

THE SPECULUM.

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Drill, Droll Drill.

EXTRACT FROM CLASS POEM BY M. G. KAINS.

A freshman to the *drill ground* came to learn the various *paces*;

To *march*, to *turn*, *advance* and *halt*, and make the sundry *faces*.

"Fall in," a sergeant calls so bold, but freshie stands in doubt,

The sergeant fumes and roars at him, and they have a *falling out*.

"Come freshman take your proper place, *according to your height*,

And stop that gawking round the grounds when I command, *eyes right*."

"I didn't know what '*fall in*' means," the freshman then replied.

"Why don't you use a clearer term, with meaning not so wide."

"Look here," the raging sergeant cries, "Your jabber now must cease,

You're here to learn the *art of war*; I'll teach you piece by piece,

When I command you must obey and act as if you're mute

For if you don't I'll settle you by reporting you to '*Lieut.*'"

Now in the lines the freshman stands, he finds the *drill is rank*.

For though he's clothed he *gets his dress*, by looking to his *flank*.

From *front to rear*, from *left to right*, he *marches* till he's sore,

Quick step, *back step*, *short step*, *side step*, and miss steps by the score.

With *exercise*, and *wheel* and *march*, his carcass aches all over,

Like Hood, he thinks, "The field of Mars is not a field of clover."

But later on this little man, whose cognomen was Brown

Said good bye to the "*awkward squad*," where he had been a clown,

For being handy with his legs and with his *arms* the same,

Although no gentleman was he, a *sar-gent* he became. Now Brown went down to Lansing town for there he had a spark.

The spark became a flame, and he couldn't keep it dark

His love was of a martial turn and used to "wars alarms."

So when he told undying love, she straight was "up in arms."

She was so gushing after that and lavish with embraces

That Brown was willing every night to be put through his paces,

But when it came to testing him with *guns*, 'twas her suggestion.

He said, "I don't know how to *aim*, but I can 'pop the question.'"

"Oh fie," said she, "to *fire* at me so *rank* a pun, 'tis strange

You can't control your wit when you come within my *range*."

Then he perceived, 'twas now too late, that he had been a fool.

He lost his temper and got hot, instead of keeping cool,

While she to plague him worse and worse was playful as a kitten

And said she'd take his martial gloves and let him have "the mitten."

But after all it turned out well, the *engagement* wasn't broken.

They settled down to bill and coo, and *pardon* harsh words spoken,

And soon they met at the altar rail to take the vows so solemn.

The papers gave a long account. It occupied a *column*.

Some Aspects of Robert Burns.

HERBERT M. HOWE.

In studying the life of Burns we are struck with several leading characteristics of his genius, prominent among them being his boundless love of nature and intense sympathy with all her creatures.

The following from the after-dedication of Burns' poems reveals something of his soul-inspiring song: "The poetic genius of my country found me as the prophetic bard, Elijah, did Elisha—at the plough, and threw her inspiring mantle over me. She bade me sing the loves, the joys, the rural scenes and pleasures of my native tongue: I tuned my wild,

artless notes as she inspired." So we are not surprised that there is something about his poems that smells of green fields and mountains, nor that sterling worth pervades all his writings.

Scottish life is not seen by him in any romantic illusion; the portraits he draws are of natural and real life, and natural men and women, and the world he depicts is the world in which he was a plough-boy, an exciseman, a poet.

Burns takes great delight in nature, especially in her more gloomy aspects; he loves the solitude of the forest, and the rush and roar of the tempest is sweetest melody in his ears. Yet, he never describes nature simply for the sake of description. Ardent as was his love for natural things, these things were made secondary to the great central human interest; and the paramount doctrine he teaches is man's inherent dignity, regardless of station. He deals with the actual circumstances of his life, however commonplace or trivial they may seem.

Of a nature sympathetic and kind, Burns' poems are intensely human. He even bestows sympathy on "Auld Nickie-ben," as well as upon the mountain daisy turned up by his plough; and, his poet-heart ever alive to the misfortunes of the down-trodden, whether man or animal or plant, goes out in pity to the "wee, sleekit, cow'rin, im'rous beastie," his "poor, earth-born companion an' fellow-mortal"! And how characteristic it is of the noble, humane nature that in the "Winter Night," himself overburdened with misery, he thinks with deepest pity of the sheep and cattle and the "Ilk happing bird," unhoused in the wintery blast:

I thought me on the ourie cattle,
Or silly sheep, wha bide this brattle
O' winter war.
And thro' the drift, deep-lairing, sprattle,
Beneath a scar.

Ilk happing bird, wee, helpless thing!
That, in the merry monthis o' spring,
Delighted me to hear thre sing,
What comes o' thee?
Whare wilt thou cow'r thy chittering win'
An' close thy e'e?

Of this poem Carlyle says, "This is worth several homilies on Mercy; for it is the voice of Mercy herself."

As a conversationalist Burns was brilliant, and he might justly be proud of his pre-eminence in this respect. It has been said that his best work was what he said in talk. That we have so little record of this best work, we have only his reporters to blame.

Probably the most striking incident in Burns' life was his visit to Edinburgh. Ever since boyhood, Burns, a son of toil, had battled with poor soil and bad seasons, but on this account he was by no means unhappy; on the contrary, his youthful days appear to have been uniformly gay and free from care. His education and pleasures were those of a Scotch countryman. Now he suddenly came among the wisest and loveliest of Edinburgh. There he was given such a reception by the lettered nobility as would have turned the head of a man less great. But in the midst of all the honors and blandishments that were showered upon him, he bore himself with a cool and quiet dignity and lack of self-consciousness, and affectation that is as surprising as it is admirable, and shows again the greatness of his mind. And when the time came he returned to the privacy of country life with equal dignity.

We deplore certain elements in the character and in the poems of Burns. Throughout his entire life and in nearly all his writings there may be traced a false note which makes discord of the otherwise harmonious whole. Strive as we may to conceal it or cover it up with apologies and excuses, it will make itself known; for he has told us himself all the good and bad that is in his nature, and we are obliged to acknowledge his defects while we laud his virtues. He had a wrong idea of life. Believing pleasure to be the chief end attainable, he pursued it with ceaseless desire and vigor, and like every other man who ever pursued this phantom—failed, not only in finding pleasure, but in success in life. It was this that filled his life with bitterness and

remorse, and made shipwreck of his manhood. And it seems strange that one of Burns' peculiarly keen insight into human nature should continually blame fate, for what?—the fruits of his own folly.

Yet, while his life was discordant, what wonderful music even in his discords, music that touches the hearts of people in all the walks and conditions of life. Especially to the wretched this music comes with solace and comfort such as no other poet has ever offered. His songs are the most genuine music of the heart since Shakespeare. In them lies Burns' strength, and to a great extent his influence as an author. He runs the whole scale of human experience and touches every mood of the human heart. Think of the infinite variety of his subjects; he sings with tenderness, vehemence, sorrow and joy; and his tenderness is the most tender, his joy the most joyous, his mirth the merriest, and his vehemence the most furious. From the fiery sentiments of that greatest of war odes, "Scots wha hae wi' Wallace bled", a song to be remembered as long as Scotland has patriots, to the simple and healthful tone of "John Anderson, my Jo", the kindness of "Auld Lang Syne", and the inexpressible sadness for "Mary in Heaven", what scope, what depth of feeling! Where in the language can we find a poem so expressive of the true spirit of democracy and manly independence as "A man's a man for a' that"?

As a song writer Burns has no equal, and it is difficult to find anyone worthy even of being called second to him. Thomas Aird, himself a poet, has told us in a few words of the worth of Burns in this respect. He says, "those old Scottish melodies, sweet and strong though they were, strong and sweet, were, all the more for their strength and sweetness, a moral plague from the indecent words to which many of them had long been set. How was the plague to be stayed? All the preachers in the land could not divorce the grossness from the music. The only way was to put something bet-

ter in its stead; this inestimable something better Burns gave us." What higher tribute could be paid to any poet, especially if we believe in Fletcher's aphorism, "Let me make the songs of a people, and you may make its laws"?

As a poet Burns was successful; as a man he was a pathetic failure. And, while we admire his genius, it is an admiration accompanied with pity for his weaknesses. We seek in vain for someone or something on which to lay the blame for this failure; the blame lies almost wholly within himself. True, he was born poor, and remained poor all his life; but others like him have been poor without suffering such serious consequences. He was obliged to toil with his hands all his days, but that is not the hardest lot conceivable. His father, good and wise man that he was, had known poverty in its most distressing conditions, yet he struggled manfully to overcome it, and died prevailing. Many poets before and since Burns' time have striven against poverty and worse evils and have conquered. Instead of poverty and suffering being a drawback to his work as a poet, it is a question if it was not a positive advantage in that it gave him a keener sympathy with the unfortunate, a deeper appreciation of the woes of mankind, and a clearer recognition of the tie of brotherhood. As he himself expresses it "the canary-bird sings sweeter the longer it has been trained in a darkened cage."

Of the worse elements in Burns' character enough has been said,—perhaps too much, for we are liable to spend more time in criticising his faults than in studying his virtues. Consider him in the light of the time in which he lived, and in his relation to human progress.

Deep down in our hearts we love the Ayrshire poet; for in him we find sympathy in every experience in life. Unlike Milton, his is not the broad and placid river; but the turbulent mountain stream, hurrying onward in winding paths, over rocks and precipices, through dark caverns and gloomy woods, dancing again in the sunlight; ever sparkling, murmuring,

singing, ever refreshing the heart of the weary traveler who stoops to drink its cool and healthful waters.

"Then gently scan your brother man,
Still gentler sister woman;
Tho' they may gang a kennin wrang,
To step aside is human;
One point must still be greatly dark,
The moving *why* they do it;
And just as lamely can ye mark,
How far perhaps they rue it."

Economic Entomology.

E. DWIGHT SANDERSON, HESPERIAN SOCIETY.

"Hello there! Get many fish?" This is a question that I—and I presume almost all insect collectors—have heard so many times while out on a collecting trip with the net, that I have now come to expect it and am often prepared to suggest that there is no water within several miles, in which I could procure such game.

Such a senseless query clearly shows the idea that many of our agriculturists have of one of their best friends—the science of entomology. The amount of their knowledge upon the subject seems to be much akin to that of a student beginning the study of psychology.

Year after year, we have heard the cry that farming does not pay, and during those same years, the farmers have seen a large part or all of their crops destroyed by insects. Obviously, we may say that the so-called hard times are in many instances directly traceable, in a greater or less degree, to the lack of knowledge on the part of the farmer concerning the structure and habits of his natural enemies, their relative destructiveness, and the best means of destroying them. How quickly will many men shoot a crow or hawk, while it can be easily shown that neither can compare in destructiveness with the most common insect pests, but on the contrary do not a little good.

The question then confronts us as to how much injury these insect pests actually do and whether scientific study of entomology together with its economic

application is of sufficient value in subduing them to warrant its cost.

To those who are acquainted with the work that has already been done, such a question seems almost preposterous; but there are many, who, though they may have studied the science, are not fully impressed with its economic value, while a greater number know nothing of either.

Some account, therefore, of the losses sustained, the work done to avert such, and that which it is expedient to prosecute, may not seem uncalled for.

The losses occasioned by insect plagues form an important item in the earliest records of the race and from that time to this they have never ceased to be a notorious nuisance. Yet like many of the sciences, which we are now coming to recognize as among the most important, entomology is comparatively new and still in its formative period, while economic work in this line is of quite recent date. Thus it is impossible to cite any but the most recent investigations and statistics.

In 1864, Dr. Shirmer estimated the loss on the corn and grain crops of Missouri by the chinch bug was \$73,000,000, and in 1887 among nine states infested, Mr. Howard put the loss at \$60,000,000. In 1891 the loss of one farmer in Kansas on 100 acres of alfalfa by grasshoppers was as much as \$2,000, and he was only one of many. The damage done by the gypsy moth in Massachusetts, which occasioned appropriations of about \$350,000 by that state for its extermination, need not be repeated.

One of the most serious pests of recent date is that of the cottonball weevil in Texas. This importation from Mexico has spread over one-sixth of the cotton producing portion of the state and if its ravages be not quickly checked, the damage will be inestimable. During the year 1894 the loss was from 25% to 90% in the infected regions. This meant 15% of the whole crop of the state, or in round figures 3% of the United States, or 2% of the world's product, with a farm valuation of over \$8,000,000. Such figures

seem almost incredible, but can be readily calculated from the report of Mr. Townsend, a field agent appointed by the Division of Entomology, of the Department of Agriculture, to investigate the matter.

With such facts in mind it is not to be wondered that Prof. Jas. Fletcher, Dominion entomologist of Canada, in 1891 estimated that out of an agricultural product of \$3,800,000,000, the United States annually lost \$380,000,000 by insect pests. Such a loss seems almost beyond belief, but is in itself a conclusive proof that whatever the cost of study and experiment may be that it cannot but more than pay for itself. Here is a sum sufficient to carry on the administration of all branches of the national government. By no means all, nor possibly the greater part of this could be saved by the greatest care. But if only one fifth of this could be prevented, there would be a saving sufficient to pay for the education of every college student in the land.

That much can be done towards such a saving has been repeatedly demonstrated. The gypsy moth has been almost exterminated in Massachusetts, and the advice given and work done by entomologists in abating the ravages of grasshoppers in North Dakota and Minnesota in 1891, saved the farmers of those states \$400,000. Through the work of the entomologist at the Virginia experiment station, the potato growers around Norfolk now do for \$40 or \$50 what they formerly paid \$500 or \$600 for. Another instance is recorded in Indiana, where by a simple rotation of crops, a pest was starved out that the year before occasioned a loss of \$10,000 on the corn then grown. It has been estimated by Prof. Osborn, that the small leafhoppers destroy enough grass on a two acre plot to feed one head of stock a year, and he found that by use of a hopper-dozer he could obtain a crop 34% better on one of two similar plots, the other of which was not treated.

Besides the above mentioned methods, the one which is now most in use is that of spraying. Though to spray potatoes

with Paris green for the potato beetle, and fruit trees for the coddling moth, is now a matter-of-course affair on most farms, yet many can remember the day when the operation was looked upon with suspicion. Much time and study have been spent in the concoction of effective insecticides and the invention of suitable spraying apparatus, and the result has been an object lesson to all.

But to apply these effectively, the structure and habit of the foe must be known. For instance, the kind of insecticide used depends entirely upon whether the insect has biting or sucking mouth parts or a soft and easily irritated skin; if the former, a poison must be used to enter the mouth, while the latter may be easily killed by an irritant such as kerosene emulsion.

Another method of extermination which is now attracting much attention from entomologists is that of encouraging such animals as are parasitic on a pest. One of the greatest triumphs of entomology has been the introduction of species of Australian Ladybirds into California and the riddance by them of the San Jose or Pernicious Scale. This scale was probably imported from Japan, and was quickly transported throughout the west and finally to the east. It has been the subject of rigorous laws, imposing heavy fines for the selling of produce infected, in most of the Pacific coast states and will probably be made so in the east. Many other valuable natural allies have thus been made use of, and by a proper study and encouragement of such parasites a great deal can be accomplished.

It has been mentioned that the San Jose scale was imported from Japan to California and thence east. This opens to us the discussion of the spread, and its prevention, of such dangerous foreigners. Out of 140 scales in this country 40 have been imported, and these are the more dangerous because their parasites have not accompanied them. Such being the case, a quarantine at the principal ports will readily be seen to be of great value. Such has been established on produce

arriving in California, but not, however, from there, and will probably be soon inaugurated by legislation in the east. An inspection of inter-state commerce is impracticable, but rigorous legislation upon the care and prevention of these pests is a matter of a not far distant future.

That the annual loss may be much lessened seems to be clear; as ever in all progress and reform the method is education and legislation. By our agricultural colleges, farmer's institutes and home reading circles, the former can be accomplished, and by the agriculturists insisting upon their being represented by progressive and public spirited men, the latter will soon come.

Emil Smith.

All the upper classmen and faculty residents of the college were very much surprised and pained to hear of the sudden death of Emil Smith, '93. Emil Smith of whom we all expected so much. It had always seemed impossible that the grim destroyer could overcome a man with so much grit, stamina and endurance.

Emil Smith was taken out of the Detroit schools by his father at an early age to learn the trade of machinest. Soon after he left school he went to President Gorton then superintendent of Detroit schools and said "I believe that to succeed one must have an education I have no money but I believe that by hard work I can get one." His life shows that he meant what he said. Upon recommendation of President Gorton he went to Senator McMillian, stated his case, received a draft for \$100 and came to M. A. C. All his earthly goods came to the college in a box, that box was for him a study table. He obtained employment as night fireman of the boiler house. He lived, studied and worked hard and made an excellent record apparently without sleep. In two and one-half years he had completed the four year's course, receiving his diploma with

the class of '93. He still had \$75 of the original \$100. Again he went to Senator McMillian. Next to Cornell University, where he took the hardest engineering course and graduated in one year, '94, although the authorities had told him it could not be done in less than two years. After graduation he did some engineering work for the New York Central Railroad, and from there went to Pittsburg to work for the Westinghouse Electric Co., having obtained his position through Nikola Tesla. His aims and hopes were the brightest. All who knew him at M. A. C. feel that they have lost a friend of exceptional physical, mental and moral attainments and the world has lost a brilliant young man who would have made himself useful to all mankind.

P. B. W.

Orlando Augustine Turner.

The alumni will learn with surprise and sorrow of the death of Orlando A. Turner of the class of '90 at Leipsic, O., where he had been in the employ of Churchill & Co., grain and seed commissioners. Details are meagre, but it appears that an attack of typhoid fever ended in his death the last week of September. The funeral was held at the home of his parents in Grand Rapids, Mich.

Mr. Turner was born Nov. 8, 1868, and up to the time of entering college had spent the most of his life in and about the city of Grand Rapids. He prepared himself for college in the district, ward and high schools, and was graduated from the Grand Rapids high school in 1887, entering the agricultural course here the same year. Faithfulness and perseverance enabled him to complete the work in three years, and he graduated in August, 1890. The many offices of trust and honor with which he was intrusted are a sufficient indication of his reputation for integrity and ability among his fellow students, and these sterling qualities so necessary for a successful business life were procuring for him a

rapid advance in the business world.

Mr. Turner chose always to be simple, unobtrusive and quiet; for this reason few knew him intimately, though his uniform good humor and uprightness could not fail to secure the respect of all. He was a steadfast friend, a lovable companion; he was generous, truthful, noble. What a privilege, indeed, to know him and to feel his influence.

W. B. JR.

SCIENTIFIC.

A Plan to Utilize Electricity.

At a meeting of the Natural History Society September 27, Prof. Woodworth talked on the latest plan of utilizing electricity, or the supplementing of electrical power for methods commonly employed among agriculturists in the destruction of weeds.

The knowledge of the destructiveness of lightning to plant life, said the professor, has suggested to electric road companies the idea of suppressing the growth of weeds upon the tracks by means of electricity, thus doing away with much of the expense and labor necessitated by the present means employed. As a result of the idea, a rod to which is fastened suspended wires at short intervals has been devised. This attached to the rear of the car, bringing the ends of the wires in close proximity with the weeds, an electrical current passed through a transformer, thence through the rod and wires, and the weeds are killed to the roots as the current passes through them. By means of the transformer the voltage may easily be raised to a pressure sufficient to send an electric spark a distance of three or four inches.

This practical application, for such it proved, has suggested to the professor the idea of destroying weeds on the farm in a somewhat similar way.

A man with a wheel-barrow equipped with a couple of cells, a transformer and an attachment of suspended wires, could quickly and easily annihilate a patch of

Canada thistles or other obnoxious weeds. If one desired to carry out the work upon a larger scale, heavier apparatus might be loaded upon a wagon and conveyed wherever desired. Prof. Woodworth will endeavor to have the practicability of the latter suggestion tested upon the weeds and grass encroaching upon the drives of the campus.

Thesis, The Chlorine Content of Water.*

BY THORN SMITH.

That contaminated water is a means of conveying disease of the most loathsome and malignant form is, in the light of modern science a fact not to be disputed. Bacteriological investigation has shown beyond doubt that the specific microorganisms of our common diseases, find contaminated water a culture ground. The minuteness of the organism prevents the acceptance of the statement by the uneducated and it is to a great extent they who are most afflicted with the contagious diseases. The educated too, are woefully negligent of their water supply. That the prevalence of a disease in a locality is due to specific organisms found in the water cannot be always proven, is not absolute proof that they do not exist there or that the use of the water is safe. Neither is it proof that the organisms existing in the water of a locality where the public health is good, will not at some time invade the economy and produce the most direful results. Examination of the well water from a chemical standpoint in localities in which diseases of a certain nature occur will generally reveal the fact that the water is contaminated. By contamination is meant a suspicious amount of organic matter due generally to an animal source. A further examination will often reveal the presence of microorganisms in the water. In proof of this statement a few instances will not be out of place.

Typhoid fever is a disease, which, it has been proven beyond doubt, drinking

water will convey to a whole neighborhood. The report of the Michigan board of health for the year 1879 gives several instances in which the outbreaks were directly traceable to the drinking water used. The well was situated near the barn, as so many country wells are, the ground was clay, which probably for a long time prevented contamination by leaching. A number were sick at various times and finally by the advice of an intelligent physician an analysis of the water was made. The free ammonia and also the albuminoid ammonia existed in exceedingly large amounts. The amount of chlorine showed undoubted evidence of animal contamination. In the report of 1889 another instance is given in which chlorine and ammonia were present in large amounts. In the water were found bacteria to the number of 140 per drop. Hundreds of cases which were directly traceable to the use of drinking water have been reported to the board of health since its organization. In 1890 eighteen per cent. of the cases reported were classified as having been caused by the use of impure water. Other diseases, such as scarlet fever, diphtheria, and small pox, although not proven, are generally thought to be conveyed by means of drinking water. No standard of purity can be formulated which will adapt itself to every water but the general opinion seems to be in favor of the following which is given in part:

Chlorine—not over 10 parts per 1,000,000.

Ammonia—

Albuminoid—not over 15 parts per 1,000,000.

Free—not over 10 parts per 1,000,000.

These three elements in excess of the above figures will condemn any water and further examination of the surroundings will generally reveal the source of contamination.

Now the question arises, is any one of the elements alone an indication of contamination? It is obvious that ammonia, either free or albuminoid, is direct evidence that organic matter is, or has been, present. But is chlorine, an inorganic substance, an evidence of contamination?

Chlorides are characteristic ingredients of both human and animal excretions and as such are found mainly in the urine. It is obvious then, that a considerable amount of chlorine is found on analysis is an indication, other things being equal, that the water has been contaminated by animal excrement. Nearness to the sea, mineral springs, or salt deposits of any kind are of course exceptions. The chlorine in itself is not harmful but serves as the danger signal for other and dangerous elements. While the ammonia in either form can be found in many waters and are just as dangerous it is seldom that when chlorine is detected, we do not find the ammonia in proportionately large amounts.

I have undertaken in this investigation to determine:

First. "What reliance can be placed upon an excessive amount of chlorine in water as regards contamination."

Second. "What bearings do the surroundings of the water supply have on chlorine content?"

Third. "Is a standard requiring less than ten parts of chlorine per 1,000,000 a correct one?"

Fourth. "The general source and condition of the farmers' water supply."

The water was collected in clean glass bottles of 250 cubic centimeters capacity and careful notes taken on the well surroundings. The distance from barn, outhouse, or any other source of contamination, also any information volunteered by the owners. A standard solution of silver nitrate, one cubic centimeter of which equalled .0010646 grains of chlorine, was made up and the same standard used throughout the tests. Chromate of potash was used as an indicator, the end reaction being sharply defined. Fifty cubic centimeters of water were titrated in each estimation and the results calculated to parts per 1,000,000.

In all ninety-one analyses were made, the results of which are here tabulated. The work was all done by numbers and when a sample containing an excessive amount of chlorine was compared with

the notes taken it was invariably found that the surroundings of the supply were questionable.

Chlorine. Parts per 1,000,000.

NO.	AMT.	REMARKS.
1.	10 46.	Barn 50 feet from the well.
2.	52 30.	Out-house 50 feet from the well. See notes.
3.	10 46.	Very close to the barn.
4.	12 55.	An old barn site is twenty feet from the well.
5.	10 46.	30 feet from the barn and 40 feet from out house.
12.	140 87.	An open well. See notes.
44.	6 27.	Very close to the house; out house 40 feet.
45.	19 87.	Close to house; out house very near.
46.	8 37.	House 20 feet distant; 50 feet from barn.
57.	8 27.	Barn 50 feet distant; 40 feet from out-house.
48.	4 18.	Some distance from any buildings.
87.	21 28.	
88.	28 40.	
89.	17 75.	
90.	Trace.	College artesian well.
91.	4 18.	Spring near Cedar river.

Number two is the first water that arouses suspicion, and further inquiry reveals that the out-house is but a short distance from the well. The well is here very close to the house and contamination is evident.

Number 12. This sample created suspicion when collected, and it was no surprise to find such an amount of chlorine. The sample was taken from an open tile well on the east and west road about four miles from the college. The condition of the farm shows an utter lack of care, and if disease has not here made its appearance it is because the residents possess immunity. The well is about ten feet from the road and water is drawn with a pole. The land slopes from the south, and on the side which the dwelling and farm buildings stand, towards the well. The owner in drawing the water tips the bucket towards the north side of the well because as he says, "The water comes from that way and is much colder than after it has stood awhile in the open well." The house is an old log building and immediately back of it, and at a distance of forty feet from the well is a large manure pile. The barn is fully as old as the house and in a bad condition. It is thirty feet from the well and surrounded by manure. The out-house is forty feet distant and may contribute its quota. The soil is clay and whether the water is con-

taminated by surface or under drainage is unknown. That the water is unfit for use is evidenced by the surroundings, let alone the analysis.

Number 45. Close to the house and the out-house is very near.

Numbers 87, 88, 89, were waters analyzed in this laboratory in 1893, to determine if their contamination had any bearing on several diphtheria cases, which had occurred in Lansing during the year. There was nothing found in the mere chemical analysis however to arouse suspicion.

The general lay of the country in which the greater part of these samples were collected is level with but few hills. The soil is mostly clay, but in a few localities there is considerable sand.

The first question, "What reliance can be placed upon an excessive amount of chlorine in a water as regards contamination?" is answered to a great extent by the above. Wherever an excess of chlorine is found, with but few exceptions the surroundings of the well indicate contaminations from animal sources. And again, wherever the chlorine content is high, the ammonia content is in excess of what the standard permits and the ammonia is a positive indication of a poor water. A few assays give a large amount of ammonia with but little chlorine. They are in the minority however. The amount of chlorine thus found in a water is an indication, but not absolutely so, of contamination. The second question, "What bearings do the surroundings of a water supply have on the chlorine content?" In ninety per cent. of the cases in which the chlorine content is found to be high, the surrounding conditions are such that suspicion is aroused. In many instances however, the surroundings are exceedingly bad, while there is but little chlorine found in the water. As a rule, however, we may say that unhealthy surroundings will generally reveal a large excess of chlorine in the well water.

The third question, "Is a standard requiring less than ten parts of chlorine in 1,000,000 a correct one?" This is some-

what difficult to answer but number 71 with 6.37 parts per 1,000,000 would seem to support the claim. Several of the tabulated samples give as high as 20 parts, yet the surroundings are very good and there is no apparent contamination. The Chicago board of health has fixed the line at 15 parts per 1,000,000 and this seems more reasonable. No absolute standard can be fixed for any state or community. 15 parts per 1,000,000 however, seems much more reasonable, than ten parts in the light of the above tables.

The fourth question. "The general source and condition of the farmer's water supply?"

This is a question in which many are not well informed. The general opinion is that a well in one place is as good as in another, and in a great many places it is in the barn yard or very close to it. Of the ninety-one samples collected but two were taken from open wells. About forty per cent are located within fifty feet of the barn yard. About fifteen per cent are near the house where house slops find ready access to the water. But a small number are placed where the surroundings are above suspicion. The idea that a water may be contaminated by the leaching property of the soil does not seem to enter into the discussion when a location is under consideration. The location and condition then of farm wells is not by any means what it should be.

The exceeding dryness of the year may have tended to lower a portion of the results, and there is room for extended inquiry into the question of farm water supplies.

* The above thesis was written by a graduate of the class of '95. The agricultural students of that class were the first required to write theses and the above was selected for publication as one of interest to SPECULUM readers not only because of its being one of the first theses ever written by a class graduating from the agricultural course but also because it is on a subject of almost universal concern. For lack of space, the results of the analysis of only sixteen of the ninety-one samples taken are given, the first and last five as numbered, five from about the center of the list, and number 12 which contained more chlorine than any other sample. Of the remaining seventy-five samples, eight contain above 50 parts of chlorine per 1,000,000, sixteen between 20 and 50, fifteen between 10 and 20 and thirty-seven below 10.

THE SPECULUM.

PUBLISHED MONTHLY DURING THE COLLEGE YEAR,
BY THE STUDENTS
OF THE MICHIGAN STATE AGRICULTURAL COLLEGE.

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AGRICULTURAL COLLEGE, OCT. 15, 1895.

Do you owe for the SPEC.?

WHAT is the matter with foot ball?

SEE the college exchanges in the library.

WHAT is the matter with the student's government?

DON'T forget the oratorical contest which occurs in the Central M. E. Church at Lansing Oct. 25.

WHO is the individual with a voice like that of the notorious bull of Bashan that divides time with a neighbor's cur in disturbing the Sunday evening quiet of the campus?

AT present our athletics seem doomed to "innocuous desuetude;" the only spark of hope left, seems to proceed from the class in physical training which, thanks to the faculty, has been recently organized.

EVERY society on the grounds except one is now represented on the SPECULUM board. We believe an invitation should

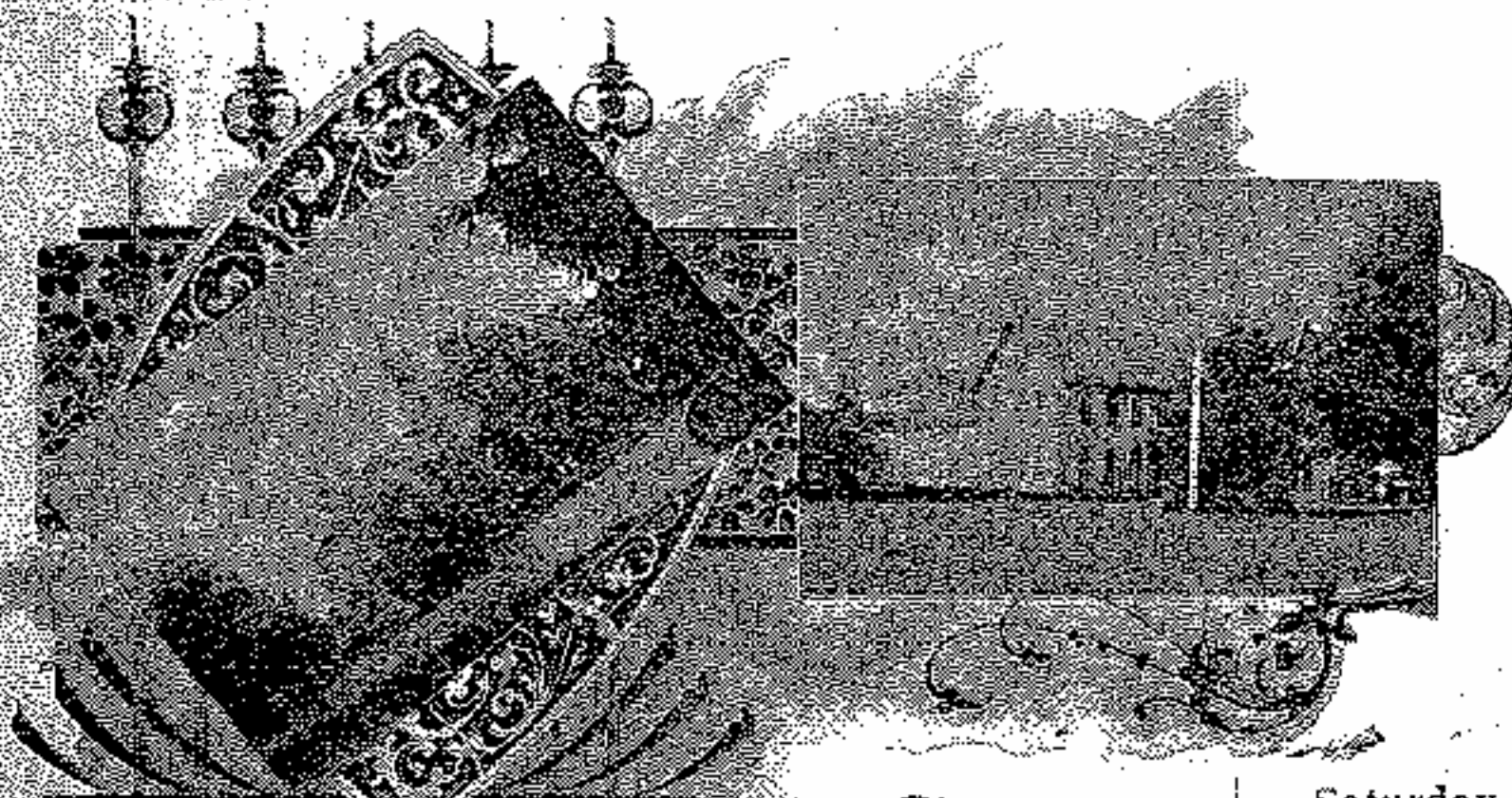
be extended to them at an early date to take part in the issue of the college paper. The SPECULUM is essentially a society organ and if for no other reason matters should be so arranged that the responsibility can be assumed directly by the societies in the event of any failure of the students' organization to maintain its affairs. It may be urged that the Feronians are not tax paying students but there is no reason for their not being such. We believe they would gladly assume this part of the burden for the sake of having a more direct voice in the handling of the affairs in which they are interested. It can not be urged that they do not have the ability to conduct a department for they have numbered and do carry on their rolls at present fully their quota of the able and influential students of the college. We hope that they may soon have a voice in management of this organ.

THE State board at its September meeting spoke again on the subject of student labor. It said: "It is easy to see that persons under peculiar conditions may be allowed to take studies without physical labor as an accompaniment; the cases of children of the faculty, employes of the institution, members of the faculty taking special studies preparatory to second degrees, post graduates of our own college, men from the teaching force of other agricultural colleges securing some special equipment for their work, are instances that occur to us. It is the object of the board to deal fairly with all." The meaning of this is as obscure as could be imagined. It removes the whole force of the sweeping resolutions given out from the meeting of June 4-5. They interpreted the organic law to excuse no one from physical labor and were as radical as this last statement is weak. Granting that there are cases where the student should not be required to perform physical labor, what reason is there for heading such with "children of the faculty?" There must be much

speculation as to what instances did not occur to the board. It is no uncommon thing for men to come here for study who are as experienced along some lines of work taken up in the shop and on the farm and garden as the men who direct the work in those departments. It is an injustice to ask a man who has walked between the plow handles, harvested the grain and sold the crop to report the operations here; nor is it likely to inspire a student to thoughts of fair dealing to require him to bend over the bench and forge when he has served an apprenticeship at the work and needs the equivalent of the time so spent to compete with his more scholarly classmate at the blackboard and over the drafting. We hope that whatever else the new expression from the board may mean it is intended to equalize some of these long standing differences.

The following is an abstract from a manuscript held in charge by the investigating committee. Attendance of Students at the M. A. C. in 1894-5 as compared with the attendance at the U. of M. Whole number at University, 2864. Whole number at M. A. C., 2864. In the department of science, literature and the arts, whole number 1525. Of these undergraduates in four year courses working for a degree there is 1,193. With many electives these have an opportunity to take any one of many courses, having a chance to pay special attention to a choice of forty studies. For the degree of B. S. at the university to be compared with our courses, there are seven courses that might be specialized. The students in these courses make a grand total of 456, with an average of 65.17 in each course. Under graduates in courses of four years, working for B. S. at the M. A. C., Whole number is 290, with an average of 145. In the University there are then other courses of a literary nature not compared to any at the M. A. C. and in neither of these are there as many four year male students as we have in the Agricultural department which is 169. Judging from these figures the easiest way to increase the number at M. A. C. is to modify the agricultural course suitable to women. In the three courses at U. of M. just about three sevenths are women, at the Normal, a very much larger per cent.

This report no doubt compares the corresponding courses of our college with the U. of M. but does it answer the query desired of the State board, which in reality is, Why has the attendance at the M. A. C. for the past five years been decreasing? This year excepted.



College News.

About the Campus.

The tri-annual catalogue is expected soon.

Students in the foundry have recently made castings for a new wood lathe.

The observatory has been repainted with a white coat.

Mrs. Noble goes to Iowa for several weeks to visit at her old home.

Mrs. Edwards has left for Virginia to spend the winter with her parents.

Paul Woodworth, Jr. and his mother will visit the Woodworths at Caseville.

Hon. James M. Wilkinson, State Treasurer, paid the college a visit recently.

Mrs. O. Clute, Kathy, Marion and Ed. safely arrived at their Florida home, Lake City, Sept. 26.

Miss Fay Wheeler was taken ill by an attack of the inflammatory rheumatism, but is fast improving.

Prof. Holdsworth's father and sister from Traverse have been visiting at the college for the past week.

Miss Dorothy Lewis entertained the faculty children the afternoon of Oct. 8, in honor of her second birthday.

Mrs. A. L. Wescott and son, accompanied by Miss Josephine Greening, go to Toledo the first of November to spend the winter.

Mr. Fred C. Kenney fills the place in the Secretary's office formerly held by Mr. Bradley. Mr. Kenney was recently an employe in the auditor's office of the Manistee & Northeastern railway company.

Master Guy Gorton is in receipt of a bicycle as a reminder of his tenth birthday.

Prof. H. W. Mumford spent several days at his home at Hillsdale and vicinity.

Superintendent Church, of the Blind School, will speak Friday evening at the chapel; subject, "The Island of Hawaii." He has spent some time on the island and will illustrate his lecture by specimens which he secured while there.

Saturday, Sept. 21, the Methodist Sunday school from Williamston picniced on the campus.

The Bell Telephone Company and the Lansing Telephone Exchange are having a "set-to" over the college trade.

Mr. G. A. True, brother of E. D. A. True, with '78, has entered here and will do special work in the butter-making line.

The Eclectic society entertained the members of the faculty the evening of Sept. 26, and on Oct. 4th they were invited to the Hesperian rooms.

November 1st, a literary meeting of the two fraternities and Feronian society will be given at the chapel. If this effort meets with success it will no doubt be made an annual affair.

Kalamazoo *Telegraph* of last week mentioned the following: "C. D. Smith, L. R. Taft, L. G. Gorton and I. H. Butterfield, students in the Agricultural College at Lansing, rode over on their 'bikes' this week."

Prof. A. T. Stevens and wife are safely settled at Greensborough, North Carolina. He reports the weather as very dry and hot for September. Besides agriculture, he teaches horticulture, botany, floriculture and landscape gardening, but expects to be relieved soon.

The members of the Y. M. C. A. had the pleasure of meeting Mr. Gilbert Beaver, of the International Committee, last Monday evening. Mr. Beaver stopped, while on his way to Chicago, to visit two or three of the Michigan college Y. M. C. A.'s. The University, M. A. C. and Hillsdale were the favored ones.

Ten delegates from M. A. C. were in attendance at the Bible Institute held at Albion Friday, Saturday and Sunday of last week. They report a very pleasant and profitable meeting. Between fifty and sixty delegates from various colleges were present. The University, Hillsdale, Kalamazoo and others were represented. Prof. W. W. White, of Chicago, was the principal speaker and brought to the institute his usual earnestness and enthusiasm, which awakened in all hearers new appreciation of the Bible.

The Lindstrom butyrometer, an instrument invent-

ed and imported from Holland, has just been received in the dairy department. It is used for testing butter fat and is similar to the Babcock milk tester but perhaps more accurate. Its high price will limit the sale.

Dr. Kedzie has subscribed for a Bell telephone for his house.

A sample of the Ellwood farm fence has been presented to the college. It will be erected along the lane south of the hog barn.

The class in stock breeding this term, for the first time, will be required to write a paper on some subject closely related to their work.

Among the students who have entered for special work this fall is Prof. Charles D. Thompson, from the Oregon Agricultural College. He intends to secure an M. S.

The library has been repiped for steam so as to heat it from the main boiler plant. It was formally heated by hot water but it was found that the steam was more economical.

Harrison's place near the college gate, is doing a good business. Nearly every room is engaged. We hope that this success will encourage others to build near the college and in the end do away with the dormitories.

The junior class have begun their cat dissections, previous to this the work has been completed in the spring term. As the laboratory work is done from five to six in the afternoon, incandescent lamps have been added.

The librarian has made arrangements with publishing companies so that books can be received on approval and if not satisfactory may be returned. Previous to this books have been purchased entirely on their title and in many cases the results have not been the best.

Since the completion of the hospital, the college population have shunned sickness. No severe cases have occurred in over a year. Yet this apparently good sanitary condition should not discourage or prevent the authorities from placing water-closets in respectable order.

Dr. Kedzie has received thirty choice varieties of wheat from the department of agriculture, including the best kinds from Russia, Liberia, Greece and Japan. These specimens with numerous other kinds are mounted in glass bottles, and are to be seen at the chemical laboratory. They are worth seeing.

HORTICULTURAL DEPARTMENT.

"The stables in the garden barn are being rearranged. A new grain and harness room has been built.

Mr. Rogers, formerly in the greenhouse, has been promoted to succeed Mr. Tryon as superintendent of the grounds at the Industrial school for boys at Lansing. Mr. Tryon goes to Oregon as instructor in botany. This makes the fourth M. A. C. student who has been located at Oregon this year. Charles John-

son, a mechanical freshman, takes the position vacated by Mr. Rogers. Previous to his coming here he served four years at Castle Ashby, England, as an apprentice under Mr. Henry Birch, who is the gardener to the marquis of Northampton.

Dr. Beal and Prof. Taft went to Traverse City to attend the State Horticultural Society which was held in connection with the county fair. Mr. F. N. Payne, with '89, exhibited a very large collection of greenhouse plants and flowers, securing second prize. Dr. Beal spoke on "Management of Village Parks" and "Forest Fires."

MATHEMATICAL DEPARTMENT.

This department has been supplied with half dozen big signals for triangulation work. It is probable that more extensive work in triangulation will be carried on in the future than has been attempted heretofore, as sights two miles long can be easily made.

Through the kindness of Mr. Pashby, the readers of THE SPECULUM can get a glimpse of the new meridian line. At but very few points on the surface of the earth does the magnetic needle point towards the pole and at any given point the amount of the declinator is constantly varying so it becomes necessary for the surveyor to have a true meridian on which to test his needle. A number of such lines have been established at different times and at different places here at the college grounds. Some of them have been laid down by students in their class work and all have been too short to pass a high degree of accuracy. The last one established is probably the most accurate, being the mean of a large number of observations taken on Polaris at eastern elongation. At the south, the line rests on artificial stone set in the turf near the site of the old botanical laboratory. At the north the direction of the line is marked by the notches cut in the edges of the walk in front of Dr. Kedzie's residence, the length between the points of reference being 780 feet. The line will find one practical use in answering questions from county surveyors as to the declination of the needle. It will also be used as a meridian line to determine time by taking the transits of stars and the sun.

BOTANICAL LABORATORY.

A castor oil plant in the wild garden measures fifteen feet tall.

At the tri-state fair recently held at Toledo, Ohio, a prize of \$100 was offered for the best collection of noxious weeds, and \$50 for the second best, also at Hillsdale, in this State, suitable rewards were given for similar collections. This is no doubt a good method to educate the masses into the identification of noxious weeds.

Within the past year the appearance of the Russian thistle in this State has awakened all who are interested in the welfare of the agricultural districts. The weed has appeared this fall along the line of the Chicago & Grand Trunk railway, west, of Port Huron. It is undoubtedly the worst pest in the form of a weed

that ever gained a foothold in this country. About twenty-two years ago some Russians immigrants, who settled in southeast Dakota, brought over and sowed in their settlement some barley containing the weed. For many years it made slow progress, but recently it has spread with frightful rapidity, has overrun considerable portions of several western States, and in many places has almost stopped farming operations. It was first detected in Michigan at Charlevoix in September, '94. We should look upon the encroachment of the thistle as a dangerous plague or pest that is threatening the invasion of our whole territory. It has now just entered the State, but let it be crushed at once.

The work of Mr. McCallum in the laboratory is particularly interesting. He makes the following report: "Among the several fungi that I have lately been working on those of the tomato and apple diseases are of special importance. The black rot of the tomato was developed in nutrient solution, and the method of growth and spore formation observed. Unaffected tomatoes were infected with the spores. In those cases when the skin was broken and spores placed on the fleshy part, the disease was invariably produced, but when they were only placed on the epidermis, though they frequently germinated, they would not pierce through and consequently did no harm. The spores were found to readily germinate and produce the disease on apples and potatoes, if these were inoculated under the skin and then kept in a moist atmosphere. Another interesting tomato disease, fusarium, was worked upon in the same way, observing the various phases of its growth in artificial culture and developing it on other fruits. Another species of the same disease is affecting the beans and I am trying to find out if the spores produced by each will develop the trouble on the other. Also investigating the scab and bitter rot of apples. The latter has affected about one-half the apples in the orchard. It appears as small brown spots at first, which rapidly spread until the whole apple is rotted right to the core. It is a most precarious fungus to work with, the spores developing in such a variety of ways under the same conditions. Quite a number of apples were inoculated and in every case the disease was produced. It also effects the grape, and spores from the apple were injected into sound grapes and vice versa. Both sets of experiments were successful."

FARM DEPARTMENT.

Owing to the abundance of the corn crop only one-half was needed to fill the silos.

Each section of the class in stock judging spent an afternoon at the stock farm of the Hon. James M. Turner.

Thirty acres of golden chaff wheat have been sown. One half the seed was treated with hot water and the remaining with blue vitrol. Both of these treatments for smut are somewhat defective but are the best now known.

The earliest sown rape has been badly injured by plant lice, some fields nearly ruined. These insects are more troublesome in a dry season.

This year's experiments with millet have again shown that northern grown seed matures earlier and when harvested gives a larger yield than the southern millet.

Mr. H. E. Van Norman, with '97, attended a number of the county's fairs as representative of the State Dairymen's Association. Mr. Van Norman acted as judge of the dairy products.

In field No. 8 a second crop of oats has been harvested. The dry weather earlier in the spring stunted the growth, and not until the fall rains was the grand total harvest gathered.

Four patent stalls for dairy cows have been placed in the barn, two Brown and two Bidwell. The intention is to test the workings of the same and to have them open for inspection by visitors.

The "Farmers' Home Reading circle" are receiving more orders for books at this season of the year than ever before. This shows that the farmers are beginning to appreciate the value of the course as outlined.

The series of plats in No. 5 will be tested with different rotations of crops. The clover and rye will be grown to furnish fertilizers for succeeding crops. Of a large number of rotations the following are a few: wheat, clover; wheat, clover, grass, corn; wheat, clover, potatoes, beans, rye, wheat, corn, clover. These rotations will be continued indefinitely on the same plot.

A second trial of the corn harvester at the college farm in September, resulted as follows: Two and three-fourths acres of corn were cut and shocked by three men by hand in six and one-half hours. This was equal to nineteen and one-half hours for one man. The same area was cut and bound by the Deering harvester, with of course one man and team in three hours. It took two men five and one-half hours to set these bundles up in shocks. Counting the team as one man and making no allowance for the machine, the two and three-fourths acres were cut and shocked in seventeen and one-half hours, time of one man. This was an apparent gain of two hours on the side of the machine. But it required twelve pounds of twine to bind the bundles. This was worth approximately one dollar. The financial economy was against the machine and in favor of the old fashioned method.

MINUTES OF THE STATE BOARD.

The meeting of Sept. 10, held at Sweet's hotel, Grand Rapids. The more important business being as follows:

Prof. H. W. Mumford was appointed secretary of the Farm Home Reading Circle.

The salary of Mr. Newell was increased from five to six hundred dollars.

A committee consisting of Dr. Edwards, Prof. Smith and Prof. F. S. Kedzie were selected to carefully in-

quire into causes which have contributed to the seemingly lack of popularity of our college.

The October meeting held at the South Haven experiment station the following report was noted: The board, accompanied by Prof. Smith and Taft, were conducted through the grounds of Hon. T. T. Lyon, the venerable superintendent. They gave a cursory examination to all, and a special examination of the varieties still in fruitage, finding everything in evidence of the careful attention and culture they were receiving.

PERSONALS.

We desire the earnest co-operation of every person who has ever been connected with the college in trying to make this department an interesting one. Let every alumnus and every person who has been with classes here send in news to the editor of the department, often, thus making his work much easier and the department more interesting to all.

'77.

W. C. Latta, professor of agriculture at Perdue University, Ind., has been given full control of the agricultural department in that institution.

'81.

Prof. Charles W. McCurdy of the university of Idaho, received the degree of Ph. D., Doctor of Philosophy, at the last commencement of the university of Wooster, O., upon the completion of its post graduate course in chemistry. Also the American Association for the Advancement of Science at its Springfield meeting last month elected him to a fellowship in that distinguished body of scientists. Mr. McCurdy is professor of chemistry in the Idaho university.

'84.

Orel L. Hershiser was at the State fair with a display of bees and honey. After leaving the college Mr. Hershiser studied law with Daniel McMillan, a well known Buffalo lawyer, until admitted to the bar. He has kept up his apiary and has gained such a reputation that he was chosen to take charge of the apiary display from New York State at the World's Fair.

'86.

J. E. Hammond was elected president of The Knights and Ladies of Security, a new insurance order, at the last meeting in Lansing.

O. O. Dunham was one of the participants in the capture of Smalley, the train robber at McBain.

'87.

Edwin Redman, city surveyor for Grand Rapids, is a man of growing importance.

'89.

G. L. Flower is secretary to the superintendent of U. S. coast and geodetic survey in Washington, D. C.

A. D. Baker was married Oct. 8 to Miss Edith Cooley of Lansing. They will reside in Lansing.

Lemuel Churchill is with a wholesale drug house in St. Paul, Minn.

J. W. O'Bannon is going to open a law office in Terre Coupee, Ind.

Ray S. Baker is editorial writer on the staff of the Chicago Record.

'90.

A. Latcha Waters is assistant mine superintendent of the Little Fanny mine at Mogollon, New Mexico, ninety miles, by stage, northwest of Silver City. It is one of the best gold and silver mine in New Mexico.

Wm. Petrie is a farmer at Conneaut Lake Pennsylvania.

John W. Toan is studying medicine in Detroit and not at "the U. of M." as stated in the last issue.

Through the kindness of Hon. C. W. Garfield, we learn of the death of Orlando A. Turner at Leipsic, Ohio. His career here was very commendable, and was in every way a promising young man. THE SPECULUM extends sympathy.

A. C. Redding, professor of chemistry and physics at Findlay College, has received the appointment of principal assayer for a leading mining company in Oregon; accept our congratulations professor.

WITH '90.

Jas. H. Heard is at Ontonagon, Mich., in the "resort" business will all of the modern and popular improvements. Boats, chiefly schooners, etc.

'91.

Clayton T. Cook is a "senior law" at the "U. of M." He has been science teacher in the Flint school for the past year.

'92.

B. W. Peet is science teacher in the Grand Rapids high school.

G. E. Ewing is running a farm at Ross, Kent county. He is said to be the same old fellow, big, bushy and enthusiastic.

D. W. Trine has received the appointment to the position of instructor in botany at the Oregon Agricultural College at Corvallis.

John Hinkson graduated as M. D. from the University of Michigan last summer, and is now practicing medicine at Lexington, Mich.

'93.

R. B. Pickett is president of the Jackson county Teachers' Association.

WITH '93.

Harry Haak is in the lumber business with his father at Luther, Mich.

Mr. Lyon has been here for a few days. He is superintendent of a condensed milk factory at Northville, Mich.

W. F. Hopkins, who has been working in a bank at Petoskey, has returned to his home in Lansing.

'94.

Geo. Simmons is in a draughting office in Fort Wayne, Indiana.

'94.

D. D. McArthur writes that he is settled down in his new home in Greenwood, South Dakota, and is happy.

L. B. Plummer is principal of schools at Burnips Corners, Mich.

J. W. Perrigo is spending his spare time at draughting for the Detroit Motor Company. He is teacher of mechanical drawing in the Detroit Business University.

Reuben Campbell, principal of the Saranac schools, has given up teaching for a time on account of neuralgia of the face.

E. V. Johnston is with C. A. Strelinger & Company, hardware dealers in Detroit, Mich.

WITH '94.

W. G. Merritt is in Pennsylvania inspecting chemical plants.

'95.

H. E. Ward is running a farm at Ada, Mich.

W. C. Bagley is principal of schools at Garth, Mich., E. J. Heck at Grandville, L. H. Van Wormer at Overisel, and F. P. Normington at Connorsburg.

H. R. Smith is teaching chemistry and physics in the Tilford Collegiate Academy in Vinton, Iowa.

Harry Parrish, "Josh," is assistant engineer on the steamer Rappahannock. He "spouses that M. A. C. gets along all right without him, except that there is no one there now to sing, 'After the Ball.'"

G. H. Frace is in a store with his father at Saranac.

H. R. Allen visited friends at the college recently.

W. J. Goodenough is working in Detroit for the Detroit Electrical Company.

WITH '95.

E. J. Quingley is getting rich acting as agent for an oil and varnish house in Grand Rapids.

P. S. Rose is teaching at Old Mission, Mich.

'96.

E. E. Gallup was elected president of the Ingham county teachers association at their last election.

WITH '96.

Mr. Thomas who has been on the sick bed for two years is now improving.

C. R. Tock visited M. A. C. recently.

Guy Van Alstyne is a hustling reporter for the Evening Press of Grand Rapids.

George Fisher is employed in his uncle's store in Grand Rapids where he handles cut glass, fancy crockery, etc.

W. R. C. Smith "the Broker" visited the college on the evening of Sept. 17. His silk tie and walking stick indicated a prosperous condition. He is on the advertising staff of the *Electric Industries* a Chicago paper.

Fred Schwaderer has been working on the farm at Cass City, Mich. He expects to enter college again in the spring and go through with '98.

Rumor has it that Frank Fairweather is married,

Chas Seed is running a job printing establishment of his own at Cass City, Mich.

WITH '97.

Jay Rhodes, "Dusty" has entered Albion College

C. A. Graves is very ill with typhoid fever.

G. C. Humphrey is working on the farm near Adrain.

"Weary" Walker is training with the football team of the Detroit high school. He will return to M. A. C. in the spring.

Wm. Russell is assisting his uncle in a drug store at Gaylord, Mich. He contemplates fitting up a laboratory shortly for chemical work preparatory to taking the State pharmaceutical examination.

F. E. Barr was married Oct. 9, to Miss Della Greenman of Penfield, Mich.

WITH '98.

O. R. Cole has entered Albion College. He will make a valuable addition to their athletic team.

J. G. Howe visited his brother here recently. He will resume his studies here next spring.

Geo. Clark talks of coming back to college in the spring.

E. B. Wallace will return to college in the spring.

ATHLETICS.

Our last local field day was held September 21. The weather was fine and the entries showed up fairly well. Much credit is due the managers, F. W. Herbert and I. L. Simmons, for their efforts to make the day a successful one.

Two new men did very well and give great promise for future work. Ewing, '98, in the pole vault, and Krental, '98, in the running broad jump.

The events came off as follows:

The 100 yards dash, won by Rider, '96, in 11 sec., was exciting. Rider, '96, Krental, '98, and Partridge, '96, were close together until the finish, when Partridge fouled and Krental got second.

The standing broad jump was won easily by Partridge, '96, distance 9 ft. 8 in.; second Pond, '97, 9 ft. 6½ in.

The 220 yards dash was won by Rider, '96, time 24 sec.; second Meyers, '96, 26 sec.

The running broad jump was won by Krental, '98, 18 ft. 4 in.; second Ewing, '98, 17 ft. 3½ in.; third Pond, '97, 17 ft.

The 440 yards run was won easily by Rider, '96, in 63 sec.; second Partridge, '96, 66 sec.

The ¼ mile bicycle was won by Thompson, '96, time 49 sec.; second Jaques.

The hammer throw was won by Becker, '98, distance 65 ft.; second Pond, '97, 52 ft. 6 in.

The ½ mile run was won by Tracy, '96, time 2 min. 44 sec. In this race Tracy made a good spurt in the finish, leaving the others "in the dark"; second Marsh, '98.

The running hop, step, and jump was won by Krental, '98, 38 ft. 5 in.; second Pond '97, 37 ft. 7 in.; third Partridge, '96.

The pole vault was won by Ewing, '98, 8 ft.; second Pond, '97, 7 ft. 9 in.; third Partridge, '96.

The one mile bicycle created some merriment, Thompson, '96, rode a tandem, and beat Jaques, '96, who managed to keep his wheel on the track long enough to cross the line. The record was "smashed" twice.

The 120 yard hurdle, one mile bicycle, and relay races were forfeited to '96. Putting shot was forfeited to '98.

On points, '96, won for the third successive time the Bracket class cup. Much praise is due Partridge, Rider, Tracy, Thompson, Meyers and Jaques, (?) for their efforts to hold the cup.

Among the many athletes who are developing fast, we desire to make mention of Partridge, '96. Besides being a good student, Mr. Partridge has done very well in all the athletic events in which he has contested. His work shows that he is a good possibility for M. A. C.'s all-around next year. It reflects great credit in the college.

The sports of the day were concluded by a ball game between Wacousta and M. A. C. The feature of the game was Chase's work at bat. Mr. Chase is a valuable addition to our team. The following is a record of the game:

M. A. C. VS. WACOUSTA—SEPTEMBER 21.

M. A. C.

	AB	R	H	SH	PO	A	E
Gorenflo, c f	4	3	0	0	1	0	1
Reed, p	5	5	3	0	1	2	1
McKinnon, 2 b	5	3	3	2	0	2	3
Chase, 1 b	5	3	4	0	7	0	0
Crosby, 3 b	5	1	1	0	1	1	1
Krental, c	5	1	0	0	8	1	1
Chapin, s s	5	1	1	0	0	0	3
McLouth, 1 f	4	0	1	0	0	0	0
Gunnison, r f	4	2	1	1	0	0	0
Total	42	19	14	3	18	6	10

WACOUSTA.

	AB	R	H	SH	PO	A	E
Wilder, 1 b	4	1	0	0	7	0	5
Burns, c	3	1	0	0	3	3	1
Eddy, 3 b	3	1	2	0	0	0	0
Waldo, r f, p	3	1	0	0	0	0	0
Hall, p, s s	3	1	1	0	1	1	1
Elliott, 1 f	3	0	0	0	0	0	1
Stray, c f	3	0	1	0	0	0	0
Harris, s s, r f	3	0	1	0	3	2	4
Oliver, 2 b	3	0	0	0	4	6	1
Total	28	5	4	0	18	12	13

	1	2	3	4	5	6	R	H	E
Wacousta,	0	0	1	0	4	0	5	4	13
M. A. C.,	4	3	0	5	3	4	19	14	10

Earned runs, M. A. C. 3. Wacousta 0; two-base hits, M. A. C. 3. Wacousta 0; three-base hits, M. A. C. 2, Wacousta 0; home runs Chase 2; hit by pitched ball by Hall 2; base on balls by Reed 1, Hall 2, Wild pitches, Hall 5; passed ball, Burns 5; struck out by Reed 7, by Hall 2, Waldo 1. Umpire, Bracket.

Sept. 28. The '98 class team beat the Lansing high school team by a score of 6-4, 3 innings. The same day that famous team from Bath with "pitcher Hall" arrived on the grounds. Notwithstanding the fact that a team had to be picked from among the students, our boys satisfied their curiosity by a score of 15-5 in 5 innings. Warren, '98, pitched for M. A. C. and did good work.

On our local field day, one drawback which discouraged our athletic enthusiasts was the lack of attendance on the part of the students. This with the events which were forfeited does not speak very well. If we want athletics, and past experience shows us that we certainly do, we must have enthusiasm that will "fire" our athlete and base ball teams. "Fill 'em full of steam". Your editor publishes a clipping from the Grand Rapids Evening Press. Oct. 7.—

"The foot ball cranks, students and faculty, held a rousing mass meeting at Ann Arbor Saturday night and raised \$500 by subscription for their chosen eleven." This is the kind of enthusiasm we need, especially the money part. It is certainly disgusting to note that seniors, juniors and other students don't pay their students organization taxes because of many petty trifles and misjudged wrongs. Students, let us get square with our creditors this fall, and start next term with an honest bank book. We should be men, athletes, and be above trifles.

Foot ball has practically gone up. To whom is this due? To the faculty, to the students, or to the foot ball enthusiasm.

In the way of athletics an important movement is ventured by our college faculty for the last half of the term. We are to have physical culture, a physical director, and possibly a "gym". Mr. Lyon, who for two years was physical director at Olivet college, has been engaged as physical director here. One hour (4 p. m.—5 p. m.) of each college day (except Thursday) will be devoted to physical culture. The class has met now for one week, about 100 are taking the work. Mr. Lyon is a competent director and every student will profit by his methods in gaining health strength. This movement is wholly an experiment and optional. It rests with us, as students, to prove the success of it. If this is a success after a fair trial, we have good reasons for saying much more can be expected from our faculty.

Students, we have practically gained a point. Let us now show our appreciation by a general improvement "all along the line" of college work. The first important step has been taken toward progress, thanks to our faculty. Now is not the time for any individual student to shirk a single duty.

COLLEGES AND EXCHANGES.

With the opening of the new year in college life, we welcome to our table many excellent college papers.

The September issue of *The Purdue Exponent* contains an interesting article favoring college organizations.

From our exchanges we learn that M. A. C. is not the only college complaining of the small number in the class of '99. "There are others."

The Baker University *Index* for September, devotes nearly the entire issue to the inaugural address of President L. H. Murlin.

The duty which a student owes his college paper is not fully recognized, we fear, by all our students. A college paper is essentially for the students who are within the college walls. Then should we not all be interested in its existence? And might not our interest be expressed in a better way than by reading the paper for which one of our friends has subscribed and paid his money? This is robbery in a triple sense. We are robbing the paper of its just dues, for we get what it has to offer us without paying for it; we are robbing our friend, for we are sharing with him the recompense of his money, and we are robbing ourselves of the satisfaction of knowing that we are helping the paper, not injuring our friend, and enjoying the contents that are rightfully ours. It should be the duty as well as privilege of every student in Earlham College to subscribe for his college paper.—*The Earlhamite*.

TRUE FRIENDS.

True friends are rare as diamonds in the sand,
Or gold that hides beneath the silent deep,
Far from the miser's soul engrossing heap.
When sadness or dire illness thins the hand,
Or age advances like a fearful band
Of robbers, whose sole law it were to steep
Their blades in blood of those who dare to keep
Their own, a friend's a treasure to command.
Cherish them wisely, for existence fails
Alas! too soon, and death divides true friends;
But here, or yonder 'mid the shining stars,
Love them as well, for friendship still avails
To gain kind intercession, till ascends
A soul unblemished to the golden bars.

—*The Notre Dame Scholastic*.

A LIBERAL EDUCATION FIRST.

It is all right to specialize, but a broad liberal education and training should first be acquired. Those men who have best succeeded as specialists are the men who have been thorough students along general lines.

We cannot help but admit that the difficulty existing in our country to-day is that too few of us have any insight at all into the important questions concerning

our great institutions. We are not interested in them, because our education has been narrow. Few are persevering and industrious enough to become acquainted with them. And this is almost invariably the case when we enter upon a special calling without having previously taken a broad and liberal course of studies. Very few of us ever find time, after we are engaged in our special work, to make ourselves familiar with other branches of learning.—*The Student Record*.



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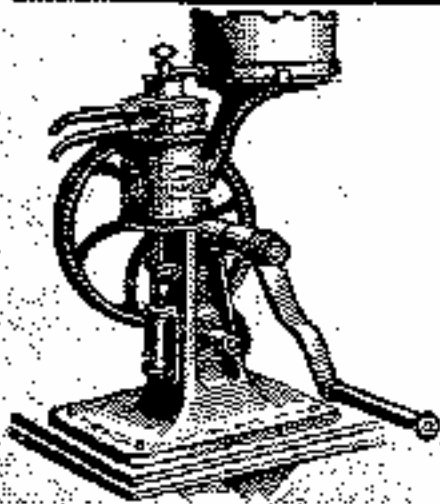
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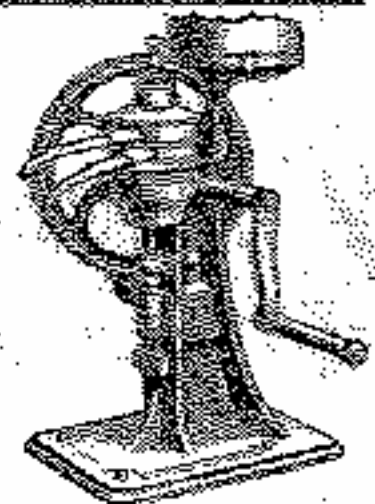
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