FIFTH

ANNUAL REPORT

—OF THE—

Agricultural & Mechanical College

OF TEXAS.

SESSION 1880-81.

POSTOFFICE AND RAILWAY DEPOT:

COLLEGE STATION, BRAZOS CO., TEXAS.

1881.

PRESIDENT'S REPORT.

PRESIDENT'S OFFICE,
A. AND M. COLLEGE OF TEXAS,
COLLEGE STATION, June 19, 1881.

To the Honorable,

THE BOARD OF DIRECTORS:

E. B. PICKETT, - - Liberty.
GEORGE PFEUFFER, New Braunfels.
T. M. SCOTT, - - - Melissa.
C. C. WIGGIN, - - Houston.
J. G. GARRISON, - Henderson.

GENTLEMEN—I have the honor to submit the Fifth Annual Report of this College.

ACADEMIC DEPARTMENT.

The instruction has been given by the following

FACULTY.

JOHN GARLAND JAMES,
Mental and Moral Philosophy and Political Economy.

JAMES REID COLE, A. M.,
English Language, History and Literature.

CHARLES PATRICK ESTILL, A. M.
Ancient Languages.

HARDAWAY HUNT DINWIDDIE,
Physics and Chemistry.

MARIE EWALD BERNHARD GEORGE GARTNER,
Modern Languages.

D. PORT SMYTHE, M. D.,
Biology, Hygiene and Veterinary Science.

CHARLES C. GEORGESON,
Agriculture and Horticulture.

LOUIS LOWRY McINNIS, A. M.,
Mathematics.

FRANKLIN VAN WINKLE, M. E.,
Engineering, Mechanics and Drawing.

The plan of instruction prescribed by the Board at its meeting in July last, embracing two Courses of four years each—1st, Agriculture, 2d, Mechanics—as a substitute for the former system of elective studies, has been faithfully carried out, and with satisfactory results.

The two Courses branch in the Sophomore year—the Freshman year being a common preparation for both.

ROLL OF STUDENTS.

SESSION 1880-81.

Seniors.

G. H. Dugan,	Sherman,	Mechanics.

Juniors.

Searcy Baker,	Plantersville,	Mechanics.
F. W. Brooks,	Waco,	do.
W. Campbell,	Tilden,	do.
C. G. Dwyer,	Brenham,	do.
J. M. Hall,	New Waverly,	Agriculture.
S. A. Hare,	Sherman,	Mechanics.
S. F. King,	Bell's,	Agriculture.
R. S. Lipscomb,	Grapevine,	Mechanics.
G. S. H. Pfeuffer,	New Braunfels,	do.
N. A. Shaw,	Clarksville,	Agriculture.
H. Stinnett,	Sherman,	Mechanics.
F. Talbot,	Calvert,	do.
J. W. Thomason,	Huntsville,	do.
D. H. Watson,	Brenham,	Agriculture.

Sophomores.

R. L. Allen,	Bryan,	
M. F. Armstrong,	Buck Horn,	Mechanics.
J. S. Bradford,	Hempstead,	do.
J. McL. Burford,	Weimar,	do.
D. A. Chambers,	Clarksville,	do.
W. M. Crisp,	Columbus,	Agriculture.
J. R. Cravens,	Haught's Store,	Mechanics.
L. R. Davis,	China Springs,	do.

D. C. Ragsdale,	San Marcos.
H. L. Robb,	Trinity.
C. W. Robinson,	Cold Springs.
Lee Robinson,	do.
Moran Scott,	Gainesville.
Carter Sessions,	Bonner.
E. S. Smythe,	A. & M. C. of T.
G. V. Spann,	Brenham.
S. K. Spann,	do.
A. L. Steel,	Fort Worth.
D. L. Steele,	Elysian Fields.
W. T. Stewart,	Gertrudes.
W. H. Stoner,	Victoria.
R. E. Swanson,	Houston.
J. Talbot,	Calvert.
W. P. Talbot,	do.
S. T. Tooke,	Weimar.
J. B. Towns,	Madisonville.
W. L. Tuller,	Galveston.
E. W. Voelkel,	Shelby.
A. O. Watson,	Brenham.
J. M. Wesson,	Navasota.
M. S. Westbrook,	Mastersville.
N. M. Williams,	Winchester.
S. J. Winston,	Richmond.
A. A. Wyse,	Bryan.

RECAPITULATION.

Seniors,	1
Juniors,	14
Sophomores,	29
Freshmen,	83
Aggregate,	127

The attendance upon the optional courses in Ancient and Modern Languages will be found in the reports of those departments. The main work of the college for the past year has been fully in harmony with the objects of its creation. The instruction given, both in theory and practice, has made it for the first time *in reality* a school of Agriculture and Mechanics, in which every student, whatever his object in entering, *must* receive thorough and extensive training in one or the other of the leading features. When the great disadvantages under which so radical a change in the policy of the school are remembered, the results are certainly noteworthy and satisfactory, and suggest strongly the propriety of making only such changes in the present programme as the legitimate development and extension of the technical courses require to increase thier practical value. In my judgment there is still undoubtedly too much time allowed for instruction in branches non-essential to the leading objects for which the college was founded—subjects which in themselves are assuredly of value, but which have only a remote connection, if any, with professional training in agriculture and mechanics, and which should be pursued exhaustively in some other institution of different aims. I allude more particularly to metaphysics, ancient and modern languages and literature, and military science—the time allotted to which is out of proportion to their real importance in a college whose primary object is industrial and scientific training. A reduction in these courses seems essential to the value and efficiency of the practical work in mechanical, physical, chemical and agricultural laboratories, the time for which during the past session has been entirely inadequate. For details of each separate department, reference is made to the accompanying reports.

Industrial Department.

The results in this department must, after all, be the test of the success of a college which professes to train agriculturists, horticulturists, machinists and engineers. The farmer or machinist is not made by study of *words* and *theories*, which is

well enough in its place, but it is of prime importance that, as a supplement to such study, he should be brought in constant contact with the tools of his profession, should understand the principles of their construction, and acquire that skill in their use which *practice* alone can give, and should be made continually to apply in the shops or fields the scientific principles of the class-room. By being a skilled workman himself, he will thus become a judge of good work, a master of all the details of his profession, and be able to direct with advantage the operations of those who may be under him in after life. For the college aims, by conducting his general and scientific culture parallel with his practical instruction, not to make the student a mere laborer, but to qualify him for the broadest professional usefulness and success, and for the highest stations in society.

The practical instruction here has been carefully conducted in conformity with this view, and with gratifying results, which would have been still more gratifying had the present schedule of studies permitted more time for practice. As much of the machinery had to be made to order after the professor of mechanics arrived in October last, the shops could not be gotten ready for use before the beginning of the second term, when the industrial duties of each course were begun in the Senior, Junior and Sophomore classes, and continued regularly three hours a day two days a week, until the close of the session; the agricultural students going to the fields and gardens, the mechanical to the shops. Great interest has been manifested by the students from the beginning, and as the object and value of these exercises become more and more apparent, the interest steadily increased, so that it was a source of constant regret that the time for practice was so limited. If the agricultural and mechanical courses here are to be developed so as to be of great practical value, it is necessary that the time for practice be largely increased, so that *daily* exercises may be required. This time can be easily gained by cutting down the time now spent in the study of books and recitations thereon, which is disproportionally great for the real objects of the college.

So far from there being, as some suppose, no demand for industrial education, the applications received show a steady and increasing desire for it on the part of our youth—many of whom are anxious to work out part of their expenses, if the college can

use their labor at ordinary wages. And many of the students who were originally attracted here because of the advantages offered for fine literary training at low cost, are having their minds turned into entirely new channels by the value and attractiveness of the technical courses which are being so prominently developed now, and which are surely working a radical change in the results of the college. It is greatly to be desired that the resources of the college, in shops, farm and funds, were large enough to receive all worthy young men who desire to enter and labor for their education. When this can be done the college will then be brought in valuable and intimate relation with the industrial classes, for whose benefit it was expressly intended by the act of Congress, and who are now virtually excluded, unless they are made the beneficiaries of the act passed by the late Legislature, by the voluntary action of the State senators and representatives.

THE FARM.

The farm has this year for the first time been nearly self-supporting—having supplied the Mess-hall with all the pork needed, about 5000 pounds, a large quantity of lard, and an abundance of choice vegetables, and raised fair crops of corn, forage, cotton, etc., Two bales of cotton, picked by the students, were sold by John D. Rogers & Co., of Galveston, who generously declined to charge anything for their services. The hogs we are breeding are pure Poland Chinas, and we hope to add several other breeds this coming session. It is earnestly desired to begin the breeding of blooded cattle next fall, and with a view to that I have had enclosed about ninety acres of land on the east boundary of the college tract, which makes a pasture admirably adapted to the purpose. Besides being a highly attractive feature to students and visitors, the stock purchased for the college will soon pay for themselves with the milk supplied by them. Undoubtedly the main object of the farm should be to supply for the student a laboratory for instruction in which the practical part of his profession, and the most valuable, is to be learned. In it he has to be taught farm organization and economy, the best methods of culture for staple and special crops, the use of the most improved machinery, and made to apply as far as possible all the principles of the science of agriculture ac-

quired in the class-room, and to assist the Professor in conducting experiments whose results may be of value or interest. It can, therefore, never be made self-sustaining when a large number of students have to be instructed, for a much greater amount of machinery and tools for practice must be kept than an ordinary farm requires, and much of the labor performed will be without pecuniary result to the college. The returns in cash must be incidental to the main object of instruction, and will never be large. In this connection it is well to say our present enclosed tract is too small for using advantageously the large number of students which the State will send here next fall in the department of agriculture. At least one hundred acres more should be taken in, and additional mules, machinery and tools purchased to supply ample facilities for instruction. The fencing can be done by the students, if the materials be supplied. The college at present has barely sufficient implements and stock to run the farm *as a farm* simply, without reference to its true relation to the college, as the most important factor in the leading course of instruction. The growing crops speak for themselves and for the Farm Superintendent, Mr. E. Kellner.

THE SHOPS.

In October last I turned over to Prof. Van Winkle the two-story wooden building, known as "North Barrack," which he so reconstructed as to arrange therein, on the ground floor, his series of shops, tool room, engine room, etc., as explained in the cut elsewhere. This department of instruction is one of the most attractive features of the college, and is destined to be, when properly developed, of vast importance to the manufacturing and mechanical interests of this State. The students will give during commencement week a public exhibition in the shops of their knowledge of steam enginery, machinery and wood-working tools, which will admirably illustrate the system under which they have been trained. The shops are a *model*, and have greatly pleased all the machinists and manufacturers who have visited them —being equipped with the most improved tools and wood and metal-working machinery, as far as the equipment goes. But they are already too small to meet the demand for instruction, and must be materially enlarged by next session.

This can be done by using the upper story of the building for instruction in carpentry for the lower classes, to equip which additional sets of tools can be procured for a few hundred dollars.

In the machinery department an upright drill and an iron planer are needed badly, both of which could be purchased for less than $1000. They should be supplied by some of our wealthy manufacturers or railroad owners, who are certainly deeply interested in the early and proper development of mechanical education in Texas. I shall make a personal appeal to the most prominent of them this summer, and, it is hoped, not in vain. The effort will be made to have a small cotton gin placed here by the manufacturers, which can pay for itself by ginning the crop of the vicinity—there being no gin near us. Should this succeed, a small grist mill, which is really needed here, can be added at little expense, as we have already steam-power sufficient for all. A thorough mechanic will be needed next year to assist in the practical instruction, and he can be utilized in constructions, repairs, etc., so as to be no additional charge on the college. Insurance to the amount of $2500 has been effected on the tools and machinery.

PHYSICAL AND CHEMICAL LABORATORIES.

These laboratories have been fitted up with extensive and most valuable apparatus, at great cost, and constant work in them is of the highest importance to him who would rightly understand and apply the laws of the physical universe upon which the industrial arts are founded. The work accomplished during the session has been of value, it is true, but entirely too small in amount, owing to the absorption of time by other departments. This should be remedied another year. No laboratories comparable to these exist elsewhere in the State. In them the student finds ample facilities for practice in quantitative and qualitative analysis of all substances, organic and inorganic, and for investigating experimentally the laws of heat, light, electricity, hydraulics, statics, magnetism and other branches of physics, and for acquiring a practical knowledge of microscopy and its applications in the arts and sciences. He does not simply

see the apparatus used, but *is made to use it himself*, and is constantly incited to make original researches in physics and chemistry. Most of the practical work this year has been done by the Professor, upon whom numerous calls have been made for analyses of mineral waters, soils, minerals, etc. A suitable gas apparatus for heating purposes is the most pressing need of the chemical laboratory.

MILITARY DEPARTMENT.

The instruction has been given by Capt. Geo. T. Olmsted, Jr., U. S. A., and is required in the act of Congress. It is limited to the drills and other usual duties of a military post—no class-room recitations being required. It is earnestly recommended that the maximum time for instruction be fixed at a low figure, and that students be not required to wear uniforms except when in ranks under arms. The following is the

MILITARY ORGANIZATION.

Capt. Geo. T. Olmsted, Jr., U. S A., Commandant of Cadets.

STAFF.

H. G. Stinnett,	1st Lieut. and Adjutant.
L. R. Davis,	1st Lieut. and Quartermaster.
W. Campbell,	1st Lieut. and Private Secretary.
David Rice,	Sergeant Major.
J. W. F. Furrh,	Color Sergeant.
A. Talbot,	Quartermaster Sergeant.

Co. A.	Co. B.
Captain, S. A. Hare.	Captain, G. H. Dugan.
1st Lieut., D. H. Watson.	1st Lieut., G. S. H. Pfeuffer.
2d Lieut., C. G. Dwyer.	2d Lieut., R. S. Lipscomb.
3d Lieut., W. M. Crisp.	3d Lieut., Searcy Baker.
1st Sergt., W. T. Armstrong.	1st Sergt., W. B. Ford.
2d " S. F. King.	2d " Jno. W. Thomason.
3d " A. A. Wyse.	3d " J. C. Caldwell.
4th " E. McDaniel.	4th " J. C. McCarty.
1st Corp., C. S. Graves.	1st Corp., J. S. Stewart.
2d " C. L. Lauderdale.	2d " V. J. Long.
3d " A. B. Griffith.	3d " J. McL. Burford.
4th " F.R.Von Bieberstein.	4th " J. R. Cravens.

MISCELLANEOUS.

I respectfully recommend:

That one hundred dollars be appropriated from the Contingent Fund of next year for the library.

That students in analytical chemistry be charged a small fee for chemicals, etc., consumed.

That the class of Biology and Veterinary Science be united with that of Agriculture.

That in future a committee of your Board attend the final examinations of the classes.

That the present medical fee of $13 charged all students be abolished, or very greatly reduced. Students should pay medical bills only for services rendered when sick, and the college should not become responsible for such bills.

That the duties and responsibilities of the farm superintendent be more clearly defined.

That it be made the specific duty of the scientific chairs and the President to begin at once the organization of a museum of agriculture for the college, by collecting specimens of soils, seeds, plants, ores, minerals, building rocks, timbers, grasses, insects, curiosities, etc.—in fact, of every thing which can help illustrate the natural resources of our State.

That the Board urge upon the Legislature at its next meeting the importance of adopting the recommendation made by the Governor to amend the present law, so that the interest on the federal endowment may be used for other purposes besides the payment of professors' salaries.

As the books of the college can not be closed before the 22d inst., the financial statement can not be presented un-

til then, when detailed accounts and vouchers will be submitted, showing the expenditures of the State appropriation, and the operations and present condition of the college—with which it is hoped you will be highly gratified, as the institution is, financially, in far better plight than it has been for years past.

With great respect, I remain

Your faithful servant,

JNO. G. JAMES,

President.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE AND HORTICULTURE.

PRESIDENT J. G. JAMES:

SIR—I herewith respectfully submit my report of the Department of Agriculture and Horticulture for the past session.

I have, during the whole session, given instruction in agriculture and horticulture to those of the older students who have chosen the agricultural course. The class numbered in the first term eight members; three of these left college during the session, leaving only five at present. As laid down in the catalogue of last year, all the Freshmen are also in the agricultural course, but being hard pressed with studies in the fundamental branches, it was thought best to defer the technical studies till they were better prepared to take them up. The subjects gone over during the first term in agriculture were: The Soil—its constituents, origin and formation, classification and physical properties. We next completed a course in drainage. Both subjects were taught by lectures.

In the second term the class received full instruction in vegetable gardening, and irrigation. The former was taught by lectures, for the latter we used Stewart's text book. It has been my object throughout to make the instruction as practical as possible, and the work in the class-room has been complemented by frequent illustrations and out-door work, especially is this the case with the gardening. It gives me pleasure to add that the class has made very satisfactory progress. The scope and character of the work may be learned from the examination questions, herewith submitted.

I also taught geography to the entire Freshman class during the first term; and mathematics (arithmetic and algebra) to a section of that class in the second term. The progress in these studies has, on the whole, been good.

PRACTICAL INSTRUCTION.

in farm and garden operations has also been given to the students in agriculture for four hours each week during the past term. They have thus grafted a number of pear

stocks, which were purchased for that purpose, a work which proved highly interesting; they received instruction in the formation and care of hot-beds and cold frames; they assisted in pruning the orchard, in the planting of the seeds and care of the young forest trees, in the planting and care of vegetables, etc., and they have also had practice in handling plows, cultivators, mowers and other farm implements.

I may be pardoned for adding here that I consider work of this character an essential feature in the education of agriculturists. That an apprenticeship in practical work is necessary for a practical farmer, few will have the hardihood to deny. How else can he know what constitutes a fair day's work? or, how can he do, or direct the doing of, a thousand and one things in which experience alone can have trained the judgment? The truth of this proposition being granted, the question is reduced to this: is it proper and expedient to acquire such experience at an agricultural college? I am aware that many people—and among them some eminent educators—would give a negative answer; but it is difficult to see how an institution which professes to teach practical agriculture can, in justice to the student, withhold practical experience in work. Some young men may, indeed, consider it a hardship, but these can hardly entertain serious thoughts of adopting agriculture as a profession. The most eloquent argument in favor of practical education in this respect is, perhaps, the fact that the most successful agricultural colleges in America, those whose graduates engage very largely in agriculture as a profession, and do it, as a rule, with eminent success, have all adopted some system by which the students are required to devote part of their spare time to practical work. A student may be told how to graft, and bud, and prune, and plant a tree, and he may even see it done, but if he never does it for himself he will be about as proficient in the art as a scholar can be in arithmetic by learning the rules without ever working an example.

THE FARM AND GARDEN.

The total area under the plow this year is 53 acres, divided between the following crops, viz: corn 24 acres, oats 3 acres, cotton 2 acres, millet 3 acres, vegetables and experiment plots 10 acres, and orchard 11 acres. The cultivation of these crops has been under the direct management of Capt. Kellner, Farm Superintendent. The area has proved too large for the two, and during the spring three, hired men allowed the Department. The work has also been considerably augmented by the many odd jobs about the buildings and Mess Hall, which have devolved upon the men of the farm. The farm crops are, at this writing, in

excellent condition, but it has been found impossible with so few hands to give the attention to experiment plots, young trees, and plants of all kinds, that these should have, and must have, if results at all satisfactory are to be reached. Besides, the place needs improvement in every particular on the farm, garden and grounds, but with so small a force the progress must necessarily be slow. It is wasted labor to plant trees, lay out drives, etc., if means are not provided for their preservation and care afterward. I respectfully suggest that, if possible, a few hundred dollars be set aside, or made distinctly available, for the hire of labor, so that the improvements of the farm and garden, and the appearance of the whole campus shall not be entirely dependent upon the contingent fund. Experiments, also, are utterly worthless unless they can receive careful attention, and at exactly the right time. It is undoubtedly the province of this department of the college, not only to teach agriculture to the young men who may avail themselves of the opportunities offered here, but also to work for and with the farmers throughout the State in the solving of the many questions of interest to them, and for the general advancement of agriculture. Careful testings of all kinds of agricultural plants, and of varieties not generally known, whether corn, cotton, grasses, trees, etc., or improved methods of culture, may prove of incalculable value. But, whatever the result of such work may be, the investigations which lead to it are more or less expensive.

The Mess Hall has this session been supplied with vegetables from the garden to the value of $170.26.

The Horticultural branch of this department is now so far developed that it has become necessary to employ a man with some experience in that line to work in the garden and tend to all related interests. There is constant work for one man, and it will be economy to employ one who is familiar with the work, though his wages may be somewhat higher than that of a man working on the farm. I respectfully urge the hiring of such a man early next spring.

There are now twenty-five varieties of grape vines in the garden, of which twenty varieties are from cuttings purchased this spring, and therefore still young plants. The object is to increase the stock by propagation till we can plant a vineyard, and also to add to the number of varieties so as to compare them together and report upon their merits. The orchard is in a fair condition, and will this year bear a little fruit. It is to be regretted, however, that none of the trees are labeled. Many of the trees need straightening and stakes. A start has been made in the ornamentation of the grounds by planting three hundred

shade trees and shrubs this spring in groups near the buildings. With the exception of four evergreens, all are at this time doing splendidly. Seeds of a large number of forest and shade trees were planted during the winter, but, on account of dry weather in the spring, only about thirty species have come up, and some of these not very well. The experiment will be repeated.

Small patches of cotton are grown of the following varieties, viz. Browning, Jones' Improved (imported from Georgia), Sea Island and Senegambia. Seed of the last was sent us by his Excellency, Governor O. M. Roberts. The thanks of the department are also due to Mr. J. T. Lovett, Little Silver, N. J., for grape cuttings; Mr. T. V. Munson, Denison, for quince cuttings; Dr. Canfield, Wellborne, for seed of upland rice; Mr. G. H. Hogan, Ennis, for sample of Texas blue grass, and to S. H. Fox, 1225 N. Fifth street, St. Louis, for a "bug and worm exterminator."

LIVE STOCK.

Last fall forty-nine head of hogs were purchased at $2 per head, and also a Poland China boar and two young sows for $35. The investment has proved a profitable one. The Mess Hall has since been supplied with pork to the value of $219, and we have at present fourteen sows and forty-two pigs, eight of which are thoroughbred Poland China, the remainder half-bred. Another young mule has been purchased this summer, making four mules in all belonging to the college. In regard to cattle, I can not do better than substantially repeat what I said in my report to Col. Peeler five months ago. The college does not own a single cow, or live-stock of any description, except what is mentioned above. As a means of instruction, it is of paramount importance that a few of the leading breeds of cattle be represented here in order to give the student an opportunity to see, compare and handle them. We feel the want of them continually. I deferred instruction in live-stock to the agricultural class this session because we had no thoroughbred stock to refer to for illustrations. Once purchased, they could readily be made a source of income. There is a market for the milk here at the Mess Hall, and the young animals could be reared for beef or for breeding purposes, as the case would warrant. A pasture of eighty acres has recently been fenced in, in the hope that means may be provided in the near future for the purchase of a few head of cattle.

IMPLEMENTS AND MACHINERY.

Some additions to the stock of farm implements have been made during the session by the purchase of a wagon, a mower, a corn and cotton stalk cutter, a cart, a planter

and cultivator, and some hoes and spades, all of which were much needed. A single and double harness have also been bought.

METEOROLOGY.

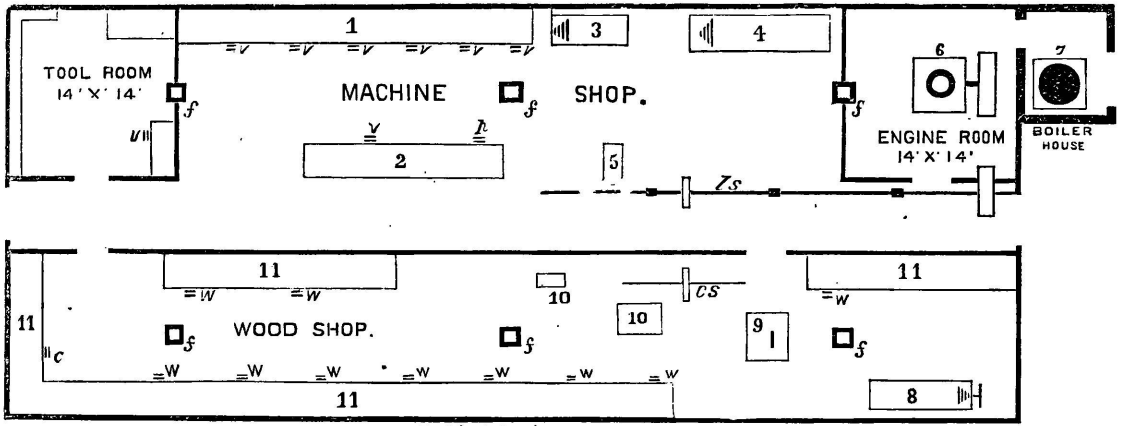
A set of meteorological instruments is *en route* for the college from the signal service office, Washington, D. C. When set up, a full daily record of the temperature, rainfall, humidity of the air, winds, etc., will be kept and periodically published.

NEEDS.

The Department stands in immediate and pressing need of a tool-house. The floor of our small barn, which has heretofore served as a repository for farm implements, can no longer answer this purpose. The injury sustained by machinery from forced exposure will, in the course of a year, more than balance the cost of a suitable structure. It will also be necessary to provide some means of irrigating at least eight or ten acres of land. The absence of rain for considerable periods is liable to blast all prospects of success with many things, especially young trees, trial plots and the like. This point deserves the more attention, in as much as here are excellent facilities for irrigating a small area at comparatively little cost. A very capacious tank can be formed by building a dam at the lower end of the long and deep ravine running across the newly fenced pasture, and by the use of a small steam pump the water can be raised into a reservoir, and from there distributed over the land. About $600 will cover the expenses. If the improvements on the farm and campus, which I hope for, can be made in another year, a yoke of oxen and another mule team can be used to advantage. A small propagating house is also needed. These, with the means to hire labor, and some thoroughbred stock as mentioned above, constitute the more important present needs of the Department.

All of which is respectfully submitted.

CHAS. C. GEORGESON,
Professor of Agriculture and Horticulture.



84' X 34'

PLAN OF SHOPS.

1 Metal working benches.
2 Screw bench.
3 Speed lathe—Engine or foot power.
4 Engine lathe, 22x84,
5 Iron frame grindstone.
6 Vertical Engine, 8x9--Reversing Link.
7 " Boiler.
8 Wood-turning lathe.
9 Circular saw (iron table).
10 Fret saw.
11 Wood working benches.

V V, Metal working vises.
W W, Wood " "
c, Coach vise.
f f, Flues.
l s, Line shaft.
c s, Counter shaft.
p, Pipe vise.

Department of Mechanical Engineering and Drawing.

PRESIDENT J. G. JAMES:

Sir—I have the honor to submit herewith a report of the organization, work and condition of the Department of Mechanical Engineering and Drawing for the session of 1880–81. In organizing this department due consideration was paid to—

The wants and resources of the State.

The character of student material to be dealt with.

The appliances requisite for giving such a course of practical and theoretical instruction as would be most beneficial to the community and consequently most valuable to the graduate.

The urgent and increasing demands of the State are for skilled artisans—those who are able to do good, practical work, or take positions in manufactories and other mechanical pursuits as superintendents and foremen—whether in the construction and operation of railroads, cotton and woolen machinery, or building of structures and machines for developing our natural resources.

The immense water powers of Texas should be turned to good account in driving thousands of spindles and looms Capital, dormant or invested abroad in similar enterprises, is ready to lend its assistance in preparing our staple products for the large and growing demands of home consumption. But the State is almost entirely dependent upon foreign skill and labor in the mechanical pursuits, and the comparatively few enterprises already in existence are crippled and stagnated. The importance of the problem is fully appreciated, and it is incumbent upon us to find a speedy solution. The novelty of this course of instruction may require an exposition of its objects, which, being clearly understood, will serve as the best explanation of its details, viz: To give a good education based on mathematics, physical sciences and drawing, and a sufficient familiarity with their practical application in the mechanic arts to secure to the student a livelihood and to the State a valuable member of society in exercising and disseminating his technical knowledge.

The scope of a single trade is too narrow for purposes of instruction by classes: moreover, there are certain principles underlying them all. The great variety of tools used in mechanical processes of the present day are only combinations of a few elementary hand-tools. All pupils should,

therefore, take the same course of elementary instruction, after which, encouragement should be given in those special branches for which they show an aptitude. Students possess different talents to be developed—some exhibiting a tact for drawing and designing, others for directing operations or for mechanical manipulation; but, to be proficient in any industrial branch, a thorough knowledge of all pertaining to it is as essential to the director as to him who actually frames the house, bores the steam engine cylinder, or builds the structure or machine, Each must not only be familiar with his own work, but know exactly what to expect from those connected with him. In order to intelligently direct others, he must know their capabilities; to follow the directions of others he must know how to interpret and supply their wants. For practical instruction the student requires only physical strength and common sense. But text-books on mechanical subjects employ principles of mathematics, physics and chemistry, as well as those of practice. Instruction in these branches must, therefore, precede theoretical or text-book mechanics. Thus arranged, the practical value of the course is directly in proportion to the time spent. The student feels this, and is prepared to receive his theoretical training with higher appreciation and broader criticism.

THE COURSE.

The course of instruction is in three parts, viz:

Practice—Shop work and mechanical laboratory.

Drawing—Free-hand, geometrical and mechanical.

Theoretical—By lecture and text-book.

In the shops practical instruction is given—first, in elementary construction, that the pupil may acquire a most intimate knowledge of practice and skill in the use of tools and work-shop appliances. He is conducted through the shop exactly as though assuming the lowest place in a manufacturing establishment, successively filling higher positions, until finally graduated as superintendent. Practical instruction is never carried to the extent of weariness or drudgery, but is, on the contrary, a pleasant transition from study and recitation. All work is executed after drawings to which it must conform. Beginning with exercises in framing and joinery by use of hand-tools, the pupil is promoted to the use and care of wood working machinery, such as circular and fret saws, the turning lathe, and exercises in pattern making. He is then made tool and stock clerk and timekeeper, thus familiarizing himself with any special tools which may have escaped his notice in the wood department, and becomes acquainted with makes, sources and prices of the shop equipment. He then takes a course of filing,

chipping, screw cutting with taps and dies, and other vise work, and erecting of machinery; is then put in charge of the boiler, whence he is duly promoted to engineer to take charge of the power and its transmission. This is followed by a course in drilling, boring, turning lathe, screw-cutting and other machine tool work.

The above, including the bulk of shop practice, covers the first two years of the course, which, together with the preparation in other departments of the college, has laid the foundation for a course in Mechanical Engineering and laboratory practice. Beginning in the third year, lecture room instruction is given in the following subjects, the practical illustrations of which, together with the students' specially elected line of work, forming the basis of practice in the junior and senior years:

General properties of building materials.

Experiments on strength of materials.

Masonry, framing.

Bridges, roofs, roads, railroads and river improvements.

Iron, kinds of—manufacture of wrought and pig—mechanical properties.

Steel: kinds and how made, uses and how worked.

Shafting and transmission of power.

Study of construction and operation of steam engines; original essays and criticisms of machines and structures of various kinds throughout the course.

Special study of construction of the locomotive—from complete set of original working drawings—grist mills, cotton mills and machinery—silver mills—plantation machinery, railroad equipments.

DRAWING

is the short-hand language of modern science. It is a universal language, common to all men, showing at a glance what words would be inadequate to express, and is indispensable to the mechanic and engineer. The course begins in the first year, embracing lettering (free hand) sketching, geometrical problems and construction (with instruments), plotting of surveys and level section of drawing and elements of machines. In the third and fourth year elements of Mechanism, Descriptive Geometry, Shades, Shadows and Perspective; drawing of original designs for machines and structures, and drawing for graduating thesis. In the practical departments all students are required to provide themselves with two suits of blue jeans overalls, a standard 24-inch rule and pocket callipers for shop practice; and in the department of drawing a set of instruments—T-square and two set squares. This outfit of drawing instruments will cost the student about $8, and can be disposed of when

he leaves the college, should he so desire.

Shop and Equipment.

The "north barrack," a two-story frame building 84x34 feet, has been reconstructed for purposes of the shops, and a small brick extension built for boiler house. The tools were ordered early in the present session, and by time of their arrival—January 1st last—the wood room was properly fitted up with racks and benches for their reception, and were placed in the hands of the present junior class one week later. The machinery, in consequence of scarcity in markets and delays of transportation, was not all received until the middle of May; but this has in no wise interfered with the regular instruction of the classes, whose exercises in mill work have been turned to good account in setting the machinery and putting it in running order. Our present shop equipment consists of nine sets student's wood-working tools—fret saw, jig saw, iron table circular saw, (wood lathe and cutting off saw in process of construction). On the metal side of the shop, eight sets of vise tools, Prentice screw-cutting speed lathe, engine lathe, mounted grindstone, fifty feet shafting, 12-horse power engine with reversing link and indicator attachments.

Tool room—in which are kept a complete set of wood-working tools and supplies, and special tools for metal-working, as taps, dies, drills, reamers and small shop supplies. We are under obligations to A. Field & Sons, Tack Company, and American Screw Company, for fine mounted sample cards of their wares.

The drawing department is equipped with thirty-six boards and a set of instruments, but is greatly in need of tables.

Work of the Department.

As stated, the present junior class has been instructed in elementary wood-working and mill work since January 1st last. Besides their regular exercises, they have set the machinery and made their own drawing tables and chairs, and in several instances T and set squares, and most have received instruction in steam enginery. Both Junior and Sophomore classes have taken the regular course in mechanical drawing as laid down for the first two years, practicing four hours per week. Your attention is respectfully called to the work which has been executed. A delay of nearly two months was occasioned this department awaiting supplies of drawing materials. In the lecture room the Junior and Senior classes have completed Mahan's Civil Engineering and Compass Surveying and Levelling in Davies' Surveying, together with field work in use of level and compass, and exercises in plotting and profile section

drawing.

The work of the Professor in charge in attending to the details of organizing and equipping the department has interfered with but a single day's recitation, and in spite of the novelty of the course and short time devoted, the classes have equalled our most sanguine expectations.

CONDITION OF THE DEPARTMENT.

The appropriation of $4000 made by the State Board has been expended for the above equipment; the "tool book" shows the following relative costs of different parts of the plant:

Machine tools, 20 per cent.; wood-working machinery, 10 per cent.; hand tools, 12 per cent.; engine and boiler, 22 per cent.: transmission of power, 8 per cent.; transportation, 9 per cent.; tool room stock and special tools, 9 per cent.; reconstruction of barracks and drayage, 10 per cent.

We have at present accommodations for two classes of twelve each. By division of the classes into sections, it was expected to meet the present patronage of the college, but the large number of "State students," together with the others that may be expected, making the incoming Freshman class number more than fifty, will require increased facilities. At least twenty-five additional sets for elementary wood-working and twenty for iron are imperative requirements of the department if these students are to receive any of its benefits. These sets will contain only the most elementary tools, and can be furnished with benches and vises at $15 per set, making $675. The building can be otherwise put in shape for temporary use with an expenditure of about $50. This building, one of the old wooden barracks, is ill adapted to purposes of shops, being entirely too small and, without expensive alterations, is too frail for machinery. Originally used as dormitories, for the purpose of deadening sound between floors, it was constructed with a false floor below the second story, and this was covered with from three to five inches of sand, which sifts through at the slightest shock or vibration. This will in a short time ruin machinery and tools, is a constant source of annoyance to operators on the first floor, and should be removed before doing any serious damage.

From the isolated location of the college, and considering the few opportunities offered for study and observation elsewhere in the State, the student should here be brought in contact with a variety of first-class machinery, but the appropriation limits the department to that above enumerated—the only machine tools being a speed lathe and an engine lathe. The capacity for machine operations is consequently very small, and should be increased as soon

as practicable by at least a small iron planer and an upright drill. We are also greatly in need of a forge for at least sharpening and tempering tools; and should have a small melting furnace for making iron and brass casting, and for purposes of illustrating moulding and pattern making. It is to be hoped that before the incoming Freshman class have completed their elementary course with hand tools that provision will have been made for erecting a larger, more substantial and well lighted building equipped with a proper complement of good machinery and tools.

The aid of an assistant is absolutely necessary that the property of the department may receive the proper care and attention, and that the shop instruction of one section may be in progress during the class-room instruction of others in Engineering and Drawing—otherwise some part of the department must be practically abandoned.

I am, very respectfully yours.

FRANKLIN VAN WINKLE,
Professor Mechanical Engineering and Drawing.

Department of Chemistry and Physics.

PRESIDENT JOHN G. JAMES:

SIR—During the past session instruction in the Department of Chemistry and Physics has been given to the Junior, Sophomore and Freshman classes. The first term was devoted to an outline of General Physics. The Junior and Sophomore classes pursued this course with interest and profit, and at the intermediate examination almost every member of the two classes was required to illustrate important principles by the use of apparatus in the presence of the faculty and visitors. This was done without blunder or failure. The second term has been given to theoretical chemistry. This course has been a mere outline, because (under circumstances which it is hoped will not exist hereafter) the Faculty did not deem it possible to assign sufficient time for anything more. It is believed that the schedule for the next session will make ample provision for practice in the laboratories. Such work, and as much of it as possible, will be invaluable to the student for mental, moral and manual discipline. The Freshman class has finished a fair course of Physical Geography, and given much satisfaction by showing unusual interest and proficiency in the subject.

Apart from the regular academic work of the Department, time has been found for some chemical investigations. Complete quantitative analysis have been made of mineral waters from Luling and from Caldwell. Qualitative examinations have been made of waters from Bryan and from the vicinity of the college, also of dredgings from Sabine Pass and of minerals sent the college. The fitting and arrangement of apparatus, and the preparation of chemicals required by a new laboratory, has consumed much time. A mercurial pump, quick filtering apparatus and aspirators have been constructed, and many smaller pieces of apparatus made as they were needed. Except in the case of one piece, this work has been done by the head of the Department without any assistance whatever. It is very desirable that in the future students may have opportunities to develop their mechanical skill and ingenuity in this kind of work. Notes of all analytical work and observations have been kept, and it is intended to publish from time to time such abstracts of these as may seem of importance and interest to the public. Investigations have been commenced upon soils, which promise useful results.

Correspondence upon topics connected with agricultural chemistry has been invited through the newspapers, but little interest seems to exist on these subjects, nor is it to be expected that there can be any systematic co-operation in observation and experiment outside of the college till our own trained students begin to go out among the people. The appliances of this Department are now sufficient for most purposes. There is but one pressing need: that is gas for heating purposes. The worker who must rely on spirit lamps meets with constant annoyance and serious embarrassment, besides the greater expense of the heat. It is next to impossible to do the work required here in a reliable and expeditious way without gas. A warranted gas machine, with capacity for twenty-five burners, can be put up here for $200. I respectfully urge upon the authorities the great importance of this matter to the Chemistry of the Agricultural Department and as a matter of economy to the students who must use heat in the laboratory. I suppose provisions will be made by which students will be charged a special fee for chemicals and use of apparatus.

It may be well to repeat here the assurance that the instruction of this Department will be as much as possible given by practical work of the students themselves under direction, rather than by mere lectures or recitations.

Very respectfully,

H. H. DINWIDDIE,
Professor of Chemistry and Physics.

Department of Biology, Hygiene and Veterinary Science.

COL. JOHN G. JAMES,
President Agricultural and Mechanical College of Texas:

SIR—I beg to submit my first annual report of the Department of Biology, Hygiene and Veterinary Science.

Early in the course the difficulty of arranging classes rendered it impracticable for me to organize my class, but, in obedience to your directions, I delivered a *course of twelve lectures* on Hygiene to the entire corps. I only attempted to treat the subject in a simple and elementary manner to make it as free from technical difficulty as possible, and thereby present some useful, practical hints that all men can apply to the great purpose—preserving health. The following outline will show our scope and aims: *The air we breathe*—its impurities; importance of ventilation. The water *we drink*—its impurities; means of detection and removal. The *food* we eat—the amount and quality; the sources of adulteration, accidental and intentional. Clothing—quality; adaptation to climate and occupation. Personal Hygiene exercise—cleanliness, study, Labor and Sleep.

Brief and fragmentary as these mere outlines were, I have reason to believe that many of the corps became much interested in the subject, and will doubtless pursue it profitably hereafter.

At the opening of the second term I organized a class in Anatomy and Physiology, with three recitations a week, and, though the young men seemed very much over-worked, they entered on the subject with much zeal, and progressed very satisfactorily to the end of the term; and though the class was very small, it gave me opportunity, by means of well executed *plates, models*, etc., to make the course very full for the time allowed.

Hoping that we are about to enter upon a period of greater prosperity, it is my earnest desire that I may have a large class and wider field for work in future.

I am, very respectfully,

D. PORT SMYTHE, M. D.,
Professor Biology, Hygiene and Veterinary Science.

Department of Mathematics.

PRESIDENT J. G. JAMES:

SIR—I have the honor to submit the following report

of the operations in the Department of Mathematics for the session just closing.

There have been no students in the Senior class in this Department; the member of that class having completed the course in mathematics last year under the elective system. The Junior class studied during the first term, Plane and Spherical Trigonometry and Mensuration, using Schuyler's text, and, during the second term, Analytical Geometry (Bowser). Both of these subjects have been completed and carefully reviewed. In addition, I have given to the class a course of twenty lectures upon the general principles and applications of Analytical Geometry, and the discussion of curves of the second and higher orders. During the last term they have also studied Elementary Mechanics (Wood), having only two recitations per week, and finishing the first half of the text. This class has labored under the disadvantage of not being fully prepared for the Junior course, and therefore could not complete the same. The Sophomore class, during the first term, completed Plane, Solid and Spherical Geometry (Venable), together with weekly exercises in Inventional Geometry (Spencer), and, during the second term, Plane and Spherical Trigonometry and Mensuration (Schuyler), and chapters VII., VIII. and IX. of Davie's Bourdon upon the subjects: Formation of Powers, Extraction of Roots, Formation Properties, and Summation of Series; Logarithms, Interest, Combinations and Probabilities. In Geometry the text used abounded in practical applications, and theorems for original demonstration, in which I gave them an exercise each week.

The Freshman class has been divided into four sections. The first section completed Davies' Bourdon through chapter IX.; the second and third sections the same text through Quadratic Equations, chapter IV.; the fourth section has been able only to complete arithmetic (Venable). Those members of the first three sections who have passed a satisfactory examination, will be advanced to the Sophomore class. The fourth section, composed of very poorly prepared students, are now only ready to enter the Freshman class. My experience with the Freshman class during this session, leads me to the conviction that we can not have a satisfactory Freshman class until we have adopted a standard for admission. I would respectfully recommend that in my department a satisfactory examination upon arithmetic be made a requisite for admission to the Freshman class. During the first term Prof. Van Winkle had charge of two sections of the Freshman class, and Capt. Olmsted of one section. During the second term Prof. Georgeson

has instructed the fourth section of the same class. I have had five daily recitations throughout the session.

It has been my aim to lead the student into the habit of thoroughly analyzing every subject; to teach him to accept nothing as true in mathematical science, unless rigidly demonstrated, and to require him so to demonstrate all rules and principles before applying them to the solution of problems; to impress upon him the importance of this science in the practical affairs of life, and in the investigation of the laws of nature, as well as its value in strengthening and disciplining the intellectual powers, by carefully selected and original problems throughout the course, involving the application of its principles to the arts, industries and applied sciences of to-day.

During the session, in all the classes, I have, from time to time, supplemented the text by such explanations, lectures and problems as would serve to impress upon the mind of the student the important principles and applications of the subject. Through the liberality of the Honorable Board of Directors, the Department has been well equipped, being now supplied with a complete set of mathematical models, made by Schroeder in Germany, and imported for the college; a set of mathematical instruments and a slated globe; also, there has been added to the library a carefully selected collection of American, English, French and German works upon all branches of mathematics. Desiring to raise the Department to the high standard which importance warrants, I offered last fall, as a stimulus to exertion, a medal, to be awarded to that member of the Sophomore or Junior class who should submit the best paper upon a special examination held for that purpose. This examination was held the 10th inst. The good effects resulting from the offering of the medal have been apparent in the increased interest manifested by the students. Mr. Charles Graves, of the Sophomore class, was the successful contestant. I would also mention favorably Mr. George Pfeuffer, of the Junior class, his paper being the best in his class. Next year I shall offer the medal to that member of the Sophomore class who shall stand the best examination upon the mathematics of the Freshman and Sophomore courses. I herewith submit the examinations set for the different classes, and also the one for the medal. I take pleasure in reporting that, with few exceptions, the students in this Department have labored diligently, and the progress has been satisfactory. The Department and discipline of the classes have been excellent. I am, sir, very respectfully your obedient servant.

LOUIS L. McINNIS, Prof. Mathematics.

DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE.

COL. JNO. G. JAMES, PRESIDENT:

SIR—The report of the Department of English Language, English Literature and History, is herewith submitted. During the year every student in the college has been in this Department and received instruction from me, except two, who finished the course last year. Except during the first month, I have received no assistance in my department, and during that month I taught a class in another department. The following studies have been taught and finished: English Grammar, History of the United States, Universal History, English Literature and Logic. The Freshman and Sophomore classes have been drilled constantly in Composition and Elocution. In accordance with the advice of the Board of Directors, the students of the Freshman class have been drilled almost daily in regular spelling lessons, in addition to exercises in spelling and writing on the blackboard. The Freshman class included about three-fourths of all the students in the college, and two-thirds of them were very backward in this preparation for entering college. In consequence of this backwardness, they could not finish English Grammar in four months, since they had but five hours a week, a part of which time had to be devoted to Composition and Declamation and Spelling lessons. The class, therefore, during the last term, recited twice a week in English Grammar and Spelling, and twice a month each in Composition and Declamation. This left them only two recitations a week for four months to study the History of the United States. The class was divided into three sections, of from twenty to twenty-five students in each section.

The limited time allotted the Department, and the great backwardness of the students in all these studies, and the large number composing the class, rendered my work heavy, arduous and exhausting. Another difficulty in instructing this class existed in the difference of their attainments, some of them being one and two years behind others in their studies; and yet these could not be assorted and separated into classes according to their advancement, because of the clashing with other Departments. The class studied through the Grammar, with daily exercises on the blackboard by students or myself, and reviewed the entire work, each student writing the review, topics being assigned the class. In addition to the regular work, review and daily exercises near the close of the session. I summed

up, in several oral lectures at the blackboard, the entire work as a compact whole. The History of the United States had to be taught in thirty-two lessons. The students, therefore, were required to recite from fifteen to twenty pages at a time. This was too much, and extra labor devolved on me; but the students showing great interest in the study, it was a labor of love, and the class worked manfully to accomplish what was required of them. There were seventy students in this class. I prepared and delivered written lectures on the subject, embracing not only the topics of the text studied by the students, but such as touched the political, social, religious, commercial and constitutional history of the country.

It is not my plan to teach history by requiring my class to memorize a number of dry, disconnected, uninteresting facts, but to present it to the student as a picture of the march of the human race—advancing from darkness to light, from the fogs of antiquity to the civilization of the present age, pointing out the great lessons to be learned from the experience of six thousand years. Any nation or people would certainly be acting very unwisely to shut their eyes and march blindly into the pitfalls of anarchy and tyranny, and the whirlpools of revolution, when they could so easily fix them on the highway of experience pointed out by the historian, and shun the misfortunes, mistakes and faults of the ignorant past, and choose the way of success, honor and happiness. History, when properly studied and properly taught, is one of the most important elements in education. It is indispensable to the man of culture. It is the locomotive of the mind, the vehicle of thought, the life of learning. The history taught was not only finished by the class by recitations, but during the last ten weeks of the term written essays on all the most important periods of the history were prepared by each student weekly and read before the class. Under all the circumstances, I am able to say that I am well pleased.

Most of the students showed much interest in Declamation and Composition, and exhibited a generous and commendable emulation, both before the class and in public.

The Sophomore class in my department numbered during the session twenty-seven students. The work assigned them was to begin and finish Wilson's Outlines of History, to prepare and read an essay every two weeks on subjects selected by the Professor, to declaim before the class and receive instruction in Elocution every other week. For this work they had three hours a week, two devoted to History and one to Composition and Elocution. An outline of history, embracing all nations from the creation to

the present time, compressed into one volume, and taught in sixty-four lessons is a bare skeleton of the life of the human race, asd to put flesh, and color, and beauty to these dry bones so as to attract the interest and win the love of the student, is no easy task. The class recited the whole work, and reviewed it by written essays, thereby exercising their judgments as to the importance to be given to different events, and cultivating the art of composition, and insuring a close and accurate study of the subject. I made application for ancient maps to aid me in teaching by lecture, but failed to obtain them until towards the close of the second term. I purchased with my own means two very complete Historical Charts, and with their assistance and modern maps furnished me, delivered oral and written lectures throughout the entire session, sometimes taking a nation through its entire history, and in other lectures taking certain centuries, periods and eras, and grouping contemporary events of the different nations existing at the time. At the examination last February, the members of the class did great credit to themselves, and I was entirely satisfied with the result. In Composition and Declamation they have generally taken interest, and some of them have shown taste and talent.

The Junior class numbered twelve students, and recited to me three times a week. The first term they finished Johnston and Browne's English Literature, reviewed it, wrote about one dozen essays on topics embraced in the text selected by me, and stood an acceptable examination in February. In the second term, they finished Jevon's Logic and reviewed the work. The class were drilled in exercises appropriate to the text frequently on the black board, and the different systems and plans of several authors were developed and compared. Written lectures, carefully prepared, were delivered during the first term.

According to the course of study adopted, this class would have studied Rhetoric during this session, but that study was finished by them last year under me when they were in the Sophomore class. As Rhetoric is clearly related to Grammar, I will suggest that it would be better to assign it to the Sophomore class to follow that study, and carry the Universal History to the Junior class with English Literature.

There was but one student in the Senior class, and he finished the English studies under me last year. I, therefore, had no recitations in the studies of the senior year.

I keep in my recitation room for reference, in addition to the text books used by the students, a number of the best works on English Grammar, Language, Literature,

United States History, Universal History, Logic, Rhetoric, Elocution, etc., to illustrate to the classes the difference in treatment and arrangement of the subjects under consideration by the best authors, and the different views sometimes entertained by them. Throughout the year I have endeavored to arouse the ambition of the students in my department in all the various studies of English Language, Literature, History, Declamation and Composition, and have used all proper means suggested by my experience to make the work interesting, as well as useful and profitable. I think the students have appreciated my efforts in the performance of my work, and, generally, I am satisfied with them.

A man whose language and literature are English, can not be a respectable scholar unless he masters a course in English at least equal to that hitherto adopted in this college. Nothing less will enable him to speak and write the English language correctly—to become acquainted with the authors and the great works of the language; nothing less will enable him to understand the origin and development of the mother tongue—will furnish him with facts and lessons of the world's history—will make him a sound reasoner.

The work assigned to this department is receiving more attention—is being recognized as of greater importance, and is assuming larger proportions at the present time wherever the language is spoken, than at any previous period in its history. I would like to see the course made broad and thorough, for the time allotted to this department is not sufficient to enable a student, ignorant of the elements of English grammar, to become a finished scholar.

I shall, at the proper time, recommend some changes in books to be made in this department.

Very truly, your obedient servant

J. R. COLE,

Professor English Language and Literature.

Department of Modern Languages.

JOHN G. JAMES, President:

Sir—I have the honor to submit the following report of

the Department of Modern Languages for the session ending June 22d:

Since the reorganization of the college the Languages have been taught for the first time this year as optional branches, while every student was required to take either the Agricultural or Mechanical course. This arrangement of optional studies has, for various reasons, not given entire satisfaction. Students considered the Languages as studies which they were allowed to discontinue whenever they pleased; and were they crowded in any of the Departments within the courses, the optional studies were sure to suffer, as a deficiency in them would not, at the least, effect their class standing, nor their advancement from one class to another. Work among students, by all means, ought to be equally distributed, and those engaged in the study of a Language should be relieved of some other duty, as otherwise it would work a hardship on them at a great disadvantage compared with their fellow-students who pursue only either of the two courses.

All these difficulties could, in my consideration, be avoided easily by making the Languages elective within the courses—that is, by requiring of every student coming here to take one Language, whether Modern or Classic to be left entirely to his discussion. There is not a scientific nor technical school in either Europe or the United States where German and French do not form part of the regular course, and even the Agricultural College of Michigan, so frequently cited as the model college, requires two years' instruction in French. Like the French, the German language is of vast importance to every scientific man, not to speak of the great advantage it must be in the practical pursuits of life in a State which, according to the last census, has less than 200,000 citizens of German descent within her borders; and even a knowledge of the Spanish in view of the near opening of a trade channel to our neighboring Republic, can be of incalculable benefit to our practical farmer and mechanic.

The total number of students in the Department has been this year forty-two, distributed into the different classes as follows: Sophomore, German, 17; Junior, German, 13; Sophomore, Spanish, 11; Sophomore, French, 1.

The class in French, as you have observed, consisted of but one student, and as the late Board has not passed any resolution concerning the number of students justifying the formation of classes in the Departments of Languages, I did not feel at liberty to refuse this young gentleman. I gave him a full course of instruction, and I am glad to say that I have been amply rewarded for the time spent with him by

his unusually rapid progress. Having completed the course as laid down in the catalogue for the Sophomore class, Mr. Graves read DeSaint Pierre's 'Paul et Virginie,' and different selected pieces of poetry, and began, also, the study of Maurice Poitevin's 'Grammaire Francaise.'

The Sophomore class in Spanish completed the practical part of De Torno's Grammar, and read about half through Morales' Spanish Reader, while the Sophomore German finished the practical part of Donai's Grammar, translated the first sixty exercises of Stahl's Versions, and read 102 pages in Adler's Progressive Reader. Both classes ought to be familiar with the declensions of nouns and the conjugation of regular, and a large number of irregular, verbs which, with their moods, tenses, persons, numbers and inflections, are the vital elements of discourse.

The Junior class in German translated the whole of Stahl's Versions, completed the short systematic course of Campbell's Grammar, and were thoroughly instructed in Syntax. Eichendorff's 'Aus dem Leben eines Taugenichts' was read and translated in the class-room without any aid outside of the dictionary, and likewise a series of 'Reisebriefe aus America,' by Fr. v. Bodenstedt, in 'Ueber Land und Meer,' one of the best literary journals of Germany, filed in the reading room.

The aim of this Department is to enable the graduates to understand the Modern Languages when spoken, and, to a certain extent, to speak them, to avail themselves of the standard scientific and technical works in German and French, and to give such practical acquaintance with literature, literary history and philology, as may be best calculated to engender that mental culture which makes the truly educated man.

The method of teaching in this Department is set forth in the following outlines. While Grammar contributes within certain limits to correct speaking and writing, it must not be inferred that it teaches to speak and write; it affords no assistance whatever in reading, and does not explain the meaning of phrases or words, which is the only difficulty encountered in learning to read a foreign language. The translation which interprets the unknown text, not the grammatical condition of the words, must be the first, the only object for consideration in the Sophomore classes. Students, therefore, begin to read and write before they attempt the study of rules, as it is a well established fact that they might be able to repeat a grammar from beginning to end without being capable of understanding or speaking one sentence in the language. After three months reading and translating sentences, readers are used treating of sul-

jects familiar to the students, and written in an easy style so as to avoid encountering at the same time the difficulty of the subject and that of the language. The fables, anecdotes, tales, and historical sketches thus read will not alone be of general interest, especially when they relate to the nations whose languages are studied, but also familiarize the students with the terms and phraseology of ordinary conversation. The elements of discourse by the daily practice of reading will remain in the memory without efforts, and the students will unconsciously store in their minds a number of grammatical rules, which in the second year they learn to combine to a complete system by means of the study of the theoretical part of a grammar. As Juniors, the students are required to put the rules in practice by numerous applications, taking as models the example which generally accompany them. They also have to devote a large portion of their time to reading and translating of some classical work, as voluminous reading is the surest road to a thorough knowledge of any language. In the third year, or Senior class, the students will be carried in German and French through a short course of scientific reading, as the text-books in common use in this country are, without doubt, inadequate to the wants of the students of science who, though able to read and speak the languages on common topics, are apt to find the greatest difficulty in reading scientific journals and in consulting such foreign books as their professors may indicate as sources of information on the problems in which they are engaged. The classics will be read to a still larger extent, but without any complete translations, as the students with a considerable portion of the vocabulary and idiomatic phraseology at their command, will find it far easier to follow the thoughts of an author directly than to translate. Besides, a number of lectures will be delivered to the Senior classes in the languages studied on the origin, progress and decay of languages and literature, in which the principal epochs of the world's history in their bearings on literature and civilization are to be discussed. The written exercises, finally, will consist in compositions instead of translations, and while in the previous classes the students were allowed to answer in English any of the questions put by the professor in the native idiom, in the Senior classes no other language will be used in the class-room but the one under study.

In conclusion, allow me, Sir, to thank you for the liberality with which some of the necessary wants of this Department were supplied. The two large wall-maps of Germany and France, and the small set of very valuable books of reference, together with the German and French

literary papers subscribed for the reading-room, were, and will be, constant sources of investigation for both professor and student. Respectfully,

Your obedient servant,

G. GARTNER,

Prof. of Modern Languages.

Department of Ancient Languages.

PRESIDENT J. G. JAMES:

SIR—I have the honor to present, through you, to the Board the following report of the Department of Ancient Languages during the term just closed.

The course pursued has been mainly that laid down in the Catalogue, with such changes as were found necessary, and which will be mentioned in the order of their occurrence.

In Latin—the Freshman class has studied Gildersleeve's Grammar, Gildersleeve's Exercises and Reader, devoting their attention mainly during the second term to the Reader, with regular practice in the Exercises and Syntax.

The Sophomore class has read portions of Cæsar, with three books of Virgil's Æneid, and three orations of Cicero, with regular practice, also, in Exercises and Syntax. It was my desire to accomplish more reading in this class, but the number of recitations under the schedule adopted at the February term was diminished. What has been read was done without review, and the class has, I am glad to say, in the main, accomplished its work very well.

The Junior class, under the old course of last year, had read portions of the Junior course, and hence their work has extended into the Senior course, as now constituted. They have read portions of Horace, three books of Livy, portions of the Annals of Tacitus, and of the Agricola, with weekly practice in rendering English into Latin.

The number of students in this Department has been 50—2 in the Junior, 11 in the Sophomore, and 37 in the Freshman class. This does not comprise all who would have entered, had circumstances permitted. Numbers, to my own knowledge, were prevented from the impossibility of attending the class—the hour conflicting with their classes in the regular course. Others, again, were deterred from the fear that they would be unable to carry on the study in connection with the regular course. The same difficulty has kept many students from attempting the Greek course, though several who were in that department last year were anxious to continue it. The number study-

ing the Greek, however, is always small relatively to the number taking Latin.

These are some of the difficulties resulting from the *optional character* given to the Language courses last year. This arrangement was entered into by the Board, as I understand, not from any desire to thrust these studies into a corner, but from a natural wish to give prominence to those branches which the law has made "leading objects." Experience has shown that the plan does not work well. The student himself does not keep up that interest he should, when he finds these courses are not essential to his graduation. Impressed by these considerations, the Faculty has presented to the Board a scheme which, if adopted, obviates the difficulties I have mentioned. By making the Languages *elective* within the course, all the advantages of the optional system are gained, and its difficulties removed—as set forth in the paper presenting the scheme. The law of Congress plainly requires these branches to be taught, and the means to give them the greatest efficiency should be adopted, so long as these do not interfere with the leading objects of the school, which we all recognize and desire to see promoted.

The study of Language is looked upon by some as a mere embellishment. Without discussing the subject here, I desire to say that if that is all that can be claimed for the study, it does not deserve a place in any course of instruction. In my opinion, a study that is not *practical* in its results, does not deserve the name. Language, properly taught, does develop the faculties in a way that few other studies do. This has constituted, and always will constitute, its claims to a place in any wise plan of instruction; and hence the wisdom of the Act of Congress in providing against the exclusion of "Scientific and Classical studies" from the Agricultural and Mechanical Colleges.

Respectfully submitted,

C. P. ESTILL,
Professor Ancient Languages.

MISCELLANEOUS.

DIPLOMAS AND CERTIFICATES.

The Diploma of the College will be conferred upon all students who complete either of the prescribed four years' courses of study, and pass satisfactory examinations on all the branches embraced therein. Each candidate for graduation is required to submit to the approval of the Faculty an essay, composed by himself, on some literary or scientific subject, which essay must be read by the author on Commencement day, if so ordered.

To every student who completes satisfactorily any of the optional studies—French, German, Spanish, Latin, Greek—a special diploma on that subject will be granted.

Each student receiving a Diploma will be required to pay $5 00 therefor. No academic honor, however, shall be conferred on any student who shall prove deficient in conduct for the session.

MARKS AND EXAMINATIONS.

All recitations throughout the session are graded and recorded. The maximum for the day, week, month, quarter, term and session is 10, which indicates perfect recitations; imperfect recitations are expressed in decimal fractions of the maximum.

Two general examinations of each class are held during the session, which every student is required to attend. The first, called the Intermediate, is held in January, and embraces the subjects of instruction in the first term. The

second, called the Final, is held in June, and embraces the subjects taught during the whole session. These examinations are mainly in writing, and the questions propounded have numerical values attached.

A monthly report is mailed to the parents or guardian of each student, showing his class standing, demerits and health.

Organization and Government.

The students are organized into a battalion of two or more companies, under the immediate command of the Commandant. The commissioned and non-commissioned officers are students, who are promoted to those positions for their soldierly qualities, due regard being had to their length of service.

The uniform is of cadet gray, and is cheap, neat and serviceable. No other dress than that which is prescribed shall be worn by students after they have received their uniform.

As this institution is in no sense an asylum for vicious, depraved, or unmanageable boys, no such persons will ever be admitted, knowingly, under any conditions; and a student who shows himself insensible to the obligations of honor, good morals and self-respect, is at once sent home.

Manly sports and exercises, when not in conflict with studies and duties, are properly encouraged.

Students receive the admonition and counsel of the President before being subjected to any penalty, except in cases of flagrant offenses. Those who are habitually neglectful of their duties, or who do not regularly attend their classes, will be required to withdraw from the College.

No student is allowed to leave the College during the session without the permission of the President, on application through the Commandant.

The strictest attention to study and the most exact punctuality in attendance on recitations, and other duties, will be made the *condition* of every student's continuance at the College; and any student who without authority absents

himself from recitation or any other duty, deserts his class, or refuses to attend when warned, shall be dismissed, or less severely punished, at the discretion of the Faculty.

Students are prohibited, under penalty of dismission, from having in their possession ammunition, weapons or arms not issued for the performance of military duty; nor shall these be retained loaded in quarters under any pretext.

Students are prohibited from entering into combinations under whatever pretext. One who shall begin, excite, cause or join in any boisterous or riotous conduct, or become a party to any agreement to avoid or violate any regulation, to hold no intercourse with a comrade, or to do any act to the prejudice of good order and military discipline, shall be dismissed.

No student shall have in his possession, or play at cards, or games of chance, engage in a raffle, or in any manner wager money or other things, on penalty of dismission.

Permission to attend private parties, or places of public amusement, will not be granted during the term.

No cadet can be granted a leave of absence during a term of twenty weeks, without an urgent necessity.

A student who shall drink, or bring, or cause to be brought within the cadet's limits, or have in his room, or otherwise in his possession, any fermented or intoxicating liquor, or fruits or viands preserved in intoxicating liquor, shall be dismissed.

A student who shall cut, mark, or otherwise injure or deface the buildings, furniture, or appurtenances; the trees, shrubbery, green-sward, grounds, fences, stables, or out-houses; or who shall lose, injure, destroy, or improperly dispose of the arms, accoutrements, or other property of the College, shall make good all damage, and be dismissed or otherwise punished according to the nature of the offense.

To each recorded delinquency a number of from one to ten proportional to the degree of the offense in a moral and military view, is assigned to express demerit.

If any student receives 150 demerits for the whole or

any part of a half-year, or 250 for a greater period, he shall be declared deficient and dismissed.

Religious and Moral Culture.

Prayers are held every morning in the Chapel, which the students are required to attend. Every Sunday afternoon there is preaching in the Chapel by one of the ministers from Bryan, and all students are expected to be present. And the Faculty will try with all the means in their power to protect and develop the moral character of those committed to their charge. Classes for Sunday Bible instruction will be formed, which students are invited to join.

Societies.

There are two literary societies in the College, the Austin and the Calliopean. They meet weekly in their respective halls for practice in debate, literary composition and declamation. The Natural Science Society meets weekly for the discussion of scientific subjects.

Location.

The College is situated on a tract of land of 2416 acres belonging to the State, five miles south of the town of Bryan. The Houston and Texas Central Railway passes through the grounds, and has a depot, College Station, within a quarter of a mile of the College. Daily passenger trains make close connection with the entire system of railroads of the State, thus rendering the College accessible from every section.

The postoffice, as well as depot, for the College is *College Station* and *not Bryan.*

Library and Reading Room.

Through the liberality of the Legislature, a valuable

Library and Reading Room have been provided for the use of the students, and large additions will be annually made.

The Library now comprises standard works of History, Biography, Agriculture, Mechanics, Engineering, Mathematics, Natural Sciences, Law and Political Economy, Mental and Moral Philosophy, Poetry, General Literature, and Reference.

Among the periodicals kept on file in the Reading Room are:

ENGLISH.

London Times. Quarterly Journal of Pure and Applied Mathematics. Canadian Monthly. Engineering. Chemical News. Agricultural Gazette. Nature.

AMERICAN.

American Journal of Science and Art. Popular Science Monthly. United Service Magazine. Scribner's Monthly. Harper's Monthly. Lippincott's Monthly. Sunday Magazine. Southern Historical Society Papers. Rural New Yorker. Prairie Farmer. Massachusetts Ploughman. Industrialist. Farmer's Review. Scientific American. The Nation. Puck. Harper's Weekly. Philadelphia Times. New York Herald. Louisville Courier-Journal. Southern Churchman. Christian Observer. Religious Herald. Christian Advocate

Gifts of books and magazines will be thankfully received. Back numbers of literary and scientific periodicals will be especially useful in completing the files already begun.

Admission of Students.

Applicants for admission must be not less than 16 years of age: must have a fair knowledge of the elementary English branches; must be free from any disease, deformity or permanent injury, which would render them unfit for the prescribed duties; and must present satisfactory testimonials of good, moral character.

Students supply their own towels, pillow-cases, sheets, blankets, clothes-bag, comb and brush. All articles of

clothing and bedding should be plainly marked in indelible ink with the owner's name.

Sixth Annual Session

Commences on October 1, 1881, and ends on the fourth Wednesday in June, 1882. Students can enter at any time, and will be charged from date of entrance only; but it will be greatly to their advantage to report at the beginning of the session.

Expenses.

All students are admitted free of charge for tuition and quarters, but each must pay in advance an annual matriculation fee of $10.00.

Board, fuel, washing and lights for the academic year, $120.00.

Payments Due Quarterly in Advance.

Matriculation Fee	$10 00
First Quarter	30 00
Second Quarter	30 00
Third Quarter	30 00
Fourth Quarter	30 00
Total College charges for the year	$130 00

Only one uniform—an undress suit of cadet gray—is required, which costs $13.00.

Text-books can be purchased at the College at regular retail rates.

There are no extra charges of any kind, but wilful damage to public property will be assessed against students.

No part of the matriculation fee will be refunded students who leave or are dismissed before the session ends.

All remittances should be made directly to the President.

No fee for medical attendance is charged by the college, but students who are sick will pay the attending physician his reasonable bills for services rendered. Sick quarters and nursing will be supplied, as heretofore, free.

Industrial Department.

The duties of this department are, to a great extent, planned with reference to illustrating and applying the scientific principles taught in the class-room. All *instructive* labor is regarded as compensated by the instruction given and the skill acquired. Manual labor is not compulsory, but students who desire to help defray their expenses by work can do so by taking part in the *uninstructive* labor, such as ordinary farm operations, repairing, carpentering, painting, janitor's duties, and stock management, at fair wages. This can be done at extra hours and on Saturdays without interference with regular studies and duties.

Instructive and uninstructive duties will be supplied in:

1. Agriculture—general farm operations.
2. Horticulture—garden, vineyard, and fruit culture.
3. Stock and dairy management.
4. Mechanics—carpentering, fencing, painting, etc.

Four thousand dollars has just been expended by the Board of Directors for the equipment of the mechanical department with the necessary tools, machinery, engine and materials. The shops in which systematic practical instruction is to be given are:

1. Carpenter shop.
2. Vise shop.
3. Forge shop.
4. Steam, Wood and Metal Working Machinery.

The Directors have fixed the maximum rate of compensation per hour in the Agricultural Department at 15 cents, in the Mechanical, 20 cents.

The object is to assist worthy students in every way possible, but the College can not guarantee to any one student sufficient labor to meet *all* his expenses, as labor can be furnished only as long as the interests of the institution permit it. A small amount of labor is annually expected from each student, to assist the Professor in the ornamentation and improvement of the grounds.

Agricultural students are encouraged to use their spare time in farm work at fair wages, but will be paid for *quantity* and *quality* of work, not for *time* only. All paid labor will be given by preference to those students needing assistance.