

# THE SPECULUM.

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WHOLE No. 51.

## To a Robin.

Ah! thou fluffy breasted wand'rer,  
Why so early dost thou roam?  
Didst the zephyrs of the Southland  
Tempt thee to thy summer home?  
But thou seest 't is not yet springtime,  
Not yet canst thou rear thy nest;  
For the tardy winter snowflakes  
Wilt keep thee from thy vernal quest.  
Yet I see thou art not gloomy,  
When in disappointment's hour  
Wintry winds are round thee blowing,  
And stormy clouds above thee lower;  
For I see thee gaily playing,  
Hopping round upon the snow,  
And I hear thy cheery chirping—  
Thou art happy I do know.  
Mighty man hast said thou lackest  
Soul or spirit—thou hast naught  
Of Reason—hast no heaven—  
Yet of thee I can be taught.  
And my prayer is now, sweet robin,  
That when winds of ill do blow,  
I may call to mind thy blitheness,  
When slept Spring beneath the snow.

M. A. C., March, 1891.

A.

## Kentucky.

### To the Speculum:

The only excuse I can offer for writing a letter to the SPECULUM is that the editor asked me to do so. Those at M. A. C. who have not forgotten "Pa Ferris" know that such a request would start his all too ready pen.

Kentucky was never surveyed by the general government into townships and sections. In general, land is granted to the citizens by the governor on orders issued by the county court. The grant is described by the stream upon which it is located, and more particularly described by marked timber corners. The state does not sell the

land. The only expenses are the county court fee of five cents per acre, and the surveyor's charges. As there is no limit to the number of times the same parcel of land may be granted, many complications that bring rich harvests to lawyers and abstract companies ensue.

Southeastern Kentucky has felt little of the advancement of the present century. Railroads have not yet penetrated the mountains. The wagon roads that wind over the rocks and along the creek beds are unworthy the name. Thus with no ready means of communicating with the outside world it is not strange that the mountaineers have made little progress. They require little that the country does not produce. Corn bread and pork is the diet. The mountain streams furnish ample power, a few weeks' work for one man builds a grist mill, and "daily bread" is insured. Acorns and chestnuts fatten the hogs, with no care of the owner. Where nature does so much man is willing that woman should do the rest.

It is only a few years since capitalists became interested in the mineral wealth of this part of the State. Coal is abundant, and iron ore is plentiful in the Pine Mountain Range. Timber—chiefly poplar, oak of several species, chestnut and walnut—covers the mountain sides with a heavy growth. Land companies have been organized operating with New York and English capital, to buy the land, and now own about two-thirds of all the land in several counties. The work of the surveyors, then, is making re-surveys of these land grants. Where a tract is covered by several grants the problem takes huge proportions, and calls in question the land laws of the State, a few of which the surveyor is expected to know.

"Ye Editor" suggested that I might tell the SPECULUM some experiences I have encountered during my stay in the mountains. I have too great an opinion of my reputation for telling the truth to act on his suggestion; however, I might tell of a wild cat hunt, of a cyclone or something worse, that blew our tents away, of long rides upon a faithful (?) mule, and of scenes my "Kodak" and I have witnessed, but I won't.

Bidding its readers a tired good night, I remain as ever a hearty supporter of the SPECULUM.

CHAS. FERRIS.

Big Creek. Ky.

### Military Drill—Its Benefit to Students.

H. N. PECK, HESPERIAN SOCIETY.

When we find an institution graduating the majority of its men with exceptionally bright records, we are forced to admire its educational ability. But when we learn that the mental development of any of these men has only a weak, emaciated body to sustain it, how soon we find our admiration changing! There is something wrong. Either the institution is coming far short of its aim, or else the students have been so thoughtless as to sacrifice their chance of a successful life-work, for temporary distinction in the class-room. College years come just at that time when nature is giving our bodies the finishing touches, in her transformation of the boy into the man; and whatever point of defect or perfection we receive at this time we may expect to carry through life.

How careful, then, we should be to embrace every opportunity to engage in any exercise that will tend to our best physical development, and so ensure a stronger constitution. It is a well established fact that the physical stamina of a man determines largely what shall be his mental radius. This being so, there is certainly a need of developing both body and mind together. And so I say again, that whatever offers to fulfill this

need should be eagerly espoused by the student.

Military drill is systematic and orderly in its training, and has numerous points of exceptional merit, some of which we wish to notice. Besides there being the necessity of drilling mostly in the open air, there is the additional charm of a patriotic garb. In taking the "position of the soldier," while both shoulders should be equally advanced, yet they must be thrown back and kept at the same height. The same is largely true of the hips, the body resting squarely on both feet. The result is, therefore, to correct any tendency to round shoulders, and to straighten any curvature of the spine; and many there are who suffer from these deformities. The "setting up" exercises are most excellent for keeping the shoulders back, and increasing the chest capacity—a matter of first importance to all who would have good strong lungs and plenty of breathing room. Also there is steadiness and rectitude of posture secured by systematic exercise of the lower limbs.

There is a right way to walk, an easy way, a graceful way. Notice people as to this matter, and see if you do not think they are sadly in need of instruction. One wobbles from side to side as if he had difficulty in keeping his equilibrium; a second, especially if a woman, bobs up and down much like a rubber ball; while a third goes with a heel action, tending to throw him back each step he takes. Is not this your observation?

The recruit is taught how to walk. He learns that the body resting slightly forward, the feet at such an angle, a cadence in the step, and the toe of the foot well depressed, all tend to easy and graceful locomotion. I might remark here that perhaps some have observed ladies walk with such peculiar grace, that their bearing might well be called queenly. Let me suggest that it was not due to high heels on the shoes, but rather the reverse, together with a practiced ease in always touching the ball of the foot first.

This gives elasticity to the step and avoids jar. There is also a right way to run, which receives due attention in this discipline.

Military training develops alertness. The cat is seldom taken by surprise, because it is a cat's nature, when awake, to be always ready for motion. This cat-like peculiarity is much developed in the soldier; he must not be taken unawares, but be prompt to act at any command. And it is easy to suppose that this training will serve him many a good turn in after life.

Besides the exercise and the physical training secured, military drill develops many other qualities that are quite essential to the man of public life. Self-command is greatly strengthened. One of the first things taught is obedience without a murmur. But what is the benefit? Just this much: If holding the tongue when prompted or criticised is not a natural accomplishment of the recruit, he now receives some practical lessons in this virtue, and must feel more than ever that obedience comes before authority. He learns that it is not essential that he see every thing that takes place around him, and that it is possible to avoid turning the head, even when there is a great temptation to do so. Doubtless this experience will come often to the rescue at other times than at drill.

Presence of mind is cultivated. This faculty must be constantly and studiously exercised. The captain has an unusual opportunity for receiving benefit in this respect. He must appear before the company, knowing that all eyes may be turned on him, and that none will be backward in proclaiming his defects in bearing and command. He must not feel his own presence, and yet make his own presence felt. The whole company must be manipulated as one machine, and at the same time, each individual looked after as composing an important part. Commands must be so given that the company will execute the right movement at precisely the proper time, so that there may be no mistakes or confusion. Knowing that pres-

ence of mind and executive ability are prime factors to success, in any calling whatsoever, who can doubt the utility of this schooling? Men need a leader. Any move of society must have a head, fearless to speak, and decisive to act. And has not the man who has had military discipline received many valuable lessons that will fit him, in part, for just these positions?

And now, knowing that the mental is dependent largely upon the physical; that presence of mind, self-reliance, and executive ability are all essential to the best success in life; and that military drill is a practical school for the development and the exercise of these qualities, can we for a moment have any doubts as to the resulting benefits of its training? Then, to get the most good out of the military department, there must be interest taken in the drill. Let it arouse something in the way of enthusiasm. The drill hour should be felt to be an hour of recreation; a time to put aside all thought of regular studies, and to give the mind a needed rest.

### Milan to Lucerne over the St. Gothard Railway.

W. H. VAN DEVORT.

We left Milan at 6 A. M., and were soon speeding northward across the broad, fertile plains of Lombardy. Before us, and to our right, stretching away in the distance, lay the snow-capped Alps, grand in the coloring of the rising sun.

A run of two hours brought us to Como, which is beautifully situated at the head of that famous lake, in a fertile valley surrounded by picturesque hills. We caught a glimpse of Lake Como as we passed, and entering a tunnel one and three-fourths miles in length, bade good-bye to sunny Italy, and prepared ourselves for the first glimpses of Switzerland. At Chiasso, the first stop in the Swiss frontier, luggage was examined, and then commenced the glorious scenery of the

Alpine pass. Here the great St. Gothard railway may be said to commence. For several miles it winds along the broad, beautiful valley of the Ticino, through numerous small villages.

Soon we reached Lake Lugano, the east shore of which the road followed for several miles. The day was bright and beautiful, and the shadows of the mountains were reflected so distinctly in the clear waters of the lake, that the reflected images were quite as charming as the real ones. Crossing the lake at a narrow point we reached the town of Lugano, superbly situated at the head of the lake, and at the foot of Mount San Salvatore. Following on up the valley of the pass we reached the town of Bellinzona, remarkably situated on a rocky ridge in the middle of the valley, between precipitous mountain sides. Here the ordinary locomotive was exchanged for a more powerful one and by a series of steep grades we slowly began the ascent. The valley rapidly narrows from Bellinzona. Tunnel after tunnel was passed through, and by the time we had reached Airolo, the southern entrance to the great tunnel, nearly 4,000 feet above the sea, the road had, by a series of loops, crossed itself four times. At one position we could look up and see two lines of the road above us. Entering a tunnel we soon emerged to find ourselves on the second line, with one line below and one above us. Another tunnel and we looked down upon the two lines we had just passed over. A few miles further up the gorge the other two loops were made. We had, in the bewildering darkness of the tunnels, made four complete circles.

The great tunnel is nine and one-fourth miles long, through the very heart of Mt. St. Gothard, the peaks of which tower 6,500 feet above. It is the longest railway tunnel in the world, being one and one-half miles longer than the Mt. Cenis tunnel. It was formally opened in the spring of 1880, having been nine years in course of construc-

tion. With its opening was broken down nature's mighty barrier, which had ever separated central Europe from the sunny land of Italy. It stands a grand monument to the great engineer, Louis Favre, whose energy and skill led to its successful completion. In constructing the tunnel, work was commenced at each end. The perforators used were driven by compressed air, the exhaust furnishing good ventilation. The air was compressed, and held in immense reservoirs at the entrances, by pumps driven by the water power of mountain torrents. Favre died in the tunnel only a few months before the last thin barrier which separated the north from the south was pierced.

Geschenen is at the northern entrance to the tunnel, where twenty minutes were given for dinner, after which we began the descent. Near the little town of Wasen the road doubles itself twice, and makes one loop. Here it seemed that we were making no progress, as one little church remained in sight for nearly half an hour, below us one moment, behind us the next, then ahead and lastly above us.

On downward we rushed, over foaming torrents and across yawning chasms, with the glorious snow-clad Alps around us, above us and below us. One is in a continuous state of excitement; windows are all down, regardless of the cold, heads out and eyes drinking in the wondrous beauty of the scenery. A finer day for the trip could not have been chosen, clear and bright, with no clouds to hide the summits of the peaks.

We next reached the pretty little village of Fluelen, nestled among the mountains at the head of Lake Lucerne, which is said to be the most beautiful and romantic lake in the world. The water of the lake is very clear, with a peculiar blue tint, said to be produced by the shadows of the lofty mountains which surround it.

We remained over night at Fluelen that we might go by boat to Lucerne next morning. In the late afternoon we walked to

the galleries of the Axenstrasse, an artificial road hewn out of the perpendicular cliffs which bound the lake. The run down the lake the following morning was pleasant, past Tell's chapel and a monument to the poet Schiller. The day was cloudy and we were disappointed in not seeing the summits of the Rigi and Mt. Pilatus, which stand on opposite sides of the lake, like grim sentinels guarding the approach by water to the great mountain pass.

### Some Phases of the "Delightful Task."

W. D. GROESBECK, DELTA TAU DELTA FRATERNITY.

In this fragmentary record of a vacation's work, with the duties, pleasures and discouragements it involved, it is far from my purpose to write didactically. Normal schools, teachers' associations and institutes, volumes on pedagogy, psychology and methods of teaching cover a field in which it is not my design to trespass. Rather let me, if I can, give a glimpse of "School as she is Taught" in the average district of our State.

During the last few years the progress in many, in most, such schools has been rapid; but the influence of our parents' school days is not altogether a thing of the past. Young teacher, wherever you are, rest assured that your efforts to introduce State Normal plans, Normal methods and the paraphernalia of the modern school, are freely discussed in all the homes of the district and are not always overwhelmingly approved.

"But to our tale." A letter to the director of District No. —, brings the reply, couched in English fearfully and wonderfully indited, that no teacher has been engaged, and the applicant is asked to name his terms, a thing which he does with secret misgivings lest he may have aimed below the voted salary, to his own loss. Vain thought! A second "cipher dispatch," finally interpreted without a Rosetta stone, informs him that the district fathers have decided that it

will be a gross waste of public funds to pay within five dollars a month the pittance he asked. A hasty refusal, a sober second thought, prompted perhaps, by a longing for home, a torn letter and another in its place, and the Rubicon is crossed. The contract reads that the director, in behalf of the district, shall keep the building in repair, furnish the necessary fuel, etc., etc., but between the lines is the understanding that the teacher shall sweep the room, have a fire built each morning by 8 A. M., and stuff his own cap into the back window when the kid nearest it complains of a draught.

Then comes the first day. The previous teacher (may she speedily find a millionaire husband) has left programs, standings and other "psychometric land-marks," so that classification becomes easy and the round of duties is quickly taken up. Let us see what a week will bring forth.

Its close gives ye pedagogue the mental stature of his pupils and glimpses at the moral. The fifteen-year-old prototype of John L. swaggers up the aisle, wearing rubber boots, a flaming tie and a smile that challenges, if it does not command, favorable comment from the big girls. And he gets the desired recognition. The blooming miss in gold-braided jacket and abbreviated skirts, glad of the notice of any male specimen of the genus homo, beams upon him to his heart's content. Said girl counts him her earliest conquest. Her work, as mapped for the immediate future, is school to escape housework, and parties to escape school. She practices much with the pen and always signs herself *Miss Fannie* —. This is the girl who anon wakes to the fact that she has household duties at hand without knowing for a certainty how to weigh her purchases, measure her wood, or check her grocery bills—an excellent scheme for developing faith in human nature, but not a sound one from a financial standpoint.

Then there is the cowboy. Not the fellow with high-heeled boots and wide

rimmed sombrero, but the lad whose coat is full of chaff and cow hair and whose Mackinaws and overshoes are redolent with the odor of "the kine that feed in the meadow," (when summer comes). The cowboy is habitually tardy, and expects his teacher to atone for his loss of time by giving him personal attention in the intervals between the twenty-five or more classes already on the program.

Besides these, there are the plodder, with eleven-sixteenths of an inch of osseous tissue between outside facts and inner consciousness; the boy with rodent incisors, around which his s's escape so distorted as to be unrecognizable; and last, praise Allah, the bright-eyed, eager lads and lasses who ask only to be kept busy at profitable work, and who absorb knowledge as a sponge absorbs liquids.

These are a few of the types—not always the same in each district, but one or more sure to be recognized by every "wielder of the birch and rule."

And what of the attainments of this throng? Listen while a nine-year-old fairy, of 115 pounds avoirdupois, interprets her Second Reader. Her teacher, anxious that she may grasp the idea, pilots by reading of George's cat: "How is it that you can climb to the very top of a tree, when a dog cannot go up at all?" She begins: "Why is it that chew can go upatree (one word), that a dog cannot do up atall?" She reaches equally astounding conclusions in numbers and in spelling. According to her revision,  $2 \times 7$  is as apt to equal 0 as 14; and "chnng" is the hieroglyph which to her represents "shining."

From the same corner of the district comes another of like calibre. An afternoon's study on the abbreviation 'twixt, does not prevent him from writing it *t'wxit* when the spelling class is called. In geography he never gives an answer any more definite than "I think it c'mmences with R." His arithmetical processes, also, are a study for an Egyptologist. His long division runs thus:

$$\begin{array}{r} 14)8288(41812 \\ \underline{56} \\ 26 \\ \underline{14} \\ 128 \\ \underline{112} \\ 16 \\ \underline{14} \\ 28 \\ \underline{28} \end{array}$$

and he rests confident with his result because "it comes out even."

These are but a few of the clouds that shadow a teacher's path. Rude sports, ruder speech, fights among the boys, sarcasm and tears among the girls, and possibly the black blot of obscurity are sometimes his to deal with. Every child must follow, as did his progenitors, the rough path from animal nature to humanity, and so, no doubt, it will be till the millennium. But every cloud has its sunlit side as well as its dark. To feel that he is furnishing wholesome food to hungry minds, that perhaps, amid his responsibilities, he has avoided some errors of his former work and given some human soul an impetus which shall not cease 'till it grasps its handful of the pebbles of truth; these are the thoughts "without money and without price," which make the pedagogue's pittance more desirable than the capitalist's coupons, and his pupil's half-expressed thanks as acceptable to him as commendatory editorials or the applause of listening senates to the statesman.

"Though outside the pearly portals,  
He may stand with other mortals,  
Waiting doom,  
If a pupil's praise be his  
He shall bear one ray of bliss  
To his gloom."

We are pleased to notice a short article in the "Acta Victoriana" entitled "The Aims of a College Debating Society" which needs the praise of every student who looks upon debating as an essential element in developing that faculty which makes a student a ready thinker, a close analyzer of the subject under discussion, and a correct speaker.

## SCIENTIFIC.

**Influence of the Geology of a Region upon its Agriculture.**

The occupation, language, habits—even the thoughts and lives of men are largely influenced by the geology of the locality in which they live.

Is it an anthracite region? Then all their conversation is of slopes and levels, of breaking and blasting. Is the coal bituminous? Then it will be of coke, and the ovens will light every hillside, and near by we shall hear of petroleum and natural gas. Is it gold? Then placer mining, quartz and prospecting will engage the full attention. Do any of the metals or minerals that men call useful or precious lie hidden in the earth beneath us? Then we will hunt them out, and the business will fill our days and our lives, and our habits, our conversation, our very physique will unerringly indicate our occupation, and the geology of the locality in which we live.

Is the wealth not deep down but at the surface, in what grows naturally upon the soil? It is none the less varied, and none the less dependent upon the geological formations. The earth is none the less a mine of wealth.

Is it sand? Then in the great Northwest we shall hear of white pine forests, of logging roads, of booms, of gang-saws and of immense fortunes. On the southern sands it will be of the yellow pine, of turpentine and rosin and tar, and further on of oranges, pineapples and bananas. Among the hills it will be hemlock, and in the swamps, cedar and cypress. On the grassy prairies you will hear of herds and ranges, of brands and "round ups," and later of wheat and corn and hogs. Visiting in turn these various sections, it is like visiting as many worlds, so totally different is everything—the aspect of the country, what grows upon it, the industries and character of the people—all due to geological differences.

It must not be overlooked that climatic conditions largely determine the character of the natural vegetation of a particular locality, but it is also true that the geological character of the region may be greatly responsible for its peculiar climatic influences.

Further, every observer has noted the radical change in vegetation following ab-

ruptly upon a sudden change of soil, all within a limited area, subject, practically, to the same climatic conditions. For example, note the sudden change from beech to maple or from scrub oak to elm or other rich land timbers, not to mention the definite line between grass and timber at the margin of a prairie. It is useless to multiply examples on a point of such common observation.

On the other hand similar soils in widely differing climates will support identical, or very similar, forms of vegetation. Both northern and southern sands are covered with pines, and very close relatives, botanically. Through what a range of climate do we find the walnut, but how similar the soils.

In brief, differences due to climatic influence are much less, botanically considered, than are those following great differences in soils; that is, the variety in the natural vegetation of a region is mainly due to differences in soils.

Agriculture as a business aims at the production of a limited number of plants of high value as food for man or his domesticated animals. It is to some extent artificial, and covers the land with plants not native. By unlimited use of fertilizers as in market garden conditions the natural influence of soils may be almost entirely overcome, and the poorest soil be made to produce whatever the climate will allow. But this is done at great expense, and the soil serves only as standing room for the plant, and is little more concerned in plant production than is the cattle stall in the production of beef.

Under agricultural conditions the general and natural law holds good, viz., that the product of a soil depends upon its nature. In a future article I will show the extent of this principle and its influence upon agricultural operations. The soil, wherever worked and for whatever purpose is a mine of wealth as truly as is one of coal or iron. The farm is no exception.

EUGENE DAVENPORT.

**Koch's Consumptive Cure.**

The very great frequency of consumption, and the alarming fatality of this disease, make aught concerning it of the greatest interest. This is why the announcement that Koch, a very able and distinguished German scientist, had discovered a specific

for the dread malady, caused such great and wide spread excitement all over the civilized world. The very fact of Koch's well known candor and ability served to increase the interest, and strengthen the hope that the remedy was not only more than its discoverer ever claimed, but all that could be desired. Koch's only claim was that the remedy had cured cases of lupus—where the tubercular attack is in the skin—and had produced, to say the least, favorable results in cases where the bones and joints were the seat of attack. The material which Koch uses is a glycerine extract of pure cultivations of the specific organisms that produce tuberculosis. He has not given the media in which the cultures are produced. This substance is injected sub-cutaneously into the circulation, usually on the back between the shoulders. The lymph is a brownish transparent liquid, and is so active that only a dilute mixture is at all safe. It is found that .25 ccm. injected into a non-tuberculous person causes a fever, labored breath, coughing and nausea. The injection acts quite differently upon tuberculous and healthy persons, even .01 of a ccm. will produce nausea, coughing and fever in a consumptive; it has no effect whatever on a well person. Thus the best use of this new treatment may be to enable the physician to rightly diagnose this dreaded disease in its early stages.

That lupus, and tuberculous affection of the bones and lungs, have been helped and even cured when taken in the early stages, is confidently claimed by several practitioners. That other cases have not yielded to this specific is certain, and there is record of several cases where treatment has seemed to hasten death. Koch himself asserts that his lymph does not kill the bacilli, but only destroys the tuberculous tissue about the germs, so that it and the germs are thrown off together. Right here Prof. Virchow, the celebrated physiologist of Berlin, throws some very cold water on this new cure. He has dissected several subjects where death has followed treatment and claims to have found evidence that the tissue and germs are spread in the body by the injections of the lymph. Thus we see that great uncertainty at present hangs about the whole matter. While some claim cures, others are certain of injury, and Virchow suggests a possible, even probable, cause for alarm.

Whatever the outcome of this matter, we are sure Koch has discovered the true cause

of consumption in the tuberculous bacilli, and that if he has not found a cure in his lymph he suggests a very promising field for investigation. If it is proved that this treatment is safe, it will probably take second rank as means to stay this frightful disease. The great relief given by certain climates is well known. Incipient consumption is often cured by residence in the South and in California—regions where the mild pure atmosphere seems to loosen the grip of the malady. It is also a comforting fact that in the investigations often made in autopsies many cases are found where a once tubercular patient had wholly recovered. There are yet evidences of the old disease which are unmistakable, yet no evidence of any recent injury from it. Thus there is hope even for the tuberculous patient.

A. J. COOK.

### Cure for Tetanus and Diphtheria.

Two Berlin bacteriologists, Behring and Kitasato, well known as investigators in Koch's laboratory, have recently announced cures for both tetanus—lock-jaw—and diphtheria. These diseases are now known to be caused by microbes, the same as consumption, typhoid fever, etc. The cure seems reasonable and suggests that other infectious diseases may yield to the same kind of treatment. It is well known that persons once recovered from such diseases are more or less immune, and it is presumable that the blood is likewise rendered proof against subsequent attack. Thus these investigators have used the blood of animals which are immune, successfully, to prevent the disease, even though the animal were inoculated with virus that otherwise always causes the disease. They state that fresh blood or the serum are alike effective. Blood from animals not immune is not protective. These results are thought to be very valuable as they promise a cure of two of the worst diseases known to man.

A. J. COOK.

### Natural History Society.

At a meeting of the Natural History Society, March 2d, the following interesting articles and talks were presented. Mr. J. W. Toumey first gave the results of a study of the wheat kernel. In conjunction with his talk some very fine drawings were ex-



hibited, illustrating the different points. Mr. Toumey said: "To study the anatomy of a kernel of wheat it is necessary to soak it for some time in water, that the various coats or coverings which enclose the starch of the kernel may be separated from each other.

"The outer layer or epicarp consists of from one to four layers of cells extending lengthwise of the kernel, the cells toward the center being two to four times as long as broad, with walls rather thick, irregular, and generally pitted. Toward the base and tip of the kernel the cells of the epicarp are shorter and smaller. At the tip a number of small, simple, pointed hairs arise from this layer. Just beneath the epicarp is the inner layer of the pericarp, termed by Strasburger the chlorophyll layer. The cells of this layer extend around the kernel, and are several times as long as broad. It consists of but a single layer of cells, with walls nearly twice as thin as those of the outer layer, and densely pitted. In these cells the nuclei are easily seen. Beneath this layer are a number of irregular canals which form a network of openings. Next to this comes the testa, which is quite difficult to separate from the inner layer of the pericarp. The cells of this layer are somewhat diamond shaped, extending diagonally around the kernel walls which are very thin and easily ruptured. Following this is a thick, strongly refractive white skin, which, in ordinary seeds, would be known as the tegumen. The office of this coat is to protect the starch and aleurone of the kernel. From the above description it is discernable that these various layers, with the cells of alternating ones extending in different directions, are adapted to secure great strength and firmness.

"Underneath the described layers is a dense heavy layer of endosperm cells, densely packed with aleurone, and next to these come the cells of inner endosperm filled with starch."

This was followed by a talk on one of the Marsupialia, by Mr. H. B. Baker. At the close of his remarks Mr. Baker exhibited a live female opossum, as an example of this anomalous sub-class. Mr. Baker said: "The sub-class Marsupialia includes many species, the greater number of which are found in the tropics. They vary greatly in size, some being as large as a cat, while others are as small as a mouse. The opossum

(*Didelphys virginiana*), is the only member of this sub-class found outside of Australia. It inhabits America from the United States to Patagonia. It is the largest Marsupial, and is distinguished from the others by having the great toes of the hind feet opposable and without a nail, and by their dentition, the dental formula being, I., 5-4; C., 1-1; Pm., 3-3; M., 4-4. The opossum has a long nose, small ears, coarse hair and short legs. The tail is long, destitute of hair, and is prehensile, being used by the opossum as a monkey does its tail. The food of this animal consists of fruit, eggs, insects, and so forth." Professor Cook asked how long the young were in the pouch. Mr. Baker replied, "three inches" (great applause from the gallery). Several interesting observations were made concerning the opossum, it being stated that at one time this animal was very common in Michigan, but during late years it had become quite rare.

Mr. C. F. Baker then presented some observations on the oviposition of certain plant lice. Mr. Baker said: "The eggs of four species of plant lice, white pine, spruce, viburnum and willow, were examined. In each case they were oblong-cylindrical in shape, and shining black in color, ranging in size from that of the white pine plant-louse, which is about two mm. long, to that of the viburnum louse, which is about one mm. long. They were fastened to the plant by some adhesive substance.

The eggs of the white pine plant-louse were deposited on either of the two inner surfaces of the needles, usually nearer the top than the base. They were placed regularly end to end, and from five to fifteen on a needle. The eggs of the spruce plant-louse were found in a similar situation, being placed on the inner surface of the needle. In this case, however, they were very scarce, the few affected needles having only from one to three eggs.

The eggs of the willow louse were deposited in the crease between the bud and twig. In most cases they were placed end to end, like those of the pine plant-louse. Occasionally the ends would overlap, while in a few instances all regularity and order were departed from, the crease being completely filled with the eggs, which were placed in all sorts of positions. The eggs were fastened either to the twig or to the bud scale. The reason for this can hardly be explained, as at

the time of these observations the scales on certain species of the willow were falling, carrying along any eggs fastened to them. The young from these eggs would thus immediately perish, although some might again reach the tree. The eggs of the viburnum plant-louse were deposited in the same way as those of the willow plant-louse. In this case the crease between bud and twig was much deeper, the eggs, few in number, being fastened at the bottom, and both to the bud scale and the twig. It would depend on the strength of the fastenings, whether or not any of the eggs were carried down with the scale." The different situations of the eggs were shown by means of drawings.

Mr. C. F. Wheeler then read a very interesting letter from Mr. C. K. Dodge, of Ogden, Utah, which gave an account of some very interesting observations on the beaver, which that gentleman had made while in connection with a surveying party. It read as follows:

"One year ago I made some observations on the workings of beaver, and will relate them, so far as they seem to me interesting. My observations extend over a space east and west of 150 miles in eastern Utah and western Wyoming, while assisting to survey a railway line between Ogden, Utah, and Sioux City, Iowa. The workings of beaver can be found on all the creeks and in all the canyons of this country, and those wonderful animals are not yet all exterminated in the West as in Michigan. In an article written on the subject of beaver dams, I saw it stated that beavers always built their dams according to the best established engineering principles in respect to form and strength; that they were always arched up stream so as to be strengthened rather than weakened by the force of the current, and it was even stated that engineers first learned the true principles of building dams from observing the workings and structures of beavers. Not believing that most beavers had taken a course in mathematics, or that they could even demonstrate the first proposition of Davies's Legendre, and being in a country where they were a few years ago very numerous, I was determined to see for myself, and hence investigated every dam I could find. As to their form, I usually found them arched up stream, especially in narrow and swiftly flowing ones. This was occa-

sioned, it seemed to me on observation, from the fact that they probably began to build from the sides of the creek, and they would necessarily build with the curve or arch up stream in order to keep their material from washing away. It seems to me an animal would do that without having in mind the fact that the arch was stronger than any other form. In any event, these curves, in narrow and swift streams, are quite perfect as far as the eye can detect. When a dam is across a stream from fifty to one hundred feet wide, I find them in all shapes, even with reversed curves or diagonal to the stream, and often turning from point to point, as they could best find points against which to lodge material. On one of the branches of Lost Creek, within a mile I saw ten dams from fifty to one hundred feet long, sometimes three feet high, built mostly of sticks, leaves and moss, and strong enough to withstand a very swift current. In Weber Canyon, within twenty miles of Ogden, I saw one freshly made of stones weighing from two to five pounds, sticks, mud, sod and leaves. The sticks had been freshly gnawed in two, probably within a week of the time I saw it, which was in December, 1889. At one place in Weber Canyon, I counted eighteen trees recently gnawed down by them, some being eighteen inches in diameter. The tree gnawed was *Populus angustifolia*. Sometimes they go up three hundred feet on a mountain, gnaw down *Populus tremuloides*, and cut it into pieces three and four feet long and drag or roll them down into the creek. I noticed this in many places. I have never seen any houses or evidences of them, of which I have read in books, but looked for in vain. On a dry branch of the Little Muddy River in Wyoming, a well three feet deep and perhaps two and one-half feet across the top, was dug in the bed of the creek. In the well the water arose about one and one-half feet. During the night a beaver fell into it and could not get out. This surprised me not a little, as I supposed such an ingenious animal would dig out. But it seems the water buoyed him up so that he could not stand solidly, and instead of trying to dig out, he put his fore feet against the sides of the well and tried to climb out, the same as any animal not used to the water would have done. The marks on the sides of the well indicated that he had tried in no other way. However, the novel situation may have scared him out

of his wits, the same as happens to many human beings when in unusual troubles. I notice that beaver dams are always well made, even as well as we could make them with the same material." A number of observations were made on the beaver, one of which was that the beaver is even now rarely found in Northern Michigan.

The remainder of the evening was given up to general observations. Many interesting facts were presented and discussed.

C. F. BAKER, Secretary.

### Mechanical Club.

At the first regular meeting of the "Mechanical Club" for this term, held in the lecture room of the Mechanical Building, the following program was presented:

First a reading by Mr. A. F. Stow, entitled the "Pennington Air-ship." This so-called air-ship is now on exhibition in the Chicago Exposition Building, and at intervals of one-half hour it is "turned loose," and floats majestically around a small circle in the calm atmosphere of the building. It sails about as fast as a man can walk. It is held by an electric wire which conveys the motive power from a dynamo on the ground, and when this exhibition is over the ship is pulled down with the thumb and fore-finger. It is claimed by the inventor to be a grand success.

Following Mr. Stow came Mr. G. A. Hawley, who presented an essay on the hardening of steel, in which he put forth the general properties of steel, and explained the different methods of tempering it.

Next came a very interesting talk by Mr. Van Devort on his trip through Great Britain. He visited large shops in Glasgow, Dundee, Newcastle, Leeds, Bradford, Manchester, Sheffield, Derby and Birmingham. In most cases he was received kindly and shown through the shops in the most cordial manner. He says: "The machines in these shops do not present the elegance of design that the American machines do; also that machines and tools of American manufacture are by no means strangers in those shops."

The last on the program was a talk by Professor Durand, on the measurement of fine lines. He exhibited and explained the apparatus which he used to measure them. It

consisted of a compound microscope, having an attachment called an eye-piece micrometer, with which he was enabled to measure the width of a line to within one-two hundred and fifty thousandth of an inch. He measured several lines drawn by members of the freshman class in mechanical drawing. The finest of these was a trifle over one-thousandth of an inch in width.

## THE SPECULUM.

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AGRICULTURAL COLLEGE, APRIL 10, 1891.

THE Wednesday afternoon exercise is a farce whenever it consists of speeches by students. It has been given out that all the students are expected to attend. But they don't attend, and what's more the faculty usually send a very small numerical contingent. If the exercise is worth anything, both faculty and students ought to attend. If the exercise is not worth attending, better abolish it as soon as possible. It is not jus-

tice to the orators to be treated as they are. Neither does it seem the part of wisdom for the faculty by their absence to assist in keeping it the farcical proceeding it is.

AT a winter meeting of the Board of Agriculture it was decided to establish a Department of Animal Pathology in connection with the Experiment Station. A competent professor is soon to be procured, and a work that no doubt will prove of the very highest value to our farmers and breeders will be undertaken. The aim is to provide facilities for investigations as to the cause, cure and prevention of dangerous animal diseases. We believe this station will be the first in the United States to establish a department exclusively for such work.

FRIENDS of the alumni, make your plans for the summer to include a visit to your Alma Mater. Remember this is the year for the alumni reunion. If you have never attended one do not let this opportunity pass for greeting your old-time friends, and learning the wonderful growth of the college since the days of your pilgrimage on the old campus. If you have attended before, come that you may help to make the reunion of '91 the best of all. Bring with you your wife, your babies, and the memories of your sophomore pranks. Come for a season of refreshing—recreation. Come that those of us who have not yet buffeted the world may take your hands and pledge ourselves to endeavor to uphold, as you have done, the fair honor of M. A. C.

SINCE our last issue some changes have been made in our Board of Editors. The representative of the Hesperian Society has been admitted to the Board in place of the representative of the Natural History Society, and there has also been some shifting of positions. While we will endeavor to keep every department of the paper up to the standard set us by our able predecessors, it will be our special aim to increase the num-

ber of interesting features in the science department, and to obtain such a class of articles for the literary department as shall induce a more general reading of that section of the paper. We would request of the alumni that they occasionally take it upon themselves to send in sketches, descriptions, reminiscences or discussions. Thus the tone of the literary department can perhaps be raised, and the general interest in the paper increased among both students and alumni.

NEAR the close of last term a joint committee from the faculty and students revised the constitutions of the Students' Organization and of the Students' Government. A number of changes were made, some of those in the Students' Government being quite important. The college was redistricted, one hall constituting a district, the district being divided into wards. Each district elects a captain residing in the district, who appoints a lieutenant from each ward, responsible to him for order in that ward. The captain in turn is responsible to the president of the Students' Organization, who is expected to see that order is maintained everywhere on the grounds. These changes make the office of president of the Students' Organization one of the most responsible in the gift of the students. The new order of things ought to add much to the efficiency of the government by students. And yet, as in all self-government, the spirit of the majority will largely control affairs. The system is quite efficient in theory. It rests with the students to make it actually so.

THE lecture system at this college has many friends and perhaps not a few opponents. In the agricultural course those studies which have most to do in making it a proper course for a college of this nature to offer to students, are taught largely by the lecture system. This method, therefore, becomes at once a leading feature of our system of instruction. But the question may fairly arise, as it does arise in connection

with nearly every institution framed by man, "Is it doing all it might do? Is it producing the highest possible fruitage?"

Now we are heartily in favor of the lecture system as a method of instruction. It seems to be especially fitted for scientific subjects, at least for those in which original investigation cannot be pursued to any great extent. (1.) It permits of a condensation of the subject matter to the foundation facts and principles, throwing aside, for the time being, the extraneous and the less important matter. (2.) It makes more possible the incorporation of the results of the very latest investigations. (3.) It enables the student to become at once and with ease familiar with the pith of the subject.

But it is a well known fact that these lecture studies are what are known in student parlance, as "snap" studies. In these, as a rule, the highest marks are made, and with the least study. Rarely a student puts more than half an hour on such studies and some men even less, yet nearly all make a presentable record. This may be said to show the superiority of the method—that it enables the student to gain easily a clear idea of the subject. We claim however, that there are at least two faults in the method made patent by the facts above noted; two faults that involve two principles of higher education. (1.) There is no particular mental *discipline* connected with the preparation of the lesson. (2.) There is not enough investigation. No consultation of authorities is demanded. There is no compelling of original investigation of authorities and authoritative sources of information, no comparison of researches or opinions. True, the student is given a chance to do the work; yet he is not compelled to do it, he is not even incited to do it, but is rather led to take things for granted.

Now is there not room for improvement, and is not such improvement practicable? Why not make the lecture proper represent only a portion of the actual labor required in the preparation of the lesson or of the knowl-

edge gained? Why not compel students to search authorities and dwell on especially interesting or instructive topics by making references a part of the lesson? We know of one professor who is introducing this method with apparent success. Perhaps others will find it practicable and helpful. In some cases no doubt a change is undesirable. But may it not be applicable in many instances? In general, it seems to us that the gains would be the following at least: (1.) More discipline in preparation. (2.) A broader knowledge of the subject. (3.) A more perfect knowledge of the subject resulting from research and comparison. (4.) A knowledge of the authorities and literature on the subject. (5.) A view of the extents and limitations of the subject. (6.) Methods of research used by original investigators. (7.) It is in harmony with the spirit of laboratory practice in vogue here. Indeed it *is* laboratory practice. And yet the ordinary laboratory work is often not enough. That represents what the students himself can see and, as such, is invaluable practice. This method would teach the student to get hold of what others have done, and is but the proper adjunct of the other.

There are difficulties in the way of a successful application of this method, and yet we believe it is worth the consideration of all who are interested in the systems of training pursued at this college.

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### COLLEGE NEWS.

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'93 or '94.—Which?

Prof. Noble and wife spent the winter with friends in Iowa City, Iowa.

Miss Sinclair spent her vacation with friends in Jonesville and Detroit.

A variety or breeds of sheep and swine are a valuable addition to the college stock.

Over a thousand new insects have been added to the college collection during vacation.

F. B. Mumford received his diploma with the degree of B. S. at the close of the fall term.

Mr. Wheeler took a trip to New York State, with a short stop at Cornell during the winter.

Director Cooke and wife, of the Vermont Experiment Station, visited the college recently.

Prof. Corbin and mother, Prof. Thurtell and Mr. Meyers were at Ann Arbor during vacation.

College receptions were held each Friday evening during the winter, at the residences of the Faculty.

One of the most enjoyable features of the term was the Easter service, Sunday morning, in the chapel.

Messrs. C. B. Cook, J. H. Larabee and H. J. Hall received the Granger's fourth degree, at Lansing, March 28.

Mr. Hiscock has resigned as engineer, and Mr. Edgerton, of Grand Rapids, has been selected as his successor.

The students and sub-faculty held a mid-winter reception in the College Chapel, Tuesday evening, February 5th.

There has been a society formed by the ladies of our college; its name is to be Feronians. Mrs. Hillman is president.

James Dalziel, who has given such excellent satisfaction as herdsman at the college, expects to return home to Southwestern Scotland.

The opossum received from Kentucky and recently exhibited at a meeting of the Natural History Society, will be mounted for the museum.

Dr. Beal spent six weeks of vacation at Cambridge, studying grasses, preparatory to finishing his second volume of "North American Grasses."

During vacation President Clute visited Columbus, Baltimore, Philadelphia, and New York in search of a bacteriologist for the experiment station.

The College Choir met at President Clute's and enjoyed a musicale under the direction of Mr. Peebles. Mr. and Miss Hutchinson, of Lansing, assisted.

The Commencement orators have been chosen, and are as follows: K. L. Butterfield, W. A. Fox, F. W. Ashton, B. A. Holden, A. R. Locke, H. B. Winegar, E. P. Safford and William Enders.

Professor Davenport was in Lapeer, Saturday, the 28th of March, looking for a team of horses for the farm department. They arrived Monday. They were purchased of Hon. John T. Rich.

Twenty Farmers' Institutes were held under the direction of the State Board of Agriculture during the winter months. They were well attended, and much interest was manifested at all of them.

Dr. Grange left for Alpena, Monday, of last week, for a four days' absence from college. During his absence Mr. Niswander conducted a series of examinations on the lectures delivered on Veterinary Science and Materia Medica during the first half of the term.

Since the fall term two hundred and six (206) volumes have been added to the library, forty-five recently bound volumes and a large number of catalogues and bulletins. The new books added are

chiefly works of history, constitutional law, and political economy.

Commencement exercises this year occur one week earlier than heretofore, as follows: Examinations begin Saturday, August 8th; Baccalaureate sermon Sunday, August 9th; Examinations continued, August 10th and 11th; Commencement Day, August 12th; Alumni reunion, August 13 and 14.

Nine hundred and twelve plants, mostly desiderata, have been added to the herbarium, coming from remote parts of the United States and Canada. The Botanical Department has also sold three hundred and seventy-five named species of grasses, which were sent to the Oregon and South Dakota Agricultural Colleges.

About eighteen hundred pounds of seed of the improved varieties of sugar beet grown in France, Germany and Austria have been imported and are being distributed among representative farmers throughout the State, who promise to plant, properly cultivate, and when grown send samples of each variety to the college to be analyzed.

While Professor Simpson was connected with our Military Department he was very popular, and as Professor of Mathematics he gained great favor among faculty and students for his efficient work. The news of his resignation was received with regret by all connected with the college. He has been ordered to join his regiment in Arizona.

Mr. J. H. Larabee, former Secretary of the Vermont State Bee Keepers' Association, will have charge of the experiments to be carried on at the Apiary during the coming season. The result of special planting for bees will be one of the experiments. Mr. Larabee comes to us with the best of recommendations, namely, success as a practical apiculturist.

Three interesting bulletins were issued during the winter—Vegetables, Varieties and Methods, Six Worst Weeds, and Beet Sugar. There has been a great demand for these, which speaks well for the bulletins. The agitation of the subject of beet sugar has led to the issue of Bulletin No. 71 by Dr. Kedzie, who is taking great pains to fully investigate the matter.

Through an accident, just as our last issue was going to press, a printer's pie was made, and our report of the oratorical contest was omitted. The contest was held the evening of October 31. The contestants were W. A. Fox of the Olympic Society; S. C. Dundore of the Hesperian Society, A. R. Locke, of the Union Literary Society, K. L. Butterfield of the Eclectic Society. Mr. Butterfield was awarded the first prize, a gold medal. Mr. Locke received a silver medal as second prize.

The officers of the senior class have been elected, and are as follows: For president, G. C. Moore; for vice-president, S. C. Dundore; for secretary, C. F. Baker; for treasurer, W. O. Hedrick, and for marshal, W. J. Breese. The literary officers are: orator, A. T. Sweeney; poet, A. C. Sly; prophet, H. W.

Mumford; historian, V. S. Hillyer; statistician, V. H. Lowe; editor of class paper, A. F. Gordon. G. A. Waterman, M. E. Greeson and C. P. Locke constitute the executive committee.

Our short acquaintance with Lieutenant Crittenden leads us to believe that no better selection could have been made of a man to take charge of our Military Department. For fifteen years he has been a member of the regular army, entering the army in 1876. His first duty was at Fort Wayne, Michigan; after two years in Michigan he went to Texas, where he remained until December, 1881, when he left to enter the School of Application for Infantry and Cavalry at Fort Leavenworth, Kansas. Two years later he graduated and was sent to Sante Fe, New Mexico, where he remained until 1888, from there to Fort Fetter, N. D., and from thence to the Michigan Agricultural College.

A joint committee of Board and Faculty has been appointed to prepare a plan for the location of future buildings.

The matter of making an especial college exhibit at the Columbian Exposition is receiving thoughtful consideration.

The State Board has been active during the past few months, and has made many needed appropriations. It has recommended that the college lands be withdrawn from the market and re-scheduled and appraised.

The Board is already considering plans for the Institutes to be held next winter, and a committee has been appointed to secure the services of a competent man to make arrangements for local programs and other necessary details.

This spring the Board has authorized the expenditure of three hundred dollars for engine and boiler testing apparatus, and also three hundred for the purchase of new wood working vises for the wood shop. These with the new benches will add much to the appearance and convenience of the shop.

Money has been appropriated for the purpose of completing the collection of Herd and Flock Books of all breeds and varieties of live stock. When secured, a student will have the means at hand of tracing out the breeding of any registered animal in America. Appropriations have also been made for the purchase of farm and garden tools.

During the early part of the winter the Board appropriated twelve hundred dollars to be used in purchasing two new lathes for the machine shop. These lathes have been bought and placed in the shop. One of these lathes has the capacity of taking in a piece twenty-four inches in diameter and twelve feet in length. The other, a Precise lathe, has a sixteen inch swing and seven foot length. The screw of the Pratt and Whitney lathe, it might be interesting to know, is just two removes from the original Pratt and Whitney Standard Screw, which had an error of one part in ten thousand. This makes the error of our machine practically two and one-half parts to ten thousand.

## 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 this department, often, thus making his work much easier and the department more interesting to all.

Ex-President T. C. Abbot, who from '63 to '85 presided over our college, has been afflicted with a disease which has assumed the form of paralysis of the brain and muscles. He recognizes but few of his friends, and is as helpless as a child. The friends of the college can but be filled with grief at this condition of its faithful friend and benefactor.

Assistant Secretary Edwin Willits has the reputation of being one of the most diligent workers at Washington. The progress of the Agricultural Department under the present administration would indicate that his labors are well directed and efficiently applied.

'61.

Prof. A. M. Prentiss and wife, of Cornell University, N. Y., expect to spend the summer in Europe.

WITH '61.

Hon. C. J. Monroe lately visited the college. At the morning chapel he narrated a few interesting historical facts about the college. As one remarkable peculiarity of those early days he mentioned the fact that there was, in '60, but one mud-puddle between the college and Lansing. Now there are several.

'62.

E. M. Preston was elected State Senator in California last fall, for his second term. His name has been given to one of California's finest institutions of learning, "The Preston School of Industry." He was the author of the bill for its establishment.

Frank Hodgman's Manual of Land Surveying has recently been revised. This is an admirable work, and is approved by mathematicians and lawyers.

WITH '62.

Ex-Supt. David Howell, late of the Lansing schools, has decided to prepare for the Presbyterian ministry. For the time that he works at his preliminary studies he has been appointed by the Presbytery of Monroe to supply the pulpit of Petersburg and Deerfield churches, Monroe county. He has been so far pursuing his special studies at Princeton.

'64.

S. M. Millard is no longer a member of the Board of Trustees of the Illinois Industrial University. He has been a member for a number of years.

'66.

One of the most prominent and responsible officers of the North Western Life Insurance Company is C. H. Watson. He was promoted recently.

F. S. Burton, of Detroit, had his home saddened by the sudden death of his beloved wife on the 4th of March, 1891.

'68.

S. M. Tracy has been appointed to take charge of the Grass Experiment Stations, which the Department of Agriculture has recently established in North Carolina, Georgia, Florida, Louisiana and Mississippi. This work will not interfere with his work as Director of the Mississippi Experiment Station.

'69.

James Satterlee is no longer assistant secretary of the New York State Board of Agriculture. This is an example which illustrates what a change may be brought about by a revolution in politics.

'70.

Hon. C. W. Garfield has had the honor of declining a position on the World's Fair Horticultural Division.

C. S. Williams, of Owosso, was the Democratic candidate for Regent of the U. of M. Mr. Williams is engaged in the real estate business.

'71.

Prof. E. M. Shelton writes President Clute from Brisbane, Queensland, Australia. He says: "You may be pleased to learn that I like the climate, the people, and the work here, and what is quite as much to the purpose, am making real progress I believe. I have been so far working for an Agricultural College, and have reason to hope that we soon shall have provided the endowment of 500,000 acres of valuable land for each of three such colleges." Mr. Shelton has given several lectures before the farmers of Queensland, and his wife is often called upon to read papers upon fruit canning, family hygiene, etc.

On December 15th, '90, the beloved wife of Byron D. Halstead died of pneumonia, after an illness of six days. He is left with two children, Claire, aged seven, and Edwin, three years old. Mr. Halstead remains as botanist and horticulturist of the New Jersey Agricultural College.

After having malaria, neuralgia, pulmonary consumption, night sweats, asthma, bronchitis, ulcer, abscess, hernia, and other less serious diseases known only to the medical fraternity, E. B. Fairfield says that he is better than a dead man yet. He expects, soon however, to be as lively as any corps--spelled without an e.

WITH '71.

C. C. Dell is at present residing at Battle Creek, Mich. He is interested in real estate, and recently made a trip to Alabama with Detroit gentlemen.

'73.

Prof. R. C. Carpenter finds himself happily located at Cornell University, N. Y. He is kept very busy, and has the satisfaction of knowing that the results of his labors are appreciated.

'74.

Dr. F. J. Groner, late of Big Rapids, is now a practicing physician in Grand Rapids, Mich.

H. P. Jenney, of St. Clair County, has been a frequent visitor at the Capitol at Lansing. He is an energetic Democrat. As he visited the college from Trowbridge, he noted the familiarity of the "Peninsular Orchard."

D. C. Oakes has sold his banking interest in Shelby, and has purchased the controlling influence in the Coopersville Exchange Bank. His family will remove to Coopersville.

'75.

F. J. Annis, secretary of the State Board of Agriculture, Ft. Collins, Colorado, visited the college late last fall. He was one of the charter members of the Phi Delta Theta Fraternity at M. A. C.

A. A. Crane recently sent to the Botanical Museum at the college, a Swiss ox-yoke. It is a peculiar apparatus used by a few of the people of his vicinity.

'76.

At the State convention of the Patrons of Industry, John E. Taylor was re-elected Grand Secretary of that organization by an unanimous vote. He is also secretary of the Patrons' Commercial Union. He has his office in the Turner Block at Lansing.

R. A. Clark has removed from Lansing to Saginaw, where he enjoys his business as much as ever.

'77.

Albert Dodge now practices law in Grand Rapids. His sentiments upon prohibition are sound, which makes him one of the prominent men of that party.

'78.

G. E. Breck has become one of the leading stockmen of Michigan. He is secretary of a prominent Stock Breeder's Association. He is an enthusiast and makes a speciality in raising and caring for Shropshire sheep and Cleveland Bay horses.

E. O. Ladd is a successful farmer and fruit grower. He was present and took an active part in the Traverse City Institute this winter.

W. K. Prudden has been chosen president of the new knitting factory of Lansing. The company has been re-organized, and has an increased capital invested. As republican candidate for mayor of his city, he was defeated.

C. E. Sumner was secretary of the Republican Club of Toledo, O., last fall, and through his untiring efforts the Toledo papers claim the success of the republican party throughout that vicinity.

'81.

Arthur Jones, a lawyer of Muskegon, made the college a short visit while spending a few days in Lansing, where he was keeping his eye on the Legislature.

E. C. McKee read an interesting article on "The



Silo" at the Farmer's Institute held at St. Johns last winter.

C. D. Phelps is now a farmer and fruit grower in Grand Traverse County, Michigan.

'82.

There has been built a new laboratory for the Michigan Carbon Works at Detroit, which W. L. Snyder is superintending.

'83.

H. W. Collingwood, assistant editor of *Rural New Yorker*, writes some fine poetry, showing how the "farmer lad," in the city, "gets there."

W. H. Bahlke was the hustler and principal manager of the Alma Farmers' Institute. The Institute proved to be the best and most successful of any ever held in the State. Reader, you can draw your own inference.

C. M. Weed has been tendered, and has accepted, the position of Professor of Entomology in the Dartman College. He has also the charge of the experimental work of that department of the experiment station.

'84.

C. P. Gillette has severed his connection with the Iowa Experiment Station, and has accepted the professorship of entomology in the Agricultural College of Colorado.

R. J. Coryell and Miss Mabel C. Bowen, married, March 25th, 1891. Home, South Allen, Michigan.

WITH '84.

Stone, the "Light of '84," made M. A. C. a call not long ago. He is a farmer at Almont.

'85.

T. D. Hinebaugh, of the Veterinary Department at Purdue University, Indiana, has been chosen Professor of Veterinary Science at the Agricultural College of North Dakota.

James Dart has opened a law office in Cheboygan.

P. G. Tower, electrical engineer at Canton, Ohio, and Miss Ida May Smith, of Lansing, married January 15th, 1891.

J. D. Tower left M. A. C. the last of March for Kingston, R. I., where he is employed as assistant agriculturist in the Experiment Station there.

The *Corvallis Gazette*, of January, publishes an outline of the work done by Prof. H. F. French, of the Oregon Agricultural College. *In toto*, it consists in the practical application of the principles taught in the class room.

Glen C. Lawrence is teaching school at Williamston, and writes to be enrolled as an applicant for an M. S.

'86.

Fred C. Davis, a civil engineer in San Francisco, Cal., took unto himself not long ago, a wife, to share his good fortunes.

C. F. Lawson is County Secretary of St. Clair county. This is his second term. Salary, \$1,500.

'87.

A. A. Abbott is studying at the State Mining School. Until recently he has been managing his father's farm.

Harry W. McArdle, teacher in the Marlette High Schools, reports plenty of work and little spare time.

J. C. Duffey, Entomologist at Shaw's Gardens, St. Louis, Mo., spent part of his last winter in Cornell University, studying entomology, and completed his work at M. A. C., where he concluded he found more and better advantages for study than at Cornell. His work at the Gardens has been exceedingly valuable. He is assisted by his wife, who, being an artist, makes drawings for his publications.

'88.

H. E. Harrison is employed in the chemical department at the college.

The Superintendent of Public Instruction of the State of Nevada writes of the work of F. H. Hillman in a complimentary manner. He maintains that the experimental work and investigations in entomology are most beneficial and economical in their results.

Geo. Teller has been changed from Professor of Chemistry in the Arkansas Industrial College to chemist in the experiment station.

On the 14th of March L. H. Dewey and wife, of Washington, D. C., entertained at dinner Secretary and Mrs. Willits, W. A. Kinnan ('86), C. L. Himebaugh ('87), W. F. Staley ('88), and W. A. Taylor ('88). The occasion was the anniversary of Mr. Dewey's birthday. The reunion brought out many reminiscences of events in college life that had well nigh been forgotten.

W. A. Taylor has a position as pomologist in the Agricultural Department at Washington, D. C. In the civil service examination he so far out-did his competitors that they were not affected by his dust. He writes that the important feature of his work is the identification of specimens and the preparation of bulletins.

W. M. Munson is no longer at Cornell. He has been chosen Professor of Agriculture in the Agricultural College of Maine.

'89.

W. E. Rohnert is prospecting in California with a view to locating.

G. J. Jenks is employed as shipping clerk for the firm of J. Jenks & Co., Sand Beach, Mich.

Geo. S. Flower, for the past two years, has been on the land survey in Kentucky. He expects to go to South America next year with N. W. Duffield & Sons, to survey a new railroad through U. S. Columbia.

F. N. Clark is billing freight in the Ludington dock office of the F. & P. M. R. R. He has good hours, good pay and good prospects for the future.

WITH '89.

Geo. W. Angier is assistant manager of the great Western Electric Supply Company, Chicago, Ill.

Chas. M. Hemphill is secretary of the Ypsilanti Loan and Investment Company.

T. R. McCure has taken a civil service examination. But he has been advanced in the present position, and now ranks next to the head clerk for the Michigan State Board of Health.

'90.

R. B. McPherson left the U. of M., and is engaged in a bank at Howell.

Frank Clark was a democratic candidate for a member of school board in Lansing.

W. Babcock, Jr., is teaching in the High School at Milan, Michigan.

B. K. Bentley left Lansing, February 25, for Denver, Colorado, where he is engaged as book-keeper for Knight & Altmore in their clothing house.

Joe Freeman is foreman in Bass's machine factory of Grand Rapids.

WITH '90.

N. C. Smith is partner in a publishing house in Chicago.

James Hooper, of the State Mining School carries with him 235 pounds of substantial material, which mass exerts its energy in the rush-line of Houghton's foot-ball team.

E. J. Frost is draughtsman for Black & Clawson, manufacturers of paper mill machinery at Hamlin, Ohio.

WITH '91.

Will Cannon is at South Pines, North Carolina, where he is still recruiting. His health is improving.

Fred Stone is private secretary for Auditor General Stone at the Capitol. Fred is a hustler and sticks to business.

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## ATHLETICS.

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### A Few Hints on Training.

E. H. POLHAMUS, INSTRUCTOR IN GYMNASIUM.

In view of the approaching M. I. A. A. Field Day, and inasmuch as there are very few among our members who take no interest in the same, there being many who wish to participate in the sports of that eventful time, it might not be out of place to speak of training which a man should undergo to become an athlete, or being an athlete, should take to fitly prepare himself for his contest.

First and foremost late hours and consequently late meals should be scrupulously avoided, as should also all stimulants and narcotics. In other words one should have at least two hours sleep before midnight as those two hours are worth more than four hours after midnight, owing to the change in the electric current. Then again no evening lunch should be

eaten. It will overwork the stomach, which will have all it can do, to properly attend to three regular meals a day. And last

DO NOT "DRINK,"

or smoke at all and do not use spices to excess.

Careful attention to the foregoing will at least keep the body in as good condition as it now is and you will not have to build up tissues which are as continually being broken down by the indulgence of pernicious habits.

Having decided to become temperate, you may begin your exercise by taking a daily walk of from two to three miles at a brisk pace, two hundred yards of which may be covered at a "dog trot," to use a common expression; or if time and place be insufficient for the walk, as is too much the case here, a steady trot of three quarters of a mile a day or thereabouts will give a "green" man sufficient exercise for the nether limbs. In addition to the running a five minutes "go," arm and neck exercises with the dumb bells are strictly necessary, while one whose shoulders seem to be "bound up" may advantageously take a few minutes turn at the pulley machines or with the Indian clubs. This vigorous exercise of the extremities tends to produce what is known as

"OXYGEN HUNGER."

That is the amount of oxygen supplied the blood becomes insufficient to support the active tissues and we must devise some method of remedying the difficulty.

It is well known that the lungs can be made to do all the work that is necessary they should do. Consequently after a few days' exercise with the extremities alone, dumb-bell movements for the shoulders, chest and abdomen should begin, in no wise slacking the work before begun. In addition to these, breathing exercises should be daily practiced, thus increasing the capacity of chest and air area of the lungs. This will afford a sufficient amount of purified blood for use in the building of the muscular tissue.

No matter for what one is in training, he should never overwork one part of his body at the expense of another. If he is a jumper, his neck, shoulders and back ought not to be slighted while his thighs are being muscled. If a runner, the same applies, while a boxer, fencer, weight-thrower or "bar-man" should see to it that his legs receive as careful training as do his trunk and upper extremities.

Another of the important things to be remembered in training is this. Never suffer yourself to "cool off" after your work.

As soon as the daily walk and exercise is over the body must be thoroughly dried

AND RUBBED DOWN

with a coarse towel, after which the flesh should be well slapped to promote circulation and toughen the skin.

Moreover a "polish bath" should be taken upon rising in the morning and before retiring at night, the

flesh simply being rubbed briskly with the towel, no water being used.

A bath ought to be taken once a week and *only once* unless there be some exceptional excuse for more.

When taken it should be of warm water, immediately followed by a dash of cold water to quicken the circulation which the warm water has tended to decrease. No bath or exercise should be taken within an hour and a half of meal time, before or after.

The limits of this article forbid a fuller discussion of the subject, but sufficient has been said to place the athlete upon the right track and we trust he will avail himself of the same.

## Harvard vs. Yale.

Dr. W. J. Beal has kindly contributed the following concerning the celebration of the great game of football between Harvard and Yale last November. The Doctor spent most of his vacation at Harvard and was one of the many witnesses of the game.

The management of athletics at Harvard has made the faculty no end of trouble. Sporting has been carried to great excess, often occupying more than half of the time and energy of many students. The University has a fine gymnasium with a professor to superintend and advise the students. Here they practice with various kinds of apparatus, especially in inclement weather. Large squads, accompanied by a trainer, may be seen at evening in training costume on double quick, up and down the sidewalks of some of the aristocratic streets. For base ball the ordinary suit is cut much like the one adopted by the club at M. A. C., only it is perfectly plain and white, or was once white. When the weather is a trifle moist, the costume soon becomes anything excepting gay in appearance. The material much resembles that used for making bags, such as farmers use for marketing grain.

As all hands returned from Yale Saturday night, tired and hoarse, the celebration was on Monday night following. This gave the Sunday morning papers of Boston an opportunity to display their skill in illustrations and editorials and head lines. Here is one: "Bravo, Harvard! Two goals to Yale's one—12 points to 6. A better game was never played, and 20,000 persons saw it and cheered. Harvard was in it from first to last. The crimson half-backs did more than their share. Dean ran 80 yards with all Yale after him, and Lee and Corbett made telling gains. The work was clean but very exciting. Harvard won from Yale only once before." For the first time since 1875, in fifteen years. The game was played in Hampden Park, Springfield, Mass.

On Monday night, about eight o'clock, the streets of Cambridge were lively. A fine, old-fashioned coach, drawn by four fine horses contained the victors. Following this was a long procession of students, small boys, and others interested. Students all wearing office gowns, old hats and good hats. Many carried horns and squawkers, pitched in all keys. The sounds,

in a certain sense did not harmonize, yet in another sense the crowd was all in harmony with Harvard. Crimson is the Harvard color. Large flags and small flags, badges, gowns, aprons, were crimson. Every little way in the procession men were adding something to send up a crimson flame. Crimson flames were displayed in front of many shops. Every rod or so shouts and "'rah, 'rah, 'rah," in concert enlivened the scene. Two or three brass bands added to the din and racket. Like a large serpent the procession threaded its way through and through the streets and the college campus, in the meantime calling at the President's house for a speech, then to the play-ground. They finished up, at least so far as out-door services were concerned, by burning a lot of cord-wood and other material saturated with oil and kerosene. The fuel was furnished by the University students, who were complimented the next day for not burning anything else. In the shop windows for a month after were displayed numerous cards, such as is now posted on the bulletin board of College Hall.

## Notes.

The term has opened and the boys appear to be quite enthusiastic over the coming Field Day. The ball team has not been completely organized as yet, but has elected Lieutenant Crittenden as manager, and F. W. Ashton as assistant manager. Most of the team have returned, including our famous battery, Burnett and Wilson; but the vacancy caused by Rob Gardner's not returning to college, is one that will be hard to fill, although he promises to be with us field day. There is some good material in the incoming freshman class, and it is believed, with a little practice will help to strengthen the team wonderfully. In regard to practicing, the assistant manager should appoint certain practice hours in each week, and the players should take enough interest and pride in the welfare of the team to present themselves for that duty at the time appointed. If the practice is not kept up the team will be in worse condition than it was last year.

Mr. Polhamus has kindly consented to train the boys in the gymnasium. He has organized a class in boxing and one in physical culture, and he will gladly assist all others who wish to train for anything else, as much as his time permits. His ability as a trainer and instructor in athletic sports is well known, and the boys will make it easier for him by turning out regularly for practice at the time he appoints.

A. C. Sly will represent M. A. C. on the M. I. A. A. Board of Directors. He was elected to fill the vacancy caused by J. L. Potter's not returning to college. The first meeting of the directors is to be held at Jackson, April 11.

At a recent meeting of the Students' Organization it was resolved that "it be the sentiment of the Organization that the Normal school be admitted to the M. I. A. A."

## COLLEGES.

England has but one college paper.

In the University of Michigan, seventeen per cent of the students are women.

The number of colleges and scientific schools in Brazil is forty-five; Canada has forty.—Ex.

Out of the 867 lady graduates of Vassar College, only thirty one have married. Boys, don't be discouraged.

The University of Leipsic has this year been opened to ladies. At present this is the only German University admitting ladies.—Ex.

Students who use tobacco in any form are denied admission to the "University of the Pacific," San Jose, California.

There are thirty-seven Japanese students at Ann Arbor.—Ex.

The mineralogical department which Harvard is soon to have, contains the finest collection of meteorites in the world. The value of this portion of the collection alone is estimated at \$1,500,000.—Ex.

Co-education seems to be a grand success in the Missouri University, the number of marriages and engagements between the male and female students being forty at the latest count. Prof. Cupid has evidently been given a chair there.—Ex.

## EXCHANGES.

"The Civilization of the Anglo-Saxon" in the Baker University *Index* is a well written article.

An article in *The Campus* entitled, "The Method of Culture" ought to have begun the issue. It is full of thought.

The highest standard of pure journalism consists in being explicit, expressing the best thoughts in the least number of words and lastly correct spelling and abbreviating.

Students! remember these words as quoted from the Colby *Echo*:

Of all the words of lad or lass  
The saddest are these, "I did not pass."

The editor of "*The Echo*" is behind the times regarding the enrollment of students in the University of Michigan. Instead of 2,100 students, the attendance at present is over 2,400. This has the largest attendance of any school in America.

The March number of "*The Owl*" has quite a number of interesting articles, among them are "The Love of Art," and "Influence of Fine Art."

We notice that most of our leading college papers are up to the standard. Few of them are lacking clearness of thought in their literary productions. There is, however, abundance of proof that each one is trying to do his part in bettering the condition of literary excellence.

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