. Students expecting to room in the building will draw lots for choice, in the order of seniority of classes: *Provided*, that any student who has, with the consent of the Professor in charge, fitted up his room with more than ordinary furniture or fixtures, may retain it if he chooses to decline drawing for a new choice. Students entering at other times may select any room which may be vacant.

2. In choice of rooms two room mates shall have preference over single students.

3. Any student occupying a room singly may be required to receive a room mate, unless he shall prefer to pay double room rent: *Provided*, there are vacant rooms for the applicants.

4. Occupants will be chargeable with any damage done to the room beyond the ordinary wear.

5. Students on renting a room will each deposit with the book-keeper \$2, to be refunded at close of occupancy if the room is left in good condition: *Provided*, that the whole or part of the sum may be used to pay for repairs and cleansing.

6. All putting on of locks, or other alterations or repairs of room, involving any cutting or disfigurement, shall be done by the University carpenter, or under his direction, and no student shall be entitled to remove a lock, even though furnished by himself.

7. At the close of his occupancy, or whenever the student is leaving the University for a vacation or other protracted absence, he shall deposit the keys with the Professor in charge.

8. No more than two students shall occupy any room, except by permission of the Regent or Professor in charge, given in case of the larger rooms.

9. No room shall be used for any other purpose than as an ordinary dormitory and study room, except by special permission of the Faculty.

10. The occupants of any room shall keep the same at all times in neat and orderly condition, and shall not keep on hand any powder or other explosive material, nor shall any pail or bucket of hot ashes be at any time left standing in the room or halls.