

THE  
Present Condition and Outlook  
AT THE  
Virginia Polytechnic Institute  
AND THE  
Necessity for the Appropriation  
ASKED FOR  
Buildings and Equipment  
AND FOR AN  
Increase of Annuity  
INCLUDING  
A Statement of Moneys Expended

Memorial Submitted for the Board of Visitors.

1906

Virginia Polytechnic Institute, Blacksburg.

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# The Virginia Polytechnic Institute.

## Its Present Condition and Outlook.

Memorial Submitted by the Rector of the Board of Directors.

Under the leadership of the Rector of the Board, the late Captain Charles E. Vawter, of the Miller School,—that splendid friend and champion of all education, from the lowest to the highest—the College was thoroughly reorganized by action of the Board of Visitors, in July, 1891.

Date of Reorganization.

Dr. McBryde was then elected president, and stated in an article published in the *Southern Planter*, October, 1893, that the object sought in that reorganization was "to make the College a real school of applied science—an institution of technology that will, in due time, be an honor to the State."

Object of Reorganization.

How nearly that object has been attained the reputation now enjoyed by the Virginia Polytechnic Institute, and the character and success of its graduates will attest.

To reach an intelligent decision as to the real necessity for granting the request of the Board of Visitors for the large sum asked, of the General Assembly, at this session, after the very handsome amount that was appropriated last session, to the uses of this institution, and expended within the past two years, it will be necessary to carefully consider more than one phase of the question.

It is the object of this paper to show the rapid development of this institution, and to explain the steps in that development; to show as fully as possible the amounts appropriated by the State, and the uses to which such moneys have been devoted in the accomplishment of the results that have been attained; to present the real conditions that exist, and to show how urgently the appropriation asked by the Board of Visitors are needed, in order to round out the state of comparative completeness essential to good work in all

Object of this Paper.

the departments of instruction, and to insure the ability of this institution to hold the high position it has taken among the technical schools of the country.

Commencing with the first session after the reorganization of the institution the attendance of students has been as follows:

1891-2, 116; 1892-3, 177; 1893-4, 236; 1894-5, 325; 1895-6, 310; 1896-7, 336; 1897-8, 336; 1898-9, 303; 1899-00, 343; 1900-1, 386; 1901-2, 472; 1902-3, 627; 1903-4, 700; 1904-5, 728; 1905-6, 614.

This steady growth in attendance speaks for itself.

In noting the decrease in attendance in 1905-6 an explanation should be given.

This is not difficult, as at least four causes have operated to reduce the numbers this session.

1. At least 40 juniors of last year either failed or were not allowed to return.

2. The entrance examinations were made more rigid.

3. Strict compliance was exacted to the rule requiring each student to pass on a majority of his studies, or else not have the privilege of continuing to be advanced with the class. This necessarily carries reduction in military standing.

4. Fees were increased from \$37.25 to \$52.25 on all students, an increased tuition added for non-residents.

During the same period the following appropriations have been made by the State for buildings, support and maintenance, in addition to the amount realized by the college from endowments from the United States.

Year	Authorized Bond Issue Interest acct	Special Approp- riation for Building	Annuity for Insurance repairs Maintenance etc.
1892		3,750	2,500
1893		12,000	2,500
1894		12,000	2,500
1895			15,000
1896			15,000
1897	750		15,000
1898	750		15,000
1899	6,750		15,000
1900	6,750		15,000
1901	6,750		15,000
1902	6,750	25,000	25,000
1903	6,750		40,000
1904	6,750	82,500	40,000
1905	6,750	82,500	40,000
	42,750	217,750	257,500
Water works Bonds		1896	...
V. P. I. Improvement Bond		1900	...
			15,000
			100,000

Since 1897 an item of the annual appropriation has been \$750, for interest on "Water Works Bonds," and since 1900, another item has been \$6,000 for interest on the V. P. I. Improvement Bonds."

## HISTORY SINCE REORGANIZATION.

In the summer of 1891 the unsatisfactory condition of the College compelled a reorganization, at once radical and revolutionary. Everything was changed from the foundation up.

Careful study forced the conviction that the field of technical instruction was practically unoccupied.

Field for  
Technical  
Instruction  
unoccupied

It was also realized that the intent of the United States acts of endowment and of the State act of acceptance, demanded this kind of work of the institution, and that it was a line more and more called for by the scientific and industrial activity of our day.

Intent of  
U. S. Acts  
of  
Endowment

It was determined, therefore, to make the institution strictly a school of technology, and to hold it closely to this field of effort.

To be  
School of  
Technology

At the outset there was little in the way of suitable building and equipment. The only modern building was a dormitory with 68 available rooms, accommodating 136 students. Two academic buildings, dating to 1875-6, poorly arranged, and equipped with benches of the roughest description, and a few indifferent laboratory desks, supplied two halls for the literary societies, a room for a library, another for an armory, a drafting room, laboratory, four small offices and eight lecture-rooms, four of them barely large enough to seat fifty students. The mess, farmed out from year to year, to any one willing to run it at his own risk, at a certain stipulated price for board, was established in the basement of one of these buildings, its rooms barely seven feet in pitch; and the smoke and odor from the kitchen making the offices and lecture-rooms above decidedly uncomfortable.

Scanty  
facilities in  
suitable  
buildings  
and  
equipment

The old original building of the Olin and Preston Institute, a most unsightly wooden building, fitted up with a few tools and machines as a shop, and a large frame building, without ceiling or floors; formerly used for commencement purposes, were also available.

There was no audience hall, no system of lighting. Water for the 25 horse-power engine used in the shop was hauled from a stream in barrels, and for the laboratory was pumped by hand from a cistern into a ten-gallon tank in the room.

The farm was without improved stock and machinery, and had for stables indifferent wooden buildings dating from before the Civil War.

Income solely from U. S. endowments

Only State appropriation was for ins. and repairs

There were no laboratories, museums, or offices for the important departments of biology, physics, agriculture, veterinary science, civil, electrical and mechanical engineering.

The income came solely from the United States, the State not giving a dollar in the way of annual appropriations for running expenses, and this, notwithstanding the fact that the terms of the Federal act of endowment which the State had accepted, required not only that it should maintain the buildings and permanent fixtures, but also provide them in future.

The only appropriation was \$2,500 for insurance and repairs. Such was the start and such was the outlook in 1891.

First step to equip shops to enable them to equip other departments.

The first step was to equip the shops and make them equip the other departments, thus securing economy of outlay, and employment for students of limited means.

The old college building was reduced from three stories to two, remodelled and fitted up for the woodworking and machine shops. An electric light plant was installed, and water brought to the shops by gravity, from a spring just beyond the limits of Blacksburg. The College has secured a title to this spring and several acres of land around it. New seats for the lecture-room, desks and cases for the laboratories were made during the summer.

No effort was made to increase the attendance of students, reliance being placed wholly upon the work of the School—after all, the only sure and effective way of advertising it to the public.

For the first session the number only reached 116, not more than 75 of whom were in actual attendance at any given time.

Appropriation for Foundry 1891-2

Strict economy in construction determined upon

During the winter of 1891-2, a special appropriation of \$3,750 was secured from the General Assembly for a forge and foundry building. This building was planned and its erection superintended by our professors of engineering; for at the very outset, we determined to consult the strictest economy, and as far as possible, to carry on the work of construction with our own force. From that day to this not more than \$300 have been spent for architects' fees, and in the cases in which their services were called in for detailed plans, ground plans of the two buildings were furnished them.

Work planned and superintended by departments of engineering.

Our own professors, throughout vacation, as well as during the term, have prepared the plans for the many new buildings erected, and superintended their construction, installed central heating and power plants, our water works plant, our sewerage extension, and the plumbing, heating and light-

ing of the buildings. And these lines of work have, under their direction, been executed largely by our own boys, all this at no extra cost to the College, until construction became so heavy it was thought proper to allow a little compensation to these professors in the engineering department, who have given practically their whole spare time during fall and spring months of session, and largely of their time during vacation, to the work of supervision.

The second session the number of students rose to 177, and the third to 236, and serious overcrowding began to be felt in several departments.

The temporary mess in the old shop, where it was first established proved too small, and the semi-ruined pavilion was recoiled, floored and divided up into rooms, and the mess transferred to it. Application was made to the General Assembly, 1893-4, and \$12,000 a year for two years secured for the erection of another dormitory and a combined mess and commencement hall. A dormitory of 55 rooms, accommodating 110 students, and a building with a dining-room on the first floor, with seats for 450, and an audience room on the second floor with seats for 800, and with necessary offices in an ell, were built, lighted and heated with the appropriation.

This provision for better accommodation carried the number of students up to 325 the very next session, an increase of 89, as compared with the preceding one, and overcrowding again resulted. Unwilling to apply so soon for more aid efforts were made to keep numbers down. The sub-collegiate department was abolished, but without appreciable results, for the attendance fell only to 310, rising again to 336, where it stood two years. The age limit was then raised from fifteen to sixteen years, but with no marked effect upon the attendance.

Our water supply proving insufficient, we were forced to ask permission to borrow \$15,000 for a better supply. This was during the session 1895-6, and we were enabled to purchase a spring with daily flow of 200,000 gallons, surrounded by a plot of 13 acres, to erect a tower with 50,000-gallon tank, and to install the necessary pumping machinery.

A six-inch main running from the tank near all the important buildings, gives good protection in case of fire.

After careful study of the situation, the Board finally felt it its duty to again apply to the General Assembly for aid. A test of the buildings and equipment required to meet the pressing needs of the institution, and to provide for its continued growth, was prepared and submitted to the General Assembly, 1899-1900, and authority asked to borrow \$200,000.

Crowded conditions begin.

Temporary mess arrangements.

Dormitory No. 2 and mess hall erected.

Crowded condition continues.

Efforts to hold attendance down.

Water supply provided.

Pressing needs presented and authority to borrow \$100,000 granted.

At the time it was declared before the Finance Committee of the House and Senate as the conviction of our authorities that such provision would carry our number to 500 in five years' time.

Authority was obtained to borrow \$100,000, but even this inadequate provision carried the attendance to 627, in less than five years.

**Science Hall.** With the money borrowed we were enabled to erect and partially equip a large science hall, three stories in height, besides basement and attic, for the departments of General Chemistry, Agricultural and Analytical Chemistry, Mineralogy and Geology, Physics and Biology, a dormitory of sixty rooms, furnished for 120 students, with bath-rooms and water closets in the basement; a large wing to the shops; a house for the President, and to remodel his old residence, ideally situated for the purpose by reason of its central location and proximity to the dining hall, into an infirmary of best modern type. Three carefully planned barns were built for the farm.

**Dormitory No. 3.**

**Wing for shop, House for President.**

**Modern Infirmary**

**Central Heating and Power Plant.** The most important addition, however, was a new, centrally located heating and power plant, containing a large coal bin, a boiler room with two 100 horse-power Heine safety boilers, and an engine-room with a 75 horse-power engine, and large generator. The dormitories and other neighboring buildings, formerly heated separately by furnace or basement heaters, are now more economically heated by use of exhaust steam, heretofore wasted. The motors and shops and pump at the distant spring are run by the generator.

**Machinery and apparatus.** Important additions to equipment in the shape of new machinery for shops and apparatus for scientific department were also provided.

**Increased attendance** Influenced, probably, by reports of improvements in progress at the College, the attendance rapidly rose during the next three years to 343, 386 and 472, respectively, with resulting congestion, especially in the dormitories.

**Dormitory No. 4.** Appeal was successfully made to the General Assembly, 1901-2, and with the \$25,000 obtained, another dormitory was built, furnished and equipped with heat and light. Important improvements were also effected in dining-hall and in other departments.

**Increase in annuity.** This year an increase from \$15,000 to \$25,000 was allowed in annuity.

To the extra session, 1902-3, application was made for \$125,000 for buildings and equipment, and for an increase in annuity.



At the suggestion of the chairman of the Finance Committee of the Senate, in view of the great uncertainty as to the revenues of the State, under the new Constitution, then just going into effect, the Board withdrew the request for the appropriation for buildings, but the increase in annuity to \$40,000 was granted.

In direct special appropriations since 1891, the State has given us \$217,750, and it has allowed us to borrow \$115,000, the State paying the interest. Starting with a small annual amount for insurance and repairs, the annuity was increased to \$15,000, and permitted to cover not only buildings, maintenance and improvements, but other running expenses. The annuity has been still further increased, first to \$25,000, and then to \$40,000. For these specific appropriations and part of the annual grants used for buildings we have to show 4 dormitories, four stories high, besides rooms in basement for closets, etc., with necessary fixtures.

Buildings  
erected  
since 1891.

Science Hall—a large building with 38 rooms, for laboratories, lecture-rooms, museums, office, etc.

Of Brick

Science Hall—destroyed by fire in 1904, rebuilt with slow-burning construction.

Residence for President and for nine professors.

A large heating and power plant.

A forge and foundry building.

Old college building converted into shops, and subsequently remodelled and large additions made.

Old president's house remodelled and large wings added for infirmary.

A large mess and commencement building, capacity doubled and very large extension added.

A large laundry and tailors' shop.

These twenty-two buildings are of brick.

The large wooden buildings are five barns, veterinary infirmary, creamery and cold storage, cannery and jelly factory, three professors' houses, and one cottage, three residences for college officers, four cottages for foremen, and three for laborers—twenty-one in all.

Wooden.

A suitable administration building and a very handsome auditorium of stone have been built, and the large Agricultural Building of stone is well under way.

Stone.

This makes forty-six important buildings erected since 1891, besides a number of smaller ones, not enumerated.

46 important  
new  
Buildings.

In addition a splendid new Y. M. C. A. building of stone has been secured.

Y. M. C. A.  
Building.

Four buildings have been completely remodelled and practically rebuilt, and the four other buildings that antedate 1891,, have been repaired and greatly improved.

Buildings  
remodeled  
and re-  
built.

These buildings have all been furnished and supplied with new seats, desks, cases, tables, shelving, etc., nearly all made in our shops, and are equipped with valuable scientific apparatus.

Analysis of expenditure of amount appropriated by General Assembly 1903-4 with estimates given Finance Committee by Board.

ESTIMATES.		EXPENDITURES.	
Shops and Equipment	\$15,000	Addition to Shops	7,742.87
Dormitory and Furniture	20,000	Equipment for Shops	6,613.57
Heat and Power	15,000	Dormitory with wall	19,166.54
Administration Bldg.	5,000	Furniture for same	947.42
Fire Protection	5,000	H. & P. Ad'n & equip'm't	
Professors' Houses	10,000	Admr. B dg., with vault	
		Fire equipment	
		Houses, Cottages, etc.	
		College fund replaced	3,651.65
		Traveling expenses	436.89
		Incidentals	480.56
		Forge Extension	484.91
		General equipment	9,426.21
Dining Hall		Addition to D'g Hall	10,737.95
Equipment and Commencement Hall.	25,000	Equipment for "	2,565.19
		Commencement Hall	13,303.14
		On Agricultural Hall	23,814.62
		Equipm-nt, Agl Dept.	20,948.17
Agricultural Bldg and equipment		Experiment Barn	2,615.29
		Cattle Barn, Agl. Dept.	2,463.23
		Green Houses	1,679.20
		Silos	4,476.42
	35,000	Excavation for Eng. Bldg.	502.13
Engineering Hall and Equipment	35,000	Science Hall less Ins.	676.60
		Science Hall, equipment	10,382.26
			6,347.40
	\$165,000		17,406.26
			\$165,153.36

For the first six items enumerated—shops and equipment, dormitory and furniture, heat and power, administration building, fire protection and professors' houses—the estimates submitted by the Board amounted to \$70,000, and the expenditure for each runs about with, or under, the respective estimate, the whole amounting to \$63,682.58.

For dining-hall and equipment, and for commencement hall, the estimate was \$25,000, which, added to amount estimated for above items (\$70,000), amounts to \$95,000.

The dining-hall now has seating capacity in the two halls on the lower and upper floor for 900 students, and in the rear extension a much needed dining-hall is provided for graduate students, college officers and professors who may wish to board there. In the attic are a number of rooms which accommodate graduate students.

The extension also furnishes needed quarters for the baker and his assistant, with ample kitchen and storeroom arrangements, and in the equipment labor-saving machinery, necessary for the proper conduct of the establishment has been installed. The expenditure on dining-hall was \$13,303.14.

The auditorium is a very handsome building, of stone, with seating capacity for about 1,500, and provides also a

commodious faculty room and rooms for the Board of Visitors.

In many places such a building would be considered very cheap at \$35,000 to \$40,000, while the cost was only \$23,814.06.

The cost of dining-hall, (\$13,303.14), and auditorium, (\$23,814.62), added to the cost of the first six items listed above, (\$63,682.58), total \$100,800.34 against the estimates of \$95,000—an increase of only \$5,800.34.

The increase in cost of dining-hall and auditorium is due to increased size of extension to dining-hall, and to difficulties encountered in sinking the foundation and to the use of stone for brick in auditorium.

Again, it should be stated that the estimates originally made contemplated brick buildings throughout. The appropriation was not secured till some time in March, and brick making could not be got under way till May. With the great mass of building to be done it would have been impossible to hope to complete in reasonable time, while stone masons were to be gotten, and much of the work could be carried on in weather which other work could not be done. Stone of valuable quality was found on the College property, and the difference in cost was figured as not excessive, while no one will contend that the finished buildings are not far superior.

The current expenses of the College running behind it was thought proper that the sum of \$3,651.65, that had been previously advanced by the College on account of new buildings, should be replaced out of the special fund.

The items for traveling expenses and incidentals are small, as is the item for forge extension.

For pressing needs of the several scientific departments and for other items of general equipment and improvement the sum of \$9,426.61 was expended.

These items—College fund replaced, traveling expenses incidentals, and general equipment—amount to \$14,480.22.

The above items of expenditure foot up \$115,280.56, and an examination will show that each of them is an emergency item, that all are interdependent, and that nearly every one is general in its character, and not for the special benefit of any department or departments, but for the equal benefit of all. Of such character are the items for dormitory, heat and power, administration building, fire protection, dining-hall and auditorium and in a lesser way shops and equipment.

The items enumerated above, that total \$14,480.22 are largely general in character, and the \$8,426.01 was ex-

General and  
emergency  
Items.

House for  
Dean of  
College of  
Agriculture  
and etc.

pended for houses for the director of the station and dean of the College of Agriculture, and for others engaged in the work of that department.

**Importance of Agriculture Building stressed**  
 In presenting the application for the appropriation granted last session the importance of developing the College of Agriculture was emphasized and stress laid upon the need of proper equipment for the several departments and the absolute necessity of providing a suitable building for the conduct of their work.

The agricultural building will be a handsome structure of stone, 170 by 70 feet, and four stories in height.

It is nearly, or quite, half done. The walls are up to the third story, and all frames, one half flooring and one-half of framing timbers, all brick for inside walls and paint for the building are on hand, and bills paid. The cost of this material is between \$4,000 and \$5,000.

The expenditure on the building is \$20,948.17, and on the attached green-houses necessary for the Horticultural Department, is \$4,476.52, and on equipment for the Agricultural Department it is \$2,615.29.

**Items of Expenditure for Department of Agriculture.**  
 The cattle barn, costing \$1,659.20, is a plain building specially designed for experiments in economical feeding of beef cattle, under conditions within the reach of Virginia stock men, and attached silos are a necessary addition.

The range of experiments in this department, planned and already under operation, are destined to be of material value to the stock men of the State.

The experiment barn, built at a cost of \$2,465.23, is a prime necessity, if the results of the lines of experiments, planned and being conducted, by the Department of Agriculture are to be of value. In this department hundreds of experiments in testing varieties of grain, in seed selection, and in results to be obtained from rotation of crops and the proper spacing in planting are being conducted. All of which must necessarily be of no value without a proper building in which to handle the crops from the different plats and determine and record the results.

It is proper to explain here that under existing conditions it had been the custom to anticipate in part the payment made by the United States government for the support of the Experiment Station, as the fiscal years did not coincide. The practice being to obtain an advance from bank to be paid out of the next instalment of income received.

When this came to its notice, the department at Washington directed that this should be discontinued and a readjustment had, and that the amount borrowed should be carried till met by the State. When, however, it was shown that

the State was building a barn solely for experimental purposes to extend and develop the work of the station the point was waived. So, practically, there is a gain to the State instead of an outlay in the construction of this building.

With the exception of the amount expended on the main agricultural building and attached green-houses, it will be readily seen that the outlay for the several departments of agriculture was necessary if any development was to be had in those departments, or even if the results of work actually under way were to be preserved.

With the burning of Science Hall came the necessity for making arrangements to immediately replace it, to meet requirements of the present school year.

It having been always determined by the Board that the building of the Engineering Hall must follow the completion of the Agricultural Hall, it was now recognized that the erection of the former must, of necessity, be abandoned as far as any existing appropriations were concerned.

The expenditure for foundation for the Engineering building was made as the dirt was wanted by the town, and the authorities agreed to remove it without cost to the College. This entailed a real saving of \$1,000 to \$1,200.

It is proper to notice here that the actual expenditure for the direct benefit of the College of Agriculture, including the item "Professors' Houses," was \$41,515.79, and that but for the destruction by fire of Science Hall the \$16,729.66 used to replace that building would have been available and used on the Agricultural Building.

Some persons may criticise the amount of insurance carried on Science Hall—\$15,000—when the first cost of the building was about \$25,000, and the value of the equipment ran into thousands.

When insured the amount was practically three-fourths cost. The contractor afterwards brought in a bill for extras, that was finally allowed, and this reduced the proportion a little.

It is a matter of fact, however, that the College had to threaten suit against the company carrying \$5,000 of the risk before settlement could be had.

While the value of the equipment was considerable, and while it will take a great deal to replace it, much of it was old and antiquated, and needed replacing any way.

The insuperable difficulty, however, to full insurance of all buildings and equipment is the lack of funds. The item for insurance and repairs has already risen to \$7,000, and it constitutes a considerable part of the deficit shown in our current expense. To fully insure all the building and equip-

Precedence  
of Agriculture  
Building.

Total  
expenditure  
for College  
of Agriculture.

ment that has gradually been accumulated would necessitate a much larger outlay.

This matter has been brought to the notice of the Legislature before, and has been met, in some instances, at least, with an expression of opinion that the State should carry its own insurance, at least, in part.

As a matter of fact the salvage in foundation, walls, etc., was considerable—quite \$5,000.

**Appropriations asked with Estimates.**

	\$60,000.00
Agriculture Hall; to finish, heat and equip	10,000.00
Equipment ordered for Science Hall not yet paid	30,000.00
Engineering Hall; to build and furnish	7,500.00
Heat and Power; addition and equipment	2,500.00
Forge; extension and equipment	4,000.00
Shops; improvements and equipment	7,500.00
Equipment for Departments of Chemistry	500 00
"    "    Department    "    Biology	4,000.00
"    "    "    "    Geology	4,000.00
"    "    "    "    Physics	7,500.00
"    "    "    "    Mechanical Engineering	5,000.00
"    "    "    "    Electrical	2,500.00
"    "    "    "    Civil	5,000.00
General equipment; departments not especially enumerated	\$150,000.00
Special appropriation to cover deficit in current expense	20,000.00
Increase asked in annual appropriation \$15,000.00	30,000.00
<b>Total for two years; increased annuity and special appropriation</b>	<b>\$200,000.00</b>

Science hall equipment.

Agricultural Hall.

The first item is for new equipment ordered for Science Hall, which was burned last spring.

The Agricultural Hall is about half done, and to finish, heat and equip we estimate that at least \$60,000 will be required.

It is very necessary to the work of the College of Agriculture that this building should be completed as soon as possible.

The frames, half the flooring, etc., is delivered and paid for, and there is brick for inside work on hand, and there need be no delay as soon as weather is suitable.

The building is of stone, and considerably larger than was at first contemplated. In preparing the foundations it was necessary to do a great deal of excavating, as the bed-rock was in very irregular depths. This, with use of stone instead of brick, has added materially to cost of the building.

The present estimate includes about \$10,000 for heat and contemplates an equipment costing not less than \$20,000. To equip such a building at all suitably this is little enough, and the importance of the departments require a creditable equipment.

Engineering Hall.

The Engineering Hall is to be practically a duplicate of the Science Hall, upon which \$25,382.26 has just been expended in the buildings alone. This does not include the foundations, which were, of course, not damaged by the fire, and in the

case of the Science Hall a large proportion of the brick was suitable for use. In the new Science Hall slow-burning construction was used, and the building is worth at least \$5,000 more than the original building.

The appropriation asked will not leave much margin, it will be seen, if a duplicate building is to be erected for the engineering departments.

The Science Hall accommodates the Department of General Chemistry, Agricultural and Analytical Chemistry, Mineralogy and Geology, Biology and Physics, besides basement and attic.

In the Engineering Hall will be installed the Departments of Mechanical, Electrical and Civil Engineering and laboratories for the Mechanical and Electrical Engineering Departments.

The Heat and Power plant will require additional equipment in way of dynamos, engines and boilers, and some extension in the building to enable it to carry the extra lights the increasing number of new buildings make necessary, and to provide heat and power.

Heat and Power.

The estimate—\$7,500—is not excessive.

An extension to cost about \$1,000 is very much needed to the Forge and Foundry, and some arrangement for heating the sand in use in the foundry, so it can be worked for purposes of instruction.

Forge extension and equipment.

Twenty forges and twenty sets of tools and some minor details bring the amount necessary for this department to \$2,500.

An exhaust fan and shaving house is needed, and some improvements to boiler-house, and dry kiln, milling machines, crank shaper, turners, for purposes of instruction, and a large engine lathe for commercial purposes are among the immediate needs of the shop. These with some minor items make up the \$4,000 estimated.

Shop improvement and equipment.

In this department there are 312 students.

For the immediate uses of the Department of Chemistry not less than the amount estimated (\$7,500), would furnish an equipment at all adequate. The estimates furnished of what was considered of prime necessity put at \$9,300.

Department of Chemistry.

There are 246 students in the several departments, many of them taking several branches.

The estimate furnished by the Professor of Biology of the actual loss to his department in the burning of Science Hall is \$770—\$500 is suggested for this department.

Biology.

A moderate estimate of the amount necessary to put the Department of Geology in any respectable shape is \$4,000. The professor in charge lost greatly more than that of his personally collected specimens, etc., which he was using in his work.

Geology.

There are 73 students in this department.

**Physics** To at all reasonably equip the Department of Physics not less than \$4,000 is needed, and it is one of the vital departments of scientific work as is shown by the fact that 312 students are now being handled in it.

**Mechanical Engineering.** In the Department of Mechanical Engineering, not including mechanical drawing, 110 students are enrolled. The first estimate of the Professor of the amount needed to suitably equip this department was over \$32,000—to cut this to \$7,500 is radical, but necessary.

**Electrical Engineering** In the Department of Electrical Engineering 174 students are at work, and not less than \$5,000 will put the department in any respectable shape.

**Civil Engineering** For the Department of Civil Engineering, in which there are 170 students, the Professor needs fully \$2,500 for his equipment, and in this he estimates the purchase of a number of second-hand instruments.

**Departments not especially named.** For General Equipment at least \$5,000 more is needed. This is for such departments as mechanical drawing, 335 students, and others not specifically enumerated. Many students take several classes in one department. All figures given are for individual students enrolled.

**Total moderate by comparison with other Institutions.** The total for the buildings and equipment is \$150,000, and while it may seem a large sum, is not excessive, but really is extremely moderate, and seems almost nothing compared to the splendid equipments of many institutions, and really does not compare to the equipment actually installed in many smaller institutions even in the South.

Purdue University, Indiana, has—

A \$40,000 electrical engineering building;

A \$40,000 civil engineering building;

A \$90,000 mechanical building and laboratory.

\$170,000 for the three departments, and in addition has \$100,000 in equipment.

Stevens Institute, Hoboken, N. J., with about 300 students, has an \$85,000 building, with a \$20,000 equipment in one department of engineering.

Madison, Wisconsin, has a \$30,000 mechanical laboratory, equipped; a \$7,000 machine testing laboratory, not including building; a \$25,000 hydraulic laboratory, and is putting in, at heavy cost, a new mechanical laboratory for steam and gas engine work.

**Southern Institutions.** The Alabama Polytechnic Institute, with 525 students, has \$10,000 invested in its electrical equipment, and V. P. I. has \$2,000.

Clemson College, South Carolina, with 673 students, has a \$10,000 electrical equipment.



These comparisons are of value as showing what other States are doing in equipping similar institutions.

The following extract and tabulation, taken from an article in the Tradesman, of January 15, 1906, from the pen of Dr. Brown Ayres, president of the University of Tennessee, shows the stand V. P. I. holds among Southern institutions, as measured by the number of students in the several departments of engineering.

"The table below gives the names of the institutions giving engineering instruction in the South, with the numbers of students (approximate) following such courses in the session of 1904-05, and the numbers graduating in such courses at the close of the session of 1905, as reported in the respective catalogues:

STATE AND INSTITUTION	No. Engineering Students—1904-05.	Engineering Grad's 1904-05.
Alabama—University of Alabama	22	3
Alabama Polytechnic Institute	315	95
Arkansas—University of Arkansas	310	10
Georgia—State A. & M. College	66	8
Georgia School of Technology	304	30
Florida—University of Florida	34	2
Kentucky—State College of Kentucky	254	31
Louisiana—Tulane University	166	15
Louisiana State University	122	9
Mississippi—University of Mississippi	42	3
North Carolina—N. C. A. & M. College	255	34
South Carolina—Clemson College	317	51
Tennessee—University of Tennessee	110	7
Vanderbilt University	77	6
Texas—University of Texas	218	4
Texas A. & M. College	284	28
Virginia—University of Virginia	88	4
Virginia Polytechnic Institute	500	40
Washington and Lee University	86	9

It thus appears that these twenty Southern institutions are giving instruction along technical lines to 3,700 students, but of these only 346, less than 10 per cent. graduate. Two institutions at the North, Cornell University, and the Massachusetts Institute of Technology, have nearly as many students as all our Southern institutions and graduated in 1904, the number of 438, or ninety-two more than our total.

What is the cause of this poor showing—imperfect preparation of the institutions to do the work, lack of appreciation of what we have in our Southern schools, or lack of preparation on the part of students to follow the courses offered them? All these causes are potent. For lack of funds our Southern schools are not in a position to be compared with many similar schools at the North, either in equipment or in the number and ability of their faculties. This is greatly to be regretted, but it is hoped that time will bring about a change in this condition of things."

#### Deficit in Current Expenses

To meet a deficit in current expense for the past two years, the sum of \$20,000 is asked.

**Deficit.**

**Increase of price of Board.** Year before last a balance at the end of the year showed loss in the boarding department, but it was thought that this could not be corrected the next year, without increasing the price of board, but last year there was some less again.

The Board of Visitors last summer raised the price to be charged for board this year. The effort is to keep down all expenses to students as much as possible, but after a thorough investigation it was found necessary to increase the price of board to \$11 per month.

**Insurance.** The item of insurance and repairs is steadily on the increase, with the growing number and size of the buildings to be cared for. This item is now \$7,000.

**Policy toward Farm and Garden department.** The policy of the College has been to allow the farm and the horticultural department to have all the receipts and in addition it has been necessary to appropriate an average of \$3,000 to \$5,000 extra to their support.

This has been done, as they are both regarded as departments of instruction, and are now on that basis.

**Put on experimental basis.** It is not quite reasonable to expect these departments to be run on a paying basis in the conduct of experiments on a large scale, and if the work undertaken proves of value, as is confidently expected, to the farmers of the State, by showing what is to be avoided and what adopted, the outlay is an eminently proper one.

**Salary Increases.** Another reason for this deficit in current expenses is the steady increase in the cost of instruction.

Some years ago the scale was adopted starting a full professor at \$1,500, and this to increase by \$100 a year till \$1,800 was reached, when the professor would be entitled to a house or \$150 commutation.

**Number of Professors.** Reports show that last year there were 15 full professors, 13 adjunct and assistant professors, 26 instructors and 7 clerks.

This year there are 19 full, and 12 associate professors, 23 assistants and 9 clerks.

**Student Assistants** As the attendance increased for years the only means of meeting the imperative calls for assistance from the several departments of instruction was the employment of graduate students as assistants in the shops, laboratories, drafting rooms and lower classes.

Pursuing studies for higher degrees, they were willing to assist in the work of instruction for the small sum required to meet the cost of their residence at V. P. I. They received \$250 for the year. Before the end of their first year many of them were tempted away by advantages offered in their chosen line of work, and the majority left at the end of the first year after winning their degrees, just when the

experience acquired in teaching began to make their services of real value to the College.

Such a plan was necessarily temporary, and only justified the exigencies of the case.

The addition of several professors and a number of instructors to the permanent teaching staff within the past year or so has added its quota to the growing current expense account.

**Additional Professors and Instructors.**

Within the last year it has been necessary to readjust the salary list of the Agricultural Experiment Station at the request of the United States government. Professors who have work in both College and station are paid a part of their salary from each institution. The government inspector thought too great a proportion was on the station, and the readjustment put some increased burden on the College. Then, too, with the growth of the Institution comes increasing expense of coal, janitors, etc. Treasurer's report of June 30, 1904, shows salary roll, \$50,162.65, and for current year it is \$65,000.

**Salaries shifted at request of U. S.**

In thus explaining the causes of the deficit for the last two years the necessity for the increase asked in annuity is shown.

**Need of increased annuity.**

The estimate of receipts and expenditures for 1906-7-8 show expenses estimated .....	\$117,650 00
Income .....	\$ 63,825 00
Present annuity .....	40,000 00
	103,825 00
	\$ 13,825 00

**Estimates of Receipts and Expenses.**

The increase in annuity asked is \$15,000.

In the estimate the creamery, laundry, uniform and boarding departments are not included as they are supposed to be self-sustaining.

The increase asked is absolutely necessary if the present state of efficiency is to be continued. As it is, more instructors are much needed.

To fail to grant this increase would be to cripple the efficiency of the Institution vitally.

The value of the training given the youth of the State is not easy to measure.

Entering college and surrounded there for years by an atmosphere of work, taught the value of self-help, self-reliance, imparted aptitude for work and respect for it, they have been fitted by a judicious combination of theoretical and practical instruction for immediate entrance upon lives of scien-

**Training given.**

**Incentive to Self-help.**

tific and industrial activity, offering lucrative and honorable employment.

**Aid to  
Students**

And the College has, by the moderation of its charges and by its policy of offering paid-for work—waiterships in dining-hall, firemen's places in the engine, dynamo and boiler rooms, milkers' and feeders places at the barns, clerkships and messengers' places in the offices, and many similar positions, brought this training within the reach of promising and enterprising youths of the narrowest means—youths who would have been unable without such help to secure any collegiate training whatever. And hundreds of young men have eagerly seized the opportunities thus opened to them.

Applications in increasing numbers pour in for every position offering employment. Appointments to such positions are limited to students who have been tested and have good class and military standing.

More than 100 are filed for 25 waiterships in the dining-hall.

Many letters begging for employment to enable the writers to secure an education are of the most deserving description. Each year from 50 to 75 boys have been enabled by the help of such positions, partly to meet their college expenses. Graduates trained by such methods have rapidly won positions of honor and trust.

A careful examination of the foregoing will show how steady and comparatively rapid has been the growth of this institution; how important are the buildings and equipment enumerated, in order to enable it to reach that state of comparative completeness now so nearly within reach, and how necessary is the increase in annuity that is asked, not only to make development possible, but actually to continue as at present.

For the Board.

JOHN THOMPSON BROWN,  
*Rector.*