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VOL. I.

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AT DAY-BREAK.

When the rosy blush of morning
Sends afar its 'raptured warning
Of the melodies of birds,
I betake me to the meadows
Where the long and dewy shadows
Rest aslant the fragrant woods.

Where the golden stairs of sunlight
Melt the timid, mellow moonlight—
Kiss so sweetly brook and fern,
'Till the rill, with sparkling laughter,
Seems to bode some glad hereafter
Ecstatic with celestial morn.

Freshly wave the dewy grasses
With the breeze that coyly passes
Bathing gently ev'ry nerve;—
Laden deep with coolest fragrance—
Calling forth the sweetest vagrants
To arouse the sleeping earth.

Then it is that brightest pleasures
Richly set with sweetest treasures
Wing my soul to other spheres;—
Deck it fair with gladest minions—
Send it far on lightest pinions
O'er the golden, sun-lit stairs;—

Up to bright and hopeful glories—
Up to realize the stories
Of the happy days ago.
Then it is that hope is lightest—
Then it is the world is brightest
In the fragrant, dew-kiss'd morn.

There is grandest inspiration
Fraught with noblest resignation
In the balmy airs of morning;—
Purest thoughts and best emotions—
Guiding few o'er life's sad oceans—
In the freshest dews of dawning.

Color and Odor in Flowers.

BY F. F. ROGERS, '83.

The whole history of man is marked by a superstitious feeling with which he has been wont to regard all natural phenomena. Whatever he has seen in nature that was new or startling he at first regarded as an evil or good omen, and then fearfully looked for something that would materially affect his race. So, when his range of observation reached the subject of natural history, all its peculiar forms were explained by ascribing whatever is pleasing to a direct gift of Providence for man's enjoyment, and whatever is ugly to the same source to punish fallen man.

In the whole range of science the beauty of nothing has been so much admired as that of flowers, and it is not strange that, with so little knowledge of their habits and ways of growth, people should begin to regard their beauty and fragrance as qualities intended only for man's gratification. This was an elevated feeling and has gradually become associated with purest thoughts and pleasantest remembrances. Much has been written to prove that flowers and all their attractive features were only to gratify man's æsthetic nature.

Poets have impressed the same feeling by their songs, and artists by their skill are continually reminding us that flowers were created only to add to our pleasure. All this, with personal associations, has given their colors and perfumes a place in human estimation so high that many shudder at any new suggestion as to the utility of these qualities.

Be this feeling ever so deeply rooted, men could not carefully study the minute structure of plants and watch the use to which color and odor are put, and their admirable adaptation to the purpose, without becoming convinced that these qualities are of vital importance to the plant itself. A careful study of the ways in which plants are fertilized, showing the aid given by insects to certain classes of plants, has already convinced most botanists that the presence or absence of color and odor is by no means accidental, and that, if present, they are for nothing less than the benefit of the plant itself. Where nature has provided a way of fertilization without the aid of insects, color, and often fragrance, is wholly wanting. In many cases the wind gives this aid. Grasses, willows, poplars and hazels are familiar examples of plants fertilized by the wind. In all of these color is absent, and in many perfume is also missing. Darwin says: "It is an invariable rule that when a flower is fertilized by the wind it never has a gaily colored corolla." On the other hand, where aid is needed for this work, nature has offered large inducements to insects, and as this need is greater the inducements are stronger. Lilies and irises, among which are some of our most gaudy flowers, are largely fertilized by insects. Here there is, not only adaptation for insect fertilization, but peculiar adaptations for certain classes of insects. Night-flowering plants are usually white, and so are easily seen by moths and other nocturnal insects, while flowers which are open during the day only are usually more gaily colored and marked with spots and veins to guide insects to desired parts. Kerner not only believes that color and odor are essential to the preservation of species, but "that position, direction and shape of leaf is of just as great significance." He says: "No hair is meaningless, whether found on the cotelydon, leaf, stem or blossom."

It is by close observation of similar facts that such men as Darwin, Lubbock, Gray and others have become fully convinced that color and odor are given to plants for their own preservation, and that the silent workings of these attractive features have had much to do with the present forms of plants and their geographical distribution.

As soon as the old idea that color and odor were for man's gratification was lost sight of, and plants were studied in the new light, the science of botany was placed on a new and firm foundation. Its students found everywhere a broad and fruitful field for observation. The new study has discovered many resemblances between plants and animals heretofore unknown. Plants had long been regarded as essential to animal life, but not till now did the startling fact become known that some plants, at least, are equally dependent upon animals. One botanist testifies to this resemblance when he

says: "Inter-marriage is as detrimental to plants as to animals, and nature has set all kinds of mechanical devices against it, and offered as many to induce the crossing." Gray says: "The animal and vegetable worlds diverge widely at the top, but are united by a loop at the bottom."

This new study places the two great worlds of organized life in a strange yet beautiful relation. If it is humiliating to man to learn that much which he had selfishly supposed was wholly for him serves another, a more important and a widely different purpose, it may tend to lessen his egotism. It does not draw man out of sympathy with nature, but merely places him where he can better study plants and animals in their own and mutual relations without the hindrance of the preconceived notion that all is for him. Such a view modern botany teaches, and if intelligently accepted it cannot fail to give man a grander conception of a far-sighted Creator.

Originality.

BY H. C. NIXON, '83.

If a man would make himself great, he must seize his thoughts as their light flashes across his mind, mould them in beautiful expressions, and cast them before the world in their brightest form.

He must not think that because the thought is his it is unworthy of notice. We are too apt to spurn our own thoughts as unfit for expression, simply because they are our own. The result is, we afterwards find the same thoughts expressed by another, and we are compelled to take our own treasures from the lips of another.

Emerson says: "Speak what you think now in hard words, and to-morrow what to-morrow thinks, in hard words again, though it contradict all you said to-day. Ah, so it shall be misunderstood! Is it then so hard to be misunderstood? To be great is to be misunderstood!"

Perhaps for the same reason that we cast away our own thoughts because they are our own, we prize the thoughts of others because they are another's. A man never appears half so great in his own works as in the works of another. Hence many great writers have sought to make their works more effective by ascribing many of their own thoughts to some one else.

Some may consider originality a very rare thing. It is, however, far more frequent than is commonly supposed; for we must not consider it as mere primacy of expression, as if a thought could be original but once. Indeed, it may be so many thousands of times; for the same person may originate the same thought as many times as it can spring from the same fountain of his mind which caused its first appearance. And so the same thought may re-originate in the minds of many persons.

Our trees and plants go on bearing leaves and fruit year after year; and yet can we say that the work they do is not original, simply because other trees have borne leaves and fruit before them? Shakespeare had his books of reference, yet it is said he was more original than his originals. Their thoughts were dead and heavy things, he lifted them up and put new life into them, and made them to stand forth in all their beauty and greatness.

So it is the very spirit of Shakespeare in man that enables him to appreciate those great works, and crown the author with his well earned praises. Every day we can, if we will, read our own rejected thoughts. And can it be said that they were either more or less original

when we thought and rejected them, than when some other person thought and wrote them down?

At times when our minds are very clear and strong, we read more in our books than the author really put there, and these are the most interesting and valuable ideas which we receive from our reading. It is because they are our own original thoughts. We notice this also in many of our conversations. The words often carry a far greater meaning to listener than was intended by the speaker. To whom can we give the honor of being the original thinker in this case? Surely it cannot be the speaker, for he merely uttered the words. It must then be the listener, for he conceived the thought. And yet the thought was suggested to him the same as if the speaker had conceived it before him.

Next to originality of thought comes quotation. How many persons there are who glance over great productions, without even the slightest thought that there are great and beautiful sentences there for their use if they will only use them. Let those sentences be once quoted, and soon they are on the lips of millions; then the whole world claims their use; but a person must catch the spirit of the writer, in quoting, if he would have others follow his example.

Such a person borrows nobly; others borrow simply because someone else has done so before them. We see great things in Milton, but many of us would have seen nothing had not greater minds led the way, and opened that grand sphere of thought to us which only Milton could open to them. We are always inspired with admiration on reading a passage that comes directly from the author, for the same light flashes across our mind while reading as flashed across his while writing; but if we attempt to make the thought our own by using an expression of our own, we lose the original thought in its clearness and beauty.

We should therefore speak our own convictions carefully and clearly, and when we wish to quote, do it, thinking that we are doing our readers or listeners a favor, by allowing them to listen to what we could not express half so clearly.

Sketch of the Life and Work of Asa Gray.

The science of botany in its modern growth has gradually grown away from the idea heretofore common with the majority of minds, so that its study is no longer associated with hard names arbitrarily applied to various plants; with this growth we inquire who are the master minds whose efforts have influenced the advancement of the interesting science. All agree in pronouncing Dr. Asa Gray, of Harvard University, the first and brightest light in America. A distinguished botanist, a ripe scholar, and ardently devoted to his favorite science, he presents to us a character for study, and a rare example for students to follow.

No person in America, nor perhaps in the world, has done more to bring about this common respect for botany than Dr. Gray. Indeed, he appears as one of the very first in any country to attempt a popular work upon this science. "When this work first appeared," says the *Popular Science Monthly*, "distinguished botanists abroad thought it either a waste of time or beneath their dignity to be engaged upon popular works; but of late years we find that the most eminent of them are putting out their 'Hand-Books' and 'Popular Floras.'" He has made the language so simple, and yet so expressive of the ideas to be conveyed, has described in such a popular and pleasing way even the most abstruse phenomena of vegetable structure and physiology, that those who have never received botan-

cal education and even children, may easily comprehend the subject. His "Lessons in Botany," probably his best work, is nothing less than a marvel of ingenuity. A reviewer says of it, "It is not only a superior work, but the best work upon elementary science of any kind that we are acquainted with. It is indeed a wonderful attempt at popularizing science. What are considered abstruse points in physiology are told with such a matter-of-fact simplicity, that the reader is charmed as with a tale, and, after reading it, is in possession of more of the philosophy of botany than he could obtain from a dozen more pretentious volumes."

Dr. Gray first came into notice in 1834, by presenting before the New York Lyceum of Natural History, a paper entitled "A notice of some new, rare, or otherwise interesting plants from the northern and western portions of the State of New York." This at once brought him to the notice of the botanists of the day. The fact that a young man only twenty-four years of age should discover and describe new species of plants, in the old and well-known state of New York, and should re-arrange those which had long been known from the confusion into which they had fallen under the disposal of the older botanists, was a matter of no little surprise to these older heads. About this same time he wrote a work in two volumes on "North American Gramineæ and Cyperaceæ," or the grasses and sedges of North America. As these two natural orders constitute by far the most difficult part of the study of flowering plants, we can appreciate to some extent the ability of this young scientist, the more so, too, as these volumes were much the best of any that had appeared previously. Indeed, a person at the present time who would write upon these subjects must refer to these works. Each of the volumes contained a hundred species, illustrated by dried specimens. Several new species were inserted, and the older ones largely re-classified and revised.

The next of his prominent works was begun in 1838, "The Flora of North America." This was written under the joint authorship of Dr. Gray and Dr. John Torrey, of New York. The subsequent joint work of these two botanists has been a fortunate circumstance for American science. Their ideas and motives being at all times in perfect harmony with each other, and their botanical accomplishments lying in somewhat different directions, they presented a symmetrical and elaborate work of the greatest scientific value. The Flora, however, was not completed. The geographical range it was intended to cover was an immense one. "Geographically it comprises the United States and all the North American continent and islands north, Greenland excluded." The western and south-western boundaries of the United States were at this time rapidly pushing toward the Pacific. New territory was constantly being acquired, nearly unknown in a botanical sense, causing the Flora to be continually growing more and more incomplete. Hence when two volumes were completed, extending the work through the great order Compositæ, the project was abandoned. Quite recently, however, Dr. Gray has again taken up this work, and four years since issued a volume comprising the plants from Compositæ through the gamopetalous exogens. It is proposed to entirely revise the first two volumes.

A series of valuable botanical memoirs by Drs. Gray and Torrey, succeeded the interruption of the Flora. Herbariums collected by a number of scientific expeditions sent out by the government, were sent to Dr. Gray for classification. The details of such labors are given in numerous department reports and scientific proceedings.

In 1848 our author began an elaborate work on the "Genera of the Plants of the United States." "The

design of this work," says the preface, "is to illustrate the botany of the United States, by figures with full analyses of one or more species of each genus, accompanied by descriptive generic characters and critical observations." The drawings were made by Mr. Isaac Sprague, and were marvels of beauty and accuracy, such as have never been excelled in any other country. Two volumes of this work were issued, each containing one hundred plates, when the work was discontinued for the same reason that the publication of the Flora was suspended, and because the artist could not be induced to continue, as he thought his drawings were not appreciated.

Other important works are "Elements of Botany," 1836; "How Plants Grow," "How Plants Behave," "Manual of Botany," "Field, Forest and Garden Botany," "Structural Botany," and "Darwiniana," a review of the theories and experiments of Chas. Darwin.

Aside from his many elaborate works, Dr. Gray has won a national reputation through his very extensive communications to various scientific periodicals. For twenty-six years he has been associate editor of the "American Journal of Science and Arts," nearly every issue containing some valuable article from his busy pen. One of his ablest articles points out the relations of the Flora of Japan to that of eastern North America. Besides this he is a contributor to the North American Review, Atlantic Monthly, Transactions of the American Pomological Society, and numerous journals of agriculture and horticulture. His writings, however, are not confined to botanical subjects. Many anonymous contributions to the American Review are excellent additions to our literature. Besides this he has made a critical review of almost every work on botany that has appeared during the last twenty-five years, either in our own country or abroad.

Asa Gray was born in Paris, Oneida county, N. Y., Nov. 18, 1810. He graduated in a medical course at Fairfield College, Herkimer county, N. Y., in 1831. He relinquished the study of medicine, however, to pursue his favorite science. His love for the science is seen in his devotion to it. He sees in every flower a constant beauty; he admires their forms and their relations to surrounding objects. It is said to be nearly impossible for a person to study under his direction without catching something of his inspiration. He delights in the vegetable world, and his students unconsciously follow his emotions. There is hardly a professor of botany in the United States but has been at some time his student.

In 1834 he was appointed by the government as botanist to the United States Exploring Expedition, but the expedition being tardy in sailing, he resigned his position. His name is the first among the first list of professors elected to the University of Michigan; he never filled the position, however, but accepted the professorship at Harvard, in 1842, where he served until 1873—31 years—when he retired from active service, to remodel at leisure the extensive herbarium of the University, the foundation of which he materially aided in his younger days. The botanic gardens, greenhouses, etc., of Cambridge are living monuments to his labor.

In 1861 Hamilton College conferred upon Dr. Gray the degree of LL. D. He is a corresponding member of all the leading scientific organizations of Europe, and active member of all in this country. For ten years he has been president of that distinguished body of naturalists, the American Academy of Arts and Sciences, and in 1872 was president of the American Association for the Advancement of Science. He is also one of the regents of the Smithsonian Institution.

His great forte is systematic botany. In this he has won a world-wide reputation. No living botanist excels

him. America's first botanical scientist stands second to none. He came upon the scene of action when scientific botany needed a strong and skilled hand to disengage it from the entangled remains of the old artificial systems. His work he has done well. A world of scientists honor his name.

He is now nearly seventy-two years old, but still full of vigor and energy. His long life has been one of excessive toil. His habits are regular, food simple. He seldom studies after ten o'clock at night, generally retiring at that hour, or half an hour later. When he works he works hard, and his regular time for relaxation which follows, he enjoys with all his ability. A person says, "One of our pleasantest recollections of him is seeing him, after a hard day's work, engaged in a rough-and-tumble frolic with an enormous Newfoundlander." His life has been one of uninterrupted good health, preserved by good and regular habits. One says, in speaking of his old age, "We have not tried a walk with him for several years, but we venture to say that few young men of twenty could take an afternoon's tramp with him, and not feel a sense of relief when the excursion was ended."

Scientific.

The Natural History Society

Met on April 14th for the first time in the spring term, after a long winter vacation of three months and a half. One hundred and three persons were present, President L. H. Bailey, Jr., in the chair.

Dr. Beal read a paper on "A comparison of the epidermis on both sides of leaves." We present an abstract: As a rule when young, plants and animals are much less complicated than when older. They take on the details and peculiarities of structure as they arrive at maturity. Twenty-five or more kinds of plants had been compared. Both sides of cotyledons were compared as they were nearly full grown.

The higher plants growing with the tops in air are usually covered when young with one or more layers of transparent cells, called an epidermis. The hardest, firmest, thickest leaves usually contain an epidermis of thick-walled cells. On the lower side of a leaf or cotyledon, we generally find that one layer of cells constitutes the epidermis. On the upper side of leaves we may find one layer in some plants, and two or three or more on leaves of other plants. A firm epidermis enables a plant to endure very dry weather. Now and then, among other cells of the epidermis, may usually be seen small openings, each surrounded by two or more cells containing chlorophyll. These openings and the cells about them constitute the stomata.

These stomata open in wet weather, and close in a time of drought. To some extent, they help control the evaporation of moisture from the surface.

The plants studied were quite variable in appearance, herbs, shrubs and trees. The idea brought out is shown by the illustration of the epidermis of *Impatiens fulva*, wild balsam. The lower side and the upper side of young cotyledons look much alike. There is not much difference in the size or shape of the cells. The cell walls are straight, or nearly so, not much wavy. The number of stomata is about the same on both sides. In an old cotyledon, the lower cells are much more wavy or diversified in outline than those on the upper side. They are about equal in size. The number of stomata is about the same on both sides. In the case of the mature leaf, the cells of the lower side are larger, more wavy and have much the greater number of stomata. In the young cotyledons, in size of cells, shape of cells

and number of stomata, the two surfaces are about alike, while in the mature leaf, they differ considerably in all three of these particulars.

Dr. Kedzie spoke of "The line of fracture in glass as a means of determining the direction in which the fracturing force was applied."

One distinctive characteristic of glass is that it does not tend to fracture in plain surfaces; but its fracture is conchoidal, an uneven or shell-shaped surface instead of a flat plain, such as is seen in the cleavage of many crystalline substances. The direction of the curvature of such conchoidal fracture gives us one means of determining the direction of the fracturing force.

The simplest illustration, and one about which there can be no dispute regarding the direction in which the force was applied, is seen where a bullet has been fired through a pane of glass. Fire a bullet through a window glass, and you observe that the glass presents a sharp cutting edge on one side, while the other side presents a series of shell-shaped surfaces where the bullet carried the glass before it as it passed through the window pane. No one looking at such a bullet hole would be at a loss to know which way the ball went, for the even surface and sharp edge on one side of the glass, and the ragged surface and shelly fracture on the other side, would satisfy any intelligent observer. Another example is afforded by taking a narrow strip of glass, placing this upon a table with a sharp edge, pressing one part of the glass firmly upon the table with one hand and bending the other end of the glass down over the table-edge with the other hand till it breaks. If the glass breaks with a single fracture, it will be found that the sharp cutting edge of the glass that remains upon the table and resists motion will be uniformly upon the upper side, and the rounded or conchoidal surface will be upon the under side. By examining the piece which remained upon the supporting table and resisted motion, it is easy to determine which was the upper surface and the direction the force was applied. Sometimes the glass breaks in many pieces, and the indications are not then so clear.

Let us apply the same investigation to lamps and see whether we can determine whether a lamp has been broken by a force externally applied, or a force acting from within, as in the case of an explosion. In such an investigation, we must not direct our attention to all the broken pieces indiscriminately. In breaking a strip of glass over a table edge, the piece of glass which yields to motion and that which resists motion will present surfaces and edges the exact reverse, one from the other. In such investigations, we fix our eyes upon the parts which do not yield to the moving force, *e. g.*: the base or standard of the lamp which remains, as distinguished from the fragments scattered by the fracturing force. Here are lamps which have been exploded, the force acting from within outward; and you observe that the cutting or sharp edge is on the inside, and from this edge the fractured shells are outward. Here are other lamps broken by an external blow, and you see the cutting edges of the parts which remain attached to the standard are upon the outside, and the conchoidal surface is on the inside. The blow acts externally for the most part only upon the side to which it is applied, and, secondarily, may act as a force from within the lamp upon the opposite side; and upon that side you will sometimes find the cutting edge upon the inside. But when you find the sharp edge upon all sides of the portion of the lamp remaining attached to the standard or base of the lamp, and the fracture rounding outward from this internal edge, you may safely conclude that the lamp was broken by some internal force and not by external violence. In this way the question whether a

given lamp was exploded or broken by an external blow, may often be settled in a most conclusive way by examination of the portion which remains.

Dr. Kedzie also called attention to the guard posts on the walks near the chemical laboratory, which have been painted with Balmain's luminous paint. This paint is a specially prepared sulphide of calcium, which will absorb light by day and emit light by night. The posts shine with a purplish phosphorescent light, which is more visible the darker the night. This paint is used to illuminate clock faces, to paint buoys in harbors, etc. It would be applied in many ways to store up daylight for use in the night if the price of the paint was more reasonable. Perhaps by the use of this or some better phosphorescent substance, we may yet yoke day and night together, in a way we little imagine at present.

W. C. Latta gave the results of an incomplete series of experiments in milk setting. Glass tubes of uniform size were used, so that the depth of cream could be accurately measured.

Deep or shallow setting had no effect on the per cent. of cream rising. Milk from the Ayrshire and Shorthorn breeds was repeatedly set at depths ranging from one and a half to nearly eight inches, but the results were about the same in every case.

Effect of Temperature.—Three lots of milk were taken, each lot containing samples from the Ayrshire, Shorthorn and Holstein breeds. Lot 1 was set at 75° Fahrenheit; lot 2, at 80°; and lot 3, at 90°. In twelve hours the temperature of the first and second lots was 54°, and the third lot, 56°. The lots had cooled 21°, 26° and 34° degrees respectively. The first lot had the highest per cent. of cream, and the third lot the lowest. During the next six hours, the temperature of lots 1 and 3 rose, and at the end of this time was 66° and 60° respectively. During this time the temperature of lot 2 was kept falling till it reached 43°. The cream was then again examined, showing no perceptible increase in lot 1, a marked gain in lot 2 and only a slight gain in lot 3. During the next three hours there was no gain in the per cent. of cream, and in almost every case a shrinkage. Lot 2, which had been cooled 37° in fifteen hours, gave very much the best results. This experiment appears to confirm Prof. L. B. Arnold's view, that cream will rise best in a continuously falling temperature. It would be unsafe, however, to make deductions from a single experiment.

Effect of Breed.—Milk from the three breeds before mentioned was set at different times, under identical conditions, and allowed to stand twenty-four hours. The Shorthorn milk gave the highest per cent. of cream, and the Ayrshire the lowest. The Holstein milk was from a single cow, there being but one here. The others were mixed, and therefore average samples.

Professor Cook has lately observed a very striking illustration of Darwinism in the development of two silk moths. The *Platysamia cecropia* is a large and beautiful moth working upon the apple tree. It is well marked and easily distinguished from other moths. The *Platysamia colombia* works upon the larch, and is quite distinct from the cecropia moth. These two moths—the cecropia and colombia—have always been regarded as entirely distinct species. Professor Cook, however, has lately reared specimens of each of these moths from cocoons from the apple and larch respectively, and and strange enough the moths are so nearly alike as to destroy all specific characters. There are strong appearances of a regular gradation between these two species of insects, showing how by peculiar surroundings one has gradually given rise to the other.

It is interesting to study the peculiar ideas of men who were considered good scientists a hundred and fifty or more years ago. The following quaint "theory of soyles" is from a work on "Ten Practical Discourses concerning the Influence of Earth and Air, Fire and Water, as They Relate to the Growth of Plants," written by R. Bradley, Professor of Botany in the University of Cambridge, England, in 1727,—just a hundred years before aluminum, the metallic base of clay, was discovered:

"We may also take Notice, that Sand is of various Colours, as grey, yellow, orange or red, blue, and black, and if any of these Sands, Supposing them to consist of round Parts, happen to be mix'd with a due Proportion of the Parts of Vegetables and Animals, they produce a fertile Soyl, Which is more or less pinquid as the viscous or the oily Matter abounds in them, thus have We Earths of all these Colours, and of various Degrees of Fertility, Strength, and Stiffness; those which have their Parts most closely united by this means we call clay, and those Earth which are less binding, and are in the Middle Degree between Sand and Clay, we call Loam; and from these we may reason upon all the rest.

"As a Demonstration of what I lay down, if we take Clay of Different Kinds, and lay every Sort in so many different Pans of water, till they dissolve, either of themselves or by Force, we shall find, either a viscous or oily Matter swimming upon the Surface of the Water; and upon examining the Earthy Parts, we shall find its Principle Sand connex'd with such dusty Parts as I have mention'd, as will appear by the Microscope; which will plainly discover them to be broken Parts, either of Vegetables or such things as have had their proper Vessels for their juices to move in, such as cannot be found in Sand or any kind of Stone."

The valleys of the lower Wabash and other streams of Southern Indiana are remarkable for the great trees which they produce. Case's *Botanical Index* mentions a chestnut in Jackson county that measures 22 feet in circumference two feet above the ground, and a sycamore on the White river that is 48 feet in circumference and solid. Dr. J. Schneck, in "Flora of the Lower Wabash," gives the following measurements, the first figures in each case being the circumference three feet above the ground, the second figures the height to the first limb, and the third the total height: Pecan, 16 feet, 90 feet and 175 feet; black oak, 20, 75 and 160 feet; burr oak, 22, 72 and 165 feet; white oak, 18, 60 and 150 feet; persimmon, 5½, 80 and 115 feet; black walnut, 22, 74 and 155 feet; catalpa, 6, 48 and 101 feet; scarlet oak, 20¼, 94 and 181 feet; bass-wood, 17½, 50 and 109 feet; sycamore, 33¾, 68 and 176 feet; white ash, 17½, 90 and 144 feet; cotton wood, 22, 75 and 170 feet; tulip tree (white wood), 25, 91 and 190 feet.

As buds give rise by growth to fresh buds, and these, if vigorous, branch out and overtop on all sides many a feebler branch, so by generation I believe it has been with the great Tree of Life which fills with its dead and broken branches the crust of the earth, and covers the surface with its ever-branching and beautiful ramifications. — Darwin.

Ohio has passed a bill establishing an experimental station, to be controlled by a board of five, to be as follows: Governor of State, one from the State Board of Agriculture, one from the State Horticultural Society, one from the State Grange, and one a professor at the Ohio State University. Prof. Lazenby represents the University on the Board. The results will be published in the annual report of the State Board of Agriculture. New York, Maine and many other states have similar stations; and is it not time that Michigan moved in the same direction?

The College Speculum.

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BY THE STUDENTS

—OF—
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LANSING, MICH., JUNE 1, 1882.

THIS issue closes volume one of THE SPECULUM. With its close the present board of editors resigns its duties, and it may be well to give some idea of the condition of the work they are leaving. THE SPECULUM was organized as a students' paper, to be maintained by them and to afford a medium to express their thoughts and desires. It was, consequently, agreed and expected that it should not only receive their pecuniary aid, but also a free and generous contribution to its contents. We are happy to say that the former of these requirements has been thoroughly met by essential aid in subscriptions, but the contributions have been received only through a continual solicitation, if at all. Indeed, so irksome has become the work to the editors that they feel a great relief in the completion of their duties. During even the short existence of the paper, students have come to look upon it as the work and property of the editors alone, and they seem to feel no responsibility for its contents. If THE SPECULUM should ever prove a failure, it will probably be from this general neglect. The editors may regard their task as an arduous and thankless one.

In a pecuniary way the success of THE SPECULUM has been most gratifying. Notwithstanding the low price of the paper and the many expenses attendant upon the starting of a new enterprise, it has paid all expenses for the year and has a considerable fund on hand for the improvement of volume two. The first issue was one thousand copies, a large portion of which were taken on regular subscriptions. Every alumnus and undergraduate, as far as their addresses could be obtained, have been urged to subscribe, and the readiness with which they have responded speaks well for their interest in alma mater. The editors have had constantly in mind the wants of the alumni, and they are thankful for the appreciation rendered.

It remains for us to say a word in regard to the competent board of editors elect. Mr. O. C. Howe, '83, of the Union Literary Society, who has so satisfactorily edited our personal department for the last year, has

been elected editor-in-chief. The Natural History Society elected Dr. R. C. Kedzie; the Delta Tau Delta, Mr. H. W. Collingwood, '83, our former business manager and author of commendable articles in volume one; the Phi Delta Theta, Mr. C. E. Smith, '84; the Eclectics, Mr. A. C. Bird, '83. Mr. D. C. Holliday, Jr., '83, was chosen business manager, and Professor Johnson was re-elected treasurer. We gladly greet the new incumbents; may their vigilance never sleep, nor their pens ever grow weary!

WE wish to urge all alumni to be present at the triennial re-union next August. It is expected that the meeting will be the most interesting of any ever held. Very many of the members have already written their intention to be present, and, as far as we can learn, all are anticipating an enjoyable and profitable visit. The orator, poet and historian have expressed their acceptance of their offices, and are preparing themselves for the occasion.

Those who have not visited the College in the last few years will hardly recognize the old, familiar landmarks. Their alma mater has grown beyond the anticipations of the earlier students. It has come to be a resort alike for those acquiring a scientific education and for those who wish to spend an occasional day in recreation. New buildings have been erected, the lawns have been extended and more students are in attendance, until one almost thinks himself in a neat, quiet, intellectual village. But much more needs to be done. The College needs the aid of its sons in disseminating its merits among the people of the state. Already the people are looking to the College as a leader in agricultural and scientific matters. The alumni should be the first to catch up this strain of praise and inquiry and to send it forcibly home to every intelligent community. They should keep themselves in sympathy with the advancement and needs of the institution. Do not think yourselves unimportant factors. The College relies upon you, for you are the fruits of its labors. Make your alma mater a visit. Meet your old classmates and friends, and revive once more the pleasant memories of your college life.

But it is not to the alumni alone that we wish to address this invitation. Those who have ever been students at the College and friends of the institution are not forgotten, and their presence will be heartily welcomed.

Come!

EVERY friend of the College will feel a keen interest in the efforts being made to secure a mechanical department. The Congressional land grant and the state law require that the Agricultural College shall teach the mechanic arts. This requirement has never been met, and much censure has been heaped upon us in consequence of the deficiency. We have probably been losing ground, in an educational point of view, for the last few years. While it is true that no other institution in the United States, having but a single course of four

years instruction, has as great an attendance as we, it is nevertheless apparent that we have developed to about the extent of our possibilities in this direction. It now devolves upon us to broaden our curriculum, or to remain forever in a narrow and stationary condition. The efforts which are now being made to secure these additional advantages are already dilatory. The State University has organized a small mechanical department, and it will undoubtedly claim of the legislature the right for appropriations to rapidly increase it. Mechanical instruction, supported by the state, belongs, however, to the Agricultural College, and we should make an effort to secure it. Our proposed mechanical department will be copied largely after the excellent system of the Illinois Industrial University at Champaign. Professor Carpenter and Hon. H. G. Reynolds, members of the committee for visiting other institutions for the purpose of obtaining information concerning the matter, visited the Ohio University and the Purdue University a few days since. They prefer the Illinois method to that adopted by the Iowa Agricultural College, as it not only affords students the same advantages of instruction as the making of models exclusively, but also brings a considerable income from the sale of actual machinery. Both wood and iron work will be included. All students in the regular course will probably be required to take a certain amount of shop practice, while for those who take the four years' mechanical course, a thorough course of lectures, and shop practice in detail will be given.

Alumni and friends of the College should lose no opportunity to press the need of a mechanical department. An appropriation will be asked of the next legislature, and all should use their influence to see that it is obtained. There can be no doubt in any mind that such a department is the greatest need of the institution, a need which must certainly be met if we keep abreast the expanding education of the times.

It may be presumptuous for THE SPECULUM to advise concerning the appointments for members of the State Board of Agriculture, but we believe that the needs of the institution would be more satisfactorily met if alumni of the College were to compose a majority, or even a large minority, of that body. Not until three years ago was an alumnus ever placed upon the State Board, and from this limited experience we unhesitatingly wish to see the practice continued. There are many whom we would be proud to mention as highly worthy and capable of seats on the State Board of Agriculture, who are acquainted with the needs and the merits of the institution and who are fully in sympathy with industrial education. Who knows better than they what are the advantages and disadvantages of the Agricultural College? Who could better remedy its disadvantages, who better shield and strengthen its merits? These memberships are not ones for the Governor to fill from political favorites or from personal friends, but from men who are most in sympathy and are best acquainted with the College.

WE are pleased to learn that the members of the State Board of Agriculture and of the Faculty are beginning to talk about introducing military tactics into our course. The committee which was appointed to visit other institutions for the purpose of enquiring into their mechanical departments, was requested to enquire into their military systems also. Better late than never. Of the industrial institutions of the United States at least twenty-three have chairs including military tactics. Is Michigan abreast the times?

AGRICULTURAL Colleges are founded for the purpose of imparting a knowledge of those sciences which pertain especially to agriculture and the industrial arts related to it. The extent to which this purpose is carried out determines the value of these schools as educators of the farmer and gardener. One of the best means of judging of the merits of a college and its work is by noting the extent and efficiency with which the graduates practice the principles that have been taught them. Let us, then, examine the list of the alumni of this College and see how well it has filled its mission. The vocations are numerous in which our graduates are engaged, yet sixty-two per cent. of them are pursuing those professions which are subjects of special study in this College. Of the graduates, forty per cent. are farmers, who are doing much to elevate their class of work by making it more remunerative—in a financial way, by practising the most improved methods of farming; in an intellectual way, by making further experiments in their work. No other school of its kind can show so favorable a result. Of those who have completed the course at the Illinois Industrial University, which is the largest school of its kind in the West, only thirteen per cent. are farmers; at the Massachusetts Agricultural College, twenty-three per cent.; and at the Agricultural College in Maine, twelve per cent. Nine of our graduates are fruit culturists, thus showing that nearly one-half are strictly engaged in agriculture. Eleven graduates are full professors in different colleges, and five are instructors, who, at no distant day, will become professors. Two professors and one instructor have died. In all, eight per cent. of the graduates are teachers of a high order. Nine machinists and five engineers have been graduated, yet, with a mechanical department, a much better result could have been obtained. With no instruction, except that given in the class, students as well as graduates have been able to do reliable work in land and railroad surveys. Among those who are not strictly employed in work pertaining to agriculture there are twenty-five merchants, twenty-four lawyers and seventeen physicians, and most of them entered college with the intention of following one of these professions. While their work is somewhat different from that for which the present work prepares one to follow, yet the College may well be proud of their occupation and the degree of success they are attaining. Many others are doing valuable work as teachers, editors and clergymen. Four are authors of books which have been very favorably

received by the public. Two are members of the legislature in this state, and two others members of the U. S. Signal Service. Fourteen have died, reducing the number of living graduates to two hundred and thirty. It is a fact worthy of notice that many more will be farmers, but who chose for the present other professions because of their inability to secure a satisfactory start at farming. Thus we find the College doing good work in educating farmers' sons, and, at the same time, combating those arguments that are brought to bear against it.

WHILE the different departments are obtaining means for buildings and improvements, it should not be forgotten that the dormitories are in great need of repairs. Wells' Hall was never decently completed; the plaster was frozen in most of the building, and it was poorly put on at that; many of the rooms are entirely unfit for occupants until papered or kalsomined by the student. A slight jar will often provoke a most ungenial shower of sand and mortar. Many of the upper rooms leak also. The greatest need of the building, however, is a water supply. We would call attention to the fact that there is absolutely no means of protection against fire. Each confined department of the building has but a single stairway, and that is narrow and crooked. There are one hundred students in the building, all using lamps and matches. Still, there is not a drop of water furnished the building, and no means of getting any if an emergency should occur. Williams' Hall is supplied with water and hose; the same should be provided Wells' Hall. Again, as a matter of accommodation to students, this water supply should be provided. They occasionally wish to have water moderately accessible, and several have been known to desire soft water for toilet purposes. Williams' Hall needs a new roof—one that slopes toward the sides, not towards the middle. We have often heard it affirmed that the \$2.25 a term for "incidentals" goes to repair the buildings. We have always promptly denied it—for obvious reasons.

NOTWITHSTANDING one of the objects of manual labor at this College is the preservation of health, our students, like other people, are occasionally ill. Unseasonable and irregular hours for study, green apples, swimming in the river after meals, cold rooms, unsuitable clothing, the mumps, the measles, an unlucky move on the ball ground, are some of the agents which occasionally disable our young men. When a student is too ill to report for study, he needs quiet, cheerful surroundings, and the help and advice of a good nurse. At present we have no resort except our own rooms, which are often poorly furnished. Students' halls are not always quiet; to return home is expensive, takes time, and is generally unnecessary. It is indeed gratifying to the numerous friends of the institution to notice the great number of improvements which are continually being made. Our wants are not all supplied, and in a progressive age it is not likely that they ever will be.

We need a hospital—a pleasant room or two, neatly fitted up in a cottage, or on some portion of the grounds, away from the main buildings. The rooms should be near the ground, and presided over by some good, skillful, motherly woman. In making up a list of the needful things, may the "authorities" not forget a hospital. It would make student life at the College more pleasant, and would often be the means of retaining those who might otherwise return home dissatisfied, or go to some other institution. To become attached to a college, a student wants to feel well while he is there. The comforts of the body should be carefully maintained.

LAST vacation when we were called out by a false alarm of fire in Wells' Hall, we were led to very grave consideration of how we would extinguish a fire, should one break out in any of the buildings, and especially Wells' Hall.

The only protection that this Hall has is a well from which water could be carried in pails, etc. Williams' Hall is a little better supplied, having places for the attachment of small hose, but the hose is in some place where, we will venture to say, not ten students in College know where it is. Then, again, the present hose is too small to throw a stream large enough to make any impression on a well-started fire. College Hall has the protection of a small cistern with a broken pump. The Botanical Laboratory has little or no protection. The Chemical Laboratory has not a sufficient water supply, and a fire might occur when the tank there was entirely empty. The eight farm buildings have only three wells and cisterns.

From these statements one can see how necessary it is that something should be done before we suffer some severe loss from a lack of sufficient protection. It would cost only a fraction of the loss that must be incurred by a fire, to add much to the comfort and security of our buildings. We have an excellent pump in the boiler-house, but our present tank is not large enough to supply water until steam could be generated sufficient to run the pump. The first requisite is a larger tank so situated that it could supply all the buildings with water. It is proposed to put a tank in the tower of Williams' Hall, which will hold 200 bbls., providing the tower is strong enough to hold it. This should be connected with all the buildings by larger pipes than are now used.

The following is a rough estimate of the cost of such a system:

3000 feet of 3 and 3½ inch pipe laid at 50c.	\$1,500 00
Valves	150 00
25 hydrants, at \$20.	500 00
200 feet 2 inch hose, at 75c.	150 00
Hose cart.	100 00
Tank, 200 bbls.	500 00
	<hr/>
	\$2,900 00

If Williams' Hall tower is not strong enough, there will be in addition to this the cost of a tower. The mere statement of the facts shows clearly that we need something of this kind, but whether this is the best plan is a question. This proposed plan would only supply

adjacent buildings and would not be sufficient for the Botanical Laboratory and Faculty Row. It would not be high enough to throw a stream to the top of Wells' Hall, Library and Museum building, College Hall and some of the barns, but water could be carried to their tops in pipes. Would it not be better to have a tank large and high enough to supply the whole College grounds with a good head of water? With such, mains could be laid as rapidly as practicable to all parts of the grounds. The gardens could receive their much needed irrigation. The wind-mills and tanks at the green-house and farm could be discarded, thus saving much expense each year in repairs. It would save the expense and trouble of having tanks in Professor's houses. It would give a means for sprinkling our lawns. It would furnish water for some fountains that might be placed on the grounds with no loss of beauty thereto. We could present other advantages, but enough have been given to show that a great improvement to our College is still to come, and to come soon, we hope.

In this connection we may speak of a bath-house, which is generally considered a good thing to have. A second story could be built to the proposed boiler-house, where hot water could be had at all times by a moderate expenditure of fuel. Here eight or ten bath-rooms could be placed, at a cost of \$250 to \$350, which would add greatly to the comfort and health of the students. Let this matter be considered before the estimates are made for the boiler-house. It would be difficult to get a supply of hot water elsewhere on the College grounds, and as we certainly need some bathing arrangements, let this item be considered when planning a boiler-house.

If ladies are ever to be admitted to the College, now is the time to make the effort. Like the proposed military system, the erection of a ladies' hall has long been discussed; appropriations for the purpose have been asked of the legislature. However, there has been no combined and persistent effort made. If the determination were made to win, and this determination persistently pressed, we doubt not that success would soon be the result.

WE now have the library moved into the new building, and new books are being added rapidly. This is gratifying. The students should get the greatest good from the library that is possible. To do this, they must have a library catalogue, and have the library open all day. A librarian could be engaged at a moderate salary; the library could be catalogued for about \$250. Should this not be done?

We give our readers a cut of the new library and museum building as seen from the north entrance to Williams' Hall. The older alumni can locate the building by knowing that it stands a few rods directly north of the old dormitory—"saint's rest." It is just at the eastern edge of the old football grounds, the trees that once constituted the "line" being directly in front of the building. Improvements are slowly encroaching upon the student's favorite hunting-grounds, and are driving him farther from the battle-fields of his fathers.

Correspondence.

WE should be pleased to receive communications on various topics for this department, from time to time.

Anonymous articles will not be noticed by the editors.

All correspondence should be addressed to C. E. SMITH.

We print the following from a private letter from Mr. N. P. Graham, class of '79, who was obliged to leave College three years ago on account of ill health. Since that time many sad reports have been received as to the condition of his health, but the following brings good news to us all:

SAULT STE MARIE, Mich., April 30, 1882.

* * * It lacks but a few days of three years since I was taken home from Lansing with brain fever, complicated by cerebro-spinal difficulty. From that time till the late autumn it was an open question each week whether I should live to see another one. The winter saw my health somewhat improved, but with the return of warm weather I again started on a downward course. During that whole year my head had been in an alarming condition. I could not read half an hour at a time; could not study at all; could not stand excited or prolonged conversation, and had an almost constant feeling of oppression, of dizziness and of blackness. I could not walk half a mile, and part of the time had not strength enough to drive my own horse. I had taken medicine enough to have started a drug store. I could neither eat nor sleep; and it seemed a great many times as if the only favor life had yet to give was—death.

My doctor told me that he knew of nothing more except a change of climate, with the thought to be inferred that his faith in that was not of the kind that moves mountains. But, acting upon his advice, I came, with a friend who staid with me a few weeks, to Northern Michigan. I first came to the Grand Traverse region. Then, away books and even newspapers; went fishing for speckled trout in the nearest brook; sailed out with the fishermen to take up their nets full of whitefish and Mackinaw trout; hunted wild pigeons and ducks; rode with the farmers out of town, trusting to luck to get back; gathered "specimens," and, in lack of anything else, have lain for hours on the bright side of a sand bank sunning myself like a woodchuck.

Now for the result. In three weeks I was eating "like a dog." When the smiling waiter girl would propound the usual question of a morning, "beefsteak or fish?" I would feel constrained to answer, in as even a tone as I could, but firmly, "beefsteak and fish."

There is something in the odor of pine and spruce and in the lake air which makes every one hungry. I remained in this northern country till autumn, doing nothing that was work. I wrote some poor poetry, with which I bored the country editors, and which they, with a wisdom far beyond what one would be led to suspect by seeing them, invariably refused to publish. I went home in October and went to teaching school, walking a mile and three-quarters twice a day! I have been troubled some since, and this spring I came to the Upper Peninsula, as I now think, to stay. I have been here but a few weeks, but I already feel better. I tramped twenty-six miles a day for four days in succession through the woods, so, you see, I am not very "weakly."

Mr. Graham's permanent address is Marengo, Mich.

Mr. G. E. Kedzie, '73, a nephew of Dr. Kedzie, is a United States mineral surveyor in Colorado. We extract the following from a letter written from Chihuahua, May 15:

"Last summer Mrs. Kedzie and I made the ascent of Gray's Peak, which has an altitude of 14,341 feet, and is about three miles distant from here. While upon the summit we had quite a remarkable experience with an electric storm. We were standing upon the top of a low stone building viewing the scenery, which is grand beyond description, and watching a small storm cloud coming toward us and up one of the valleys. The solitude is almost painful at this altitude, and we were very much startled at hearing a report very much like a fire-cracker, which was repeated several times before it dawned upon me what the cause could be. As little pellets of snow were beginning to fall, I suggested that we go below under the roof, and as I partially descended to assist Mrs. K. down, leaving her higher than I, she began to prance around as a surprised woman only can and exclaimed that her hat was full of crickets, and pulling out her hat pin to remove her hat, found that the crickets were upon the point of the pin. Reaching the ground below the summit of the building, the four corners of the building commenced to hiss like a very powerful electric machine, and continued to do so until the storm was nearly over. Going to where the horses were hitched to a stone, I found them equally surprised, for whenever they raised their heads above their backs the bridle irons would commence to snap and hiss, when the horses would shake their heads and lower them

to their knees. Several surveyors have recently informed me that they have been caught in these storms at high altitudes and compelled to leave their instruments and chain until the storm was over on account of the escaping sparks and shocks."

Having generally received praise for THE SPECULUM, we take pleasure in printing the sequel to the only criticism ever received, which was printed in our last:

OBERLIN, O., May 1, 1882.

EDITOR OF THE SPECULUM:

DEAR SIR—The third number of THE SPECULUM came to hand a few days ago. I was quite surprised to find my letter among others in your correspondence column. I think, however, you have done very well in complying with the request contained in it. Each succeeding number has been better than the last, and I think the 50 cents well invested that paid for the year's subscription. * * * *

H. V. CLARK, '78.

Colleges.

Columbia is to have a new library building, costing \$250,000.

Fraternity badges in Germany consist of narrow ribbons, worn across the breast or cap.

Harvard has, we understand, a Total Abstinence Society of over four hundred members.

Last year Wisconsin expended \$2,670,748.54 in public education, an average of \$7.67 per pupil.

Gen. J. W. Keiffer, Speaker of the U. S. House of Representatives, is an alumnus of Antioch College.

The Alpha Tau Omega fraternity is rapidly adding new chapters. It has lately entered Adrian College with a good membership.

Mr. Orville Brewer, a graduate of Beloit College, Beloit, Wis., has got up a new college song book. His address is 441 Washington street, Chicago, Ill. Price, \$1.30

Mr. John S. Slater, of Norwich, Conn., has given \$1,000,000 for the education of colored people in the south. R. B. Hayes is chairman of the Board of Trustees. Let others follow this noble example.

Ohio has provided for the establishment of a State Meteorological Bureau, with Prof. Mendenhall, professor of physics at the Ohio State University, as a member and probable head of the Board of Trustees.

The *Golden Key* is a new fraternity paper representing the Kappa Kappa Gamma, a ladies' fraternity. It is published at Indianapolis, Ind., with Miss Minnetta Taylor, of Greencastle, Ind., as editor-in-chief.

Trinity College, Hartford, Conn., holds annual examinations in Chicago and other western cities to save candidates the expense of so long a journey. The idea is an excellent one, and gives Trinity many students she would not otherwise have.

The circulation of some college papers are as follows: The Dartmouth, 1,050; The Chronicle, 1,000; Princetonian, 1,000; Yale Courant, 800; Yale Record, 600; College Speculum, 600; Yale Literary, 550; Harvard Crimson, 500; Oberlin Review, 509, Argus, 500.

A college press association was organized May 3, at Indianapolis, Ind., the officers being the editor-in-chiefs of the following papers: President, *Knox Student*, Galesburg, Ill.; Vice-President, *Franklin Collegiate*, Franklin, Ind.; Secretary and Treasurer, *Vidette Reporter*, Iowa City. Two prizes, of fifty and twenty five dollars, are to be awarded by the association for the two best articles appearing in college papers.

The Inter-State Oratorical Convention held its eighth annual meeting at Indianapolis, May 3, 1882. Ohio, Iowa, Illinois, Wisconsin, Minnesota and Indiana were the states represented at the convention. In the state contests, the following gentlemen won the first place, and consequently were sent to Indianapolis: C. E. Jefferson, from Ohio; W. W. Clark, from Minnesota; A. J. Craven, from Iowa; T. G. Hanchett, from Illinois; H. S. Fiske, from Wisconsin; C. L. Goodwin, from Indiana. The contest occurred in the evening before a large audience, and afterward the judges gave the first place to Mr. Hanchett, of Illinois; second, Mr. Craven, of Iowa; third, Mr. Goodwin, of Indiana. The markings were as follows, 1,200 being perfect: Illinois, 1,128; Iowa, 1,125; Indiana, 1,117; Minnesota, 1,083; Ohio, 1,059; Wisconsin, 1,055. We understand that Mr. Hanchett is a member of the Delta Kappa Epsilon Fraternity; Mr. Craven, Delta Tau Delta; Mr. Goodwin, Phi Delta Theta.

There seems to have arisen a very serious trouble at Ann Arbor in regard to the election of editors of the *Chronicle* for the next half year. At a meeting of the *Chronicle* Association, held

May 20, 1882, one hundred and thirty-two of those who expected to vote were denied that right (we do not know that it was a right), because the managing Board thought that these persons had not become members of the association according to its constitutional provisions. Such confusion then followed that the meeting was adjourned; and at a later one, four editors were elected. The opposing party then issued a circular claiming that "One hundred and thirty-two voters were disfranchised by the acting Board of Editors, in partisan spirit, and in direct violation of the constitution and of all precedent;" and that "*The Chronicle* has been conducted as the organ of a faction, and in a manner not creditable to the University." They also threatened to establish another paper. If those deprived of a vote were all of a party opposed in politics to the managing Board, it would look as though there was ground for complaint, with appearances much against the Board. When the opponents of the Board, however, claim *The Chronicle* has been conducted "in a manner not creditable to the University," we think that they did not judge by comparison with most college papers, or that their ideal is very high. According to our opinion, *The Chronicle* has been ably conducted during the last year, and we hope that this trouble will not affect its successful publication in future.

At the Ohio State University, Columbus, O., the students room in a college building with rent free, but they are obliged to give bonds for the good care of the building. The students form an association and let to some person the job of furnishing and care of the rooms, the kitchen and dining-room work and the care of bath-rooms. The rooms, we understand, are nicely furnished, and this, with the care and heating, costs each student sixty cents per week. The students elect a president, who has his board free. This person purchases all food, and it is prepared for the table at a cost of fifty cents per week to each student. The food costs on an average \$2.40, making the whole cost of board \$2.90.

At Perdue University, La Fayette, Ind., the faculty lets the contract to furnish table-board at \$2.50 per week. The students can board at the college boarding-hall or elsewhere, as they choose. The college charges fifty cents for lights and gives a suite of three rooms to every two students. The rooms are furnished with bedsteads, wash-stands, tables and chairs.

At Ann Arbor the students board in clubs at the cost of from \$2 to \$2.50. A steward purchases the food and is boarded free. The cost of preparing it for the table is fifty cents per week.

At Hillsdale College club board costs this year from \$1.50 to \$2.25. Last year it was as low as \$1.70 in the club where it is now \$2.25. Furnished rooms in dormitories or in private houses (the care is included here) at from thirty-seven to sixty-two cents per week. Board in private families, including care of rooms, is from \$2.50 to \$3.50.

At Olivet College, before the fire, board cost \$2.50.

When we compare our boarding system with those of the other colleges we see how expensive ours is as compared with others. It costs to prepare our food sixty eight cents per week each, fuel used in preparation costs ten cents, making a total of seventy-eight cents per week, as compared with fifty cents in other colleges. Food costs \$2.37, making the entire expense \$3.15, not including furnishing and care of the rooms.

MICHIGAN INTER-COLLEGIATE SOCIETY ASSOCIATION.—The first annual meeting of the M. I. C. S. A. was held at Albion, May 4, 5 and 6, 1882. Delegates present: Rood and Wycoff, Adrian; Des Jardins and Reed, Albion; Bennett and Spalding, Ann Arbor; Pierce and Wheeler, Hillsdale; Beaumont and Holliday, Lansing; Barber and Cooney, Kalamazoo. First session, Thursday afternoon, in Erosophean Hall; acceptance of credentials and reports of standing committees. Second session, Thursday evening; action taken upon regularly offered amendments to constitution; election of officers for next year. Friday morning, session held in College Chapel, new President, L. Cooney, in the chair; this day devoted to presentation and discussion of papers from delegates, upon literary society topics; first paper by W. M. Wycoff, Adrian: "Relation of Literary Society to Actual Life;" second paper by M. O. Reed, Albion: "Aim of Literary Societies;" discussion followed each paper. Afternoon session, first paper by C. H. Gleason, Kalamazoo: "Discipline of Society Work;" second paper, C. R. Wheeler, Hillsdale: "Society and Class;" and third paper, Mr. D. C. Holliday, Lansing: "Workings of Eclectic Society;" an interesting discussion followed; President Fisk, of Albion College, was called upon and responded in an entertaining and instructive manner. Friday evening was held open meeting in College Chapel; programme as follows: Music, "O Restless Sea," Miss Mamie E. Russell, Messrs. Gleason and Russell; introductory remarks by the ex-president, J. W. Beaumont, Lansing; music, violin solo, Prof. N. P. Stanton; essay, "Conscience and Law," E. B. Rood, Adrian; poem, "Night Brings out the Stars," Miss Alba M. Stiles, Albion; music, cornet solo, Louis Boos, Jackson; discussion: question, "Resolved, that immigration of the Chinese into the United States should be restricted by law," affirmative,

J. F. Evert, Lansing; negative, D. P. Sheldon, Kalamazoo; music, piano solo, "Caprice Fantastique," S. F. Garrung, Albion; discussion continued: affirmative, H. E. Spalding, University; negative, C. H. Pierce, Hillsdale; music, vocal solo, Miss Franc Eve Earl, Albion; oration: "Study of Language a Key to History," A. A. Clark, Albion; music, cornet solo, Louis Boos, Jackson; paper: "The League," C. R. Cooley, Hillsdale; music, piano solo, Miss M. Sweet, Adrian; following this was a grand banquet in Erosophean Hall. Saturday morning, session held in parlors of Commercial House; settling of finances and election of standing committees; next year's officers are: President, L. Cooney, Kalamazoo; Vice-President, M. O. Reed, Albion; Secretary, C. H. Pierce, Hillsdale; Treasurer, E. B. Rood, Adrian. Ann Arbor has the chairman of Executive Committee, and Lansing has chairman of Literary Committee, in Mr. Holliday. The first meeting of the association was a success, and proved the usefulness and permanence of the organization. Lansing sent a large delegation—twenty men—and a delegation that did her honor. We have especial reason to be proud of the association, since it may be considered a child of our own, and since it has been pushed to its present success mainly by the energy of our own men.



LIBRARY AND MUSEUM BUILDING.
From the south-west.

College News.

Subscribe for THE SPECULUM—volume two.

The juniors wear a class ring. Sophomores next!

The Phis have lately purchased a fine new upright piano.

The farm department will purchase a twine self-binder soon.

Volume one of THE SPECULUM has been printed at the Post and Tribune Job Rooms, Detroit.

Twenty-eight students will graduate in August. One is a lady.

President Fairchild, of Oberlin, paid Dr. Kedzie a day's visit, May 17.

The botanical laboratory has been repainted, and somewhat repaired.

The college band has lately purchased one of Lyon & Healey's \$165 tubas.

The new tool-house, being erected just south of the horse barn, is enclosed.

The silo is to be considerably enlarged, and the experiments with ensilage continued.

Professors Cook and Carpenter have telephones from their residences to their offices.

The Executive Committee of the State Agricultural Society will visit the college June 8.

The Olivet base ball club expects to play our nine at this place the first of the month.

Rev. Stewart Kedzie, a brother of Dr. Kedzie, from Grand Haven, paid the College a visit, May 21.

The college cornet band made music for the people of Lansing decoration day. The Lansing band has disbanded.

Professor Samuel Dickie, of Albion College, will lecture here before the Y. M. C. A., June 2d, on Robert Burns.

Among other new apparatus in the chemical laboratory is a photographer's camera. It is conspicuous on sunny days.

The experiments on the crossing of corn mentioned before in THE SPECULUM are being extensively continued this year.

The Y. M. C. A. has applied for the old museum room in College Hall. It intends to use it for business meetings, library, etc.

Rev. Dr. Holmes and wife, of Chelsea, made the College a short visit, two weeks since. Mr. Holmes was a classmate of Dr. Kedzie's.

A permanent fee of \$2.25 will be required of the students each term for heat. This item is combined in the accounts with the room rent.

Dr. Beal intends to exhibit the drawings and theses on botany of the seniors and freshmen before the State Teachers' Association next winter.

Our course in English literature is now extended over two years, and essays in connection with the work are required for five consecutive terms.

One of the most attractive portions of the grounds to students and visitors is the wild garden. Considerable improvement is being made this summer.

College Hall will be extensively refitted next year. A new roof will be put on, the walls and floors repaired, and many changes made in the apartments.

J. O. Beal, of Lenawee County, made his brother, Dr. Beal, a visit some time since. He is especially interested in our silo. He is intending to build one this year.

The labor system has become badly demoralized in the horticultural department. It is maintained at its old standard under the management of the farm department.

An accurate life size portrait of Judge Wells, painted by George W. Reed, Kalamazoo, has been procured by the college. It will probably hang in the reading room.

The library is now thoroughly set up in the new rooms in the library and museum building. The books, so crowded in the old room, make a little display in the new one.

We are unavoidably delayed with this issue, as the time of going to press occurred during vacation. LATER.—The proofs were lost in the mails, causing still further delay.

Each table in the analytical rooms of the chemical laboratory has been provided with stools. Those of us who have stood up to three hours of manipulation will appreciate the change.

The farm, and indeed the whole farm department, never looked better than at present. There is order and thrift apparent everywhere; everything shows thought, and good, practical management.

No need of the College is more apparent than a competent superintendence of the horticultural department. The chair of horticulture could be profitably combined with a superintendence of the whole department.

Some time since, the College purchased ten registered Merino ewes of A. D. Taylor, Romeo, for \$300, and a ram of Mr. Thompson, of Macomb Co., for \$75. These sheep are now in excellent condition; some fine lambs are being raised.

Dorr J. Stryker, a student in the class of '85, was quite seriously injured in a ball game, April 8th. An ankle-joint was dislocated, and the leg broken just above. He remained at College, keeping up with his classes; he has now nearly recovered.

Professor Cook's old class-room in College Hall will probably be given to Professor McEwan. It will be united with Professor McEwan's present class-room, the one formerly occupied by Dr. Beal. A private study may be built from a portion of the rooms.

Dr. Kedzie received a few days since a sample of "Palmer's Plant and Vine Protector," for analysis. It is claimed that it protects plants from all insects, and "at the same time invigorates their growth." It contains about seven parts of bran or shorts and one part of cayenne pepper.

Wm. M. Badcock, of Taunton, Somersetshire, England, has come from England for the purpose of studying apiculture under Professor Cook. Mr. Badcock is a banker, but intends to follow bee-keeping hereafter. Miss Belle Smith, of Mosherville, Mich., is taking a similar course under Professor Cook.

The orators for commencement are: Erwin N. Ball, Hamburg; Charles W. Crossman, Benton Harbor; John F. Evert, Moorepark; Jacob M. Hollingsworth, Ridge Farm, Ill.; Jeff. H. Irish, Pontiac; Theodore F. Millspaugh, Walden, N. Y.; Edwin A. Murphy, Lyons, and Charles B. Plummer, South Haven.

There is probably no presentable collection of Indian Corn in the United States. Dr. Beal is making arrangements for exhibiting the large quantity of samples of corn he has now on hand. Two cases for this purpose have been placed in the museum of vegetable products at a cost of \$350.00, and two more will soon be added.

A number of the students have combined in connecting Wells' and Williams' Halls with a telegraph line, and in procuring a number of instruments for the practicing of telegraphy. It is rumored that the operators from the two Halls meet on the lawns at dead of night, to ask each other questions concerning the messages of the day.

The crops on the farm are distributed as follows: No. 3, 15 acres of oats, the remainder devoted to experiments; No. 4, divided into small pastures; No. 5, meadow; No. 6, corn and potatoes; No. 7, pasture; No. 8, clover meadow; No. 9, wheat; No. 10, corn, and eight acres of roots; No. 11, wheat; Nos 12, 13 and 15, pasture; No. 14, meadow.

It is proposed to remove the garden tools from the basement of College Hall, and to erect a small tool-house and store-house for the use of the horticultural department, near the vegetable gardens. If money is obtained, this will be done next year. The using of the present basement for the storing of tools, etc., renders the whole building unhealthy.

A subscription paper has been circulated among the farmers of the vicinity, among the members of the Faculty and business men of the city, for aid in graveling the road between the College and Lansing. About \$900 have been subscribed. The students have promised considerable work. Professor Carpenter will have charge of a part of the work.

No greater improvement is shown in any department of instruction than in the course in anatomy and physiology under Professor Cook. The new dissecting room is convenient and commodious, and the dissections are conducted under a rigid and thorough system. Indeed, the anatomy and physiology is becoming one of the strong points of our institution.

Our flower gardens are every year the delight of visitors, and the pride of the College. They are skillfully managed by Mr. Cassidy. One of the circular plats, twenty-seven feet in diameter, which is each year filled with bright contrasts of foliage, will this year contain eighteen hundred plants, grown in the greenhouse. This plat contains each year one of the "carpet designs," which are so attractive all through the summer.

Dr. Beal has procured an apparatus for testing seeds. It is constructed upon the plan of an incubator. The extensive experiments on the testing of seeds carried on in the past will be continued. Samples of vegetable seeds from the different seed houses are tested, together with those grown upon the College premises. Samples of grass seeds have been tested as to purity. This is done by carefully picking out the weed seeds, and other foreign matter, and then weighing them in delicate scales.

"The Young Ladies' Secret Society" is the name of a late literary organization here by the waiters and kitchen girls. It is just our luck! An editor for THE SPECULUM will be elected from this society, of course, but the present editors will have laid away their broken pens and will be denied the inspiring boon of sitting long at the editorial table beside the fair editress. But we gather consolation from the fact that from turret to basement this is an educational institution. We greet the new comer! Long life and much secrecy!

The experimental plats on the farm will contain, this year, three or four varieties of corn, two varieties of millet and one of Hungarian grass, grown for testing their worth for ensilage; ten varieties of wheat; eight varieties of potatoes, some of them new; a plat of doura, or rice-corn, for ensilage; one-eighth of an acre of yellow lupine, to test its value as a green manure, as compared with clover; and one-eighth acre of each of the following, to test their value for hay and forage: orchard grass, fowl meadow grass, English blue grass, Kentucky blue grass, alfalfa, red-top, white clover, alsike clover, and oat grass.

The farm department has sold five shorthorns this spring, as follows: Cow and heifer to C. A. Miller, Marshall—the cow for \$300, the heifer for \$125; three yearling bulls for \$125 each, to the following gentlemen: William Johnson, Plymouth, Merrit Peckham, Parma, Mich., and Joseph Purves, Burton, Mich. The amount of stock will be increased as the condition of the farm admits. Shorthorns and Ayrshires will be the leading breeds kept. It is the idea of the present management, that the

College should be prepared to furnish the people of the state with pure stock, and to sell them cheap. Stock will be made a specialty. The demand for stock, and especially for shorthorns, is now good.

Much new and expensive apparatus has been added to the chemical and physical department. Among other things is an aneroid barometer, a set of vacuum tubes for illustrating the "fourth state of matter"—the state beyond the gaseous form; Bohnenberger's dry pile, an instrument for illustrating "Arago's rotation," by means of which a magnet is made to revolve in the same direction as a rotating unmagnetic metal; Melloni's complete set of apparatus for illustrating principles of heat; a pyrometer, with bars of the different metals; Edison's phonograph; Duma's apparatus for determining vapor density; Faraday's apparatus for converting electricity into motion; Cailletet's machine for the liquifaction of the so-called permanent gases.

Dr. Kedzie is trying a most novel experiment. He is trying to ascertain the condition of electrical currents in the earth preceding and during storms as a means of foretelling changes of weather. His apparatus consists of a very delicate galvanometer which is connected with trees by wires. These trees being in intimate contact with the earth and being themselves non-generators of electricity afford a ready means for the conduction of the earth's electricity. The experiment is yet too new to bring any definite results, although the deflections of the galvanometer needle correspond to changes in the weather. Dr. Kedzie is the first investigator in the field. The weather department at Washington has obtained information of the experiment and it will probably institute investigations.

Dr. Kedzie is experimenting upon the sources of nitrogen of plants. It is known that the leguminous plants—clover, lupine, peas, beans, etc.—will contain much more nitrogen than cereals grown upon the same ground. Why is it? The soil contains a certain amount of "inert nitrogen"—nitrogen which is inactive and usually considered unavailable for plant food. May it not be that the leguminous plants have the power of utilizing this nitrogen which the cereals have not? The experimental plants are grown upon soil which has been burned to expel the combined nitrogen and are watered with distilled water. If a chemical examination of the mature plants shows any accumulation of nitrogen above that originally contained in the seed it will have come from the inert nitrogen of the soil.

When the alterations in College Hall are completed, and the offices it is to contain are fitted up, the visitors will find the different offices in the following places: President Abbot, Library and Museum building, first floor, south side; Secretary Baird, Library and Museum building, first floor, north side; Professor Kedzie, Chemical Laboratory, south entrance; Professor Cook, Library and Museum building, second floor, front side; Professor Beal, Botanical Laboratory, north entrance; Professor Carpenter, College Hall, second floor, south-east corner; Professor Johnson, College Hall, first floor, north side; Professor MacEwan, College Hall, third floor, south side; Professor Harrower, College Hall, second floor, north-east corner; Frank Kedzie, Chemical Laboratory, north entrance; and all in private offices.

A number of new experiments will be begun by the horticultural department this year, and many of the old ones continued. Besides the extensive testing of seeds to find what per cent. will germinate, many will also be tested to find how high a temperature they will endure, and what variations of temperature will be required to destroy their value. Corns from the northern and southern states will be tested to see if equal temperatures affect them differently. Alternating rows of different vegetables which are treated alike, will be measured to see how the yields compare in quantity. Last year rows of onions side by side, receiving the same cultivation, varied often as much as two bushels in yield. If these rows had been differently fertilized or cultivated, the inference would have been drawn at once, that such fertilization or cultivation was the cause of the difference in yield. Corn will be grown from the upper and lower ears on the stalks to find if there is any difference in the yield. Experiments will be continued with sprouted seeds which have been dried. A kernel of wheat may be sprouted and dried at least three times. Long-keeping specimens of yellow Danvers onions will be grown for a few years to improve their keeping qualities. Similar experiments with the white globe onion have resulted favorably.

The College catalogue for 1882 is out. We unhesitatingly pronounce it the best the College has ever issued. It contains the triennial catalogue, which will hereafter be regularly issued before alumni re-union, instead of after it. Among other new features the catalogue contains an index, an important matter always overlooked before. The degree of Master of Science is given not only after three years' of study, as heretofore, but also after the student has "spent at least one year in the College, in a course of post-graduate study marked out by the faculty in

each case." The triennial catalogue contains a summary of occupations, from which we learn that of the two hundred and thirty living graduates, one hundred and forty-three are engaged in industrial pursuits; ninety-three are farmers. It also gives the residences of graduates. One hundred and seventy reside in Michigan; six in Colorado and in Iowa; five in Kansas, in Missouri, in New York and in Ohio; four in California and in Indiana; three in Dakota; two in Illinois, in Nebraska and in Wisconsin, and one in each of the following: District of Columbia, Florida, Massachusetts, Minnesota, Mississippi, Utah, Virginia, Texas, Washington Territory, Manitoba, and Syria, Asia. The only feature to which we take exception, is the insertion of the stereotyped paragraph concerning our military drill. We have no military drill, and the mere insertion of words to that effect does not satisfy the law.

Professor Johnson is conducting a series of experiments for the purpose of determining the source of the nitrogen supply of field crops. This is one branch of an extensive co-operative experiment initiated and conducted by Professor W. O. Atwater, of the Connecticut Experiment Station. These experiments were begun at this College last year and were mentioned in No. 3 of THE SPECULUM. They consist in the growing of crops on plats fertilized with different nitrogenous fertilizers, and a detailed comparison of the results with those of the same crops grown with other fertilizers. As stated in Professor Atwater's circular, "The object of this experiment is to test the effects of nitrogenous fertilizers in different amounts and combinations upon the growth of the plant, and inferentially its capacity to gather its nitrogen from natural sources. * * * The nitrogen is supplied as nitric acid in nitrate of soda; as ammonia in sulphate of ammonia, and as organic nitrogen in dried blood." Professor Johnson's results, as tabulated in Professor Atwater's report of March, 1882, are as follows, the crop being corn:

No manure.....	44.7	bushels per acre.
Nitrate of soda, 150 lbs.....	53.1	" "
Superphosphate, 300 lbs.....	51.2	" "
Muriate of potash, 150 lbs.....	52.0	" "
Nitrate of soda, 150 lbs.....	61.6	" "
Superphosphate, 300 lbs.....	43.6	" "
Nitrate of soda, 150 lbs.....	43.6	" "
Muriate of potash, 150 lbs.....	59.0	" "
Superphosphate, 300 lbs.....	59.0	" "
Muriate of potash, 150 lbs.....	58.8	" "
Mixed mineral fertilizers (superphosphate, 300 lbs; muriate of potash, 150 lbs.)	58.8	" "
Nitrate of soda, 150 lbs.....	55.6	" "
Mixed mineral fertilizers.....	55.6	" "
Nitrate of soda, 300 lbs.....	49.1	" "
Mixed mineral fertilizers.....	49.1	" "
Nitrate of soda, 450 lbs.....	55.7	" "
Mixed mineral fertilizers.....	55.7	" "
Sulphate of ammonia.....	49.4	" "
Mixed mineral fertilizers.....	49.4	" "
Dried blood, 225 lbs.....	51.6	" "
Mixed mineral fertilizers.....	51.6	" "
Dried blood, 450 lbs.....	61.4	" "
Mixed mineral fertilizers.....	61.4	" "
Dried blood, 675 lbs.....	31.7	" "
No manure.....	31.7	" "

These experiments were conducted upon a level upland, sandy loam, light and well drained. It is noticeable that Professor Johnson reported much larger yields than any other experimenter.

The conclusions at which Professor Atwater arrives, after four years of experimenting, are that "corn was helped but little by nitrogen in the fertilizers," and that "it gathered a good deal from natural sources." Potatoes showed uniformly good results from the use of all the fertilizers. "The experiments indicate very decidedly that the potato plant differs from many others in respect to the effect of these fertilizing materials upon its growth, and imply that it has less capacity than corn for gathering an adequate supply of food from natural sources. It seems to demand a full and immediately available supply of nourishment for its successful growth." With cotton "phosphoric acid has great and potash very little effect. Nitrogen increases the crop; but that in cotton-seed meal is as useful, or more so, than in the other and more costly fertilizers."

E. B. Fairfield, Jr., '71, after graduating read law a few months with S. F. Seager of Lansing; then acted as a legislative correspondent for the Chicago Inter Ocean and other papers. During 1873 he was with the Republic Iron Mining Co., of Marquette Co., Mich; was adjusting agent for the State Fire Insurance Company in 1874-5; dabbled in real estate in Chicago in 1875-6. Since 1876 he has been teaching and is at present Supt. of school at Tecumseh, Mich. He is an officer of the State Teachers' Association and a member of the visiting committee to Battle Creek College. Married Miss Mary L. Jones in '72, who was one of the ladies admitted to the college in 1870.

Personals.

The Editor of this Department desires the earnest co-operation of the alumni in aiding him to fill these columns with interesting items. Give occupation since graduation, what offices held, whether married or not, etc., etc. Let this receive prompt attention from every alumnus. Address communications to A. C. BIRD.

Adams Bayley, '61, is farming near Troy, Mich.

Charles S. Guile is practicing law at Mason, Mich.

Charles F. Shilling, '78, is a clerk in Sturgis, Mich.

Wallace W. Bemis, '76, is a farmer near Ionia, Mich.

A. G. Gulley, '68, will be here to the alumni re-union.

Morse W. Jones, '80, is studying law in St. Paul, Minn.

William Caldwell, '76, is farming near Commerce, Mich.

Henry H. Mills, a special in '75, is a farmer at Joppa, Ind.

Charles McKenny, '81, is teaching school at Dimondale, Mich.

James Doonan, once with '78, is in Stearns' laboratory, Detroit.

Carl Dart, '81, is Assistant Engineer of the City of Lansing, Mich.

Charles D. Sprague, '70, is a prosperous farmer at Greenville, Mich.

J. P. Letts, once with '81, is a student of medicine, at Orion, Mich.

Samuel Fellows, once with '78, is a railroad man at Orion, Mich.

William A. Spencer, once with '76, is a miller, at Orion, Mich.

James P. Lewis, '78, is a prosperous hardware merchant at Firth, Neb.

J. A. Briggs, '79, is in the law office of O. E. Angstrom, '75, at Monroe, Mich.

Charles H. Parker, '75, is a prosperous farmer at Jerome, Hillsdale Co., Mich.

Will S. Holdsworth, '78, is at present a designer and draughtsman, in Chicago, Ill.

W. G. Simonson, '81, is introducing school books in this state for Harper Bros.

Powell Carpenter, one of the earliest students of the College, is a farmer near Orion.

Russell A. Clark, '76, is a lawyer in Lansing. He has a little daughter ten months old.

Arthur Jones, '81, is book keeper in the real estate firm of Jones & Porter, Lansing.

E. B. Fairfield, '71, is one of the special contributors to the Michigan School Moderator.

George B. Hannahs, once with '78, is a prosperous lumber merchant at South Chicago.

C. B. Fisk Bangs, '76, has quit railroading and gone to farming near North Lansing, Mich.

David Strange, '67, and his brother, John D. Strange, '69, are farmers at Grand Ledge, Mich.

Augustus S. Hume, '74, has purchased a farm near Lansing upon which he expects to move soon.

F. B. Dickerson, once with '74, is a prosperous subscription book publisher, Larned street, Detroit.

Charles W. McCurdy, '81, has accepted a position as assistant in the Reform School at Lansing, Mich.

W. L. Cole, once with '78, after graduating at the Detroit Medical College, located at Orion, Mich.

Henry Jenison, '67, is a farmer near Eagle, Mich.; he is also the County Surveyor of Clinton County.

George E. Breck, '78, is now practicing law in Paw Paw, Mich.; he was admitted to the bar last March.

Jay D. Stannard, '76, has purchased a nice farm near White-water, Wis., and will take possession next fall.

Elliot W. Langley, over two years with '81, is a book-keeper in the lumber firm of Fuller and Rice, Grand Rapids.

Joel S. Pardee, '78, has lately graduated from the Chicago Medical College; he is now located at New Troy, Mich.

L. N. B. Ives, once with '79, is with Ives & Sons, bankers, corner of Jefferson avenue and Griswold street, Detroit.

Samuel Hedger, once with '76, and for several years a merchant at South Lyons, has moved to Spink Co., Dakota.

A. J. Pierce, once a member of the class of '69, has left South Haven for Aberdeen, Dakota, where he has taken up land.

T. C. V. Kline, once with '82, recently married Miss Nellie Belles, of Orion, near which place he is engaged in farming.

Barney H. Dyckman, Jr., once with '79, is night clerk in Lytell's Hotel, St. Louis, Mo.; his address is 1019 Olive street.

F. L. Hough, over two years with '79, is engaged in the lumber business at Fruitport, Mich.; he is also quite a land owner.

Edward A. Haven, once with '83, has been sick for some time. He now expects to return next fall, and enter with the class of '84.

George Anderson, once with '81, passed through Mayhew's Business College, and is at present farming near Orion, with his father.

William H. Smith, '75, has given up the South, and gone on a farm recently purchased in this State; his address is Cedar Springs.

We have received notice of the marriage of George Breck, '78, to Miss Belle Dart, of Lansing, the ceremonies to take place June 8th.

Stephen P. Tracy, '76, has just gone into the employ of a wealthy gentleman of Detroit, as superintendent of a large farm property.

Will R. Hubbert, '81, was in a drug store, in Detroit, some time after graduating; he is now engaged in the same business in Minto, Dakota.

Dr. Kedzie will meet the Executive Committee of the National Health Association, of which body he is President, at St. Paul, Minn., June 6th.

A. L. Seeley, formerly with '81, spent the winter at the Detroit Medical College; but is, during the summer, running a lumber yard at Orion, Mich.

J. Bruff Ware, once with the class of '82, was married May 31, to Miss Dora M. Foote; both are from Grand Rapids. We offer congratulations.

David Howell, once with the class of '66, is Superintendent of Schools at Three Rivers, Mich.; he is also Secretary of the State Teachers' Association.

Charles E. Bush, '81, has been at home, in Lansing, sick for several weeks past; he was attacked with rheumatism of the heart, but is now recovering.

Cass E. Herrington, once with the class of '78, is now a promising lawyer in Pontiac, Mich. He graduated in the law department of the University in 1879.

C. B. Collingwood, once with the boys of '83, is on a cattle ranch in Mexico; his address is Santa Maria, Cal. He expects to go to surveying again in the Spring.

Charles E. Hollister, '61, is a farmer at Laingsburg, Shiawassee Co.; he has been a prominent surveyor for some years; he is now Principal of the Laingsburg schools.

We had the pleasure of visiting Mr. Frank P. Hagenbuck, '79, at his residence near Centreville, and he has one of the finest farms in that beautiful portion of Michigan.

T. H. Stevens, nearly three years one of the class of '65, is a farmer in Bath, Clinton Co.; he has been a prominent teacher for some years; he left College to go to the war.

Frank W. Hastings, '78, is postmaster in Saint Louis, Mich.; he has cleared for the office, during the year past, nearly \$2,500; it shows him to be a very efficient public officer.

Warren T. Winslow, who entered with '83, was married to Miss Libbie Sias, a neighbor's daughter, April, 17th. He is farming upon a part of the homestead at Hartford, Mich.

Carlton V. Hinman, '78, after graduating, was for some time a book-keeper; he has lately graduated in the Hahnemann Medical College at Chicago, and is now located at Lansing, Mich.

Richard Haigh, Jr., of South Haven, advertises his fruit farm for sale. He is now a traveling agent for the New York Life Insurance Co. He intends to be with us during alumni re-union.

Adam Groner, who was obliged to leave the junior class of '81 on account of ill health, is now at home at Parkville, St. Joseph Co., studying medicine. Last winter he taught district school. His health is improving.

John A. Porter, '77, is teaching and farming at Longmont, Colorado. On account of his health he is obliged to work at farming some of the time instead of following continuously his old vocation of school teaching.

Wm. H. Burgess, '81, has of late been to work for the Detroit committee distributing money among the fire sufferers of Huron and Sanilac Counties. He is also studying law with the Avery Bro's of Port Huron, Mich.

Warren A. Wells, '68, is just completing the seventh year as principal of the schools at Vicksburg, Mich.; his house was destroyed by fire last February; he lost the whole of his library, and a large collection of insects.

Eva Coryell McBain, '79, and her husband have moved for the present to Grand Rapids. Mr. McBain is book-keeper for the Grand Rapids Plaster Co., and in addition owns and operates a farm at Sparta, Kent Co., Mich.

Harvey L. Rosenberry, '81, is still at Columbus, Ohio. A short time since, he sent to Professor Cook a human viscera, also a foetus which had, in place of the *ductus arteriosus*, a foramen running through the walls of the heart.

P. H. Felker, '71, is now editing "The Grocer," in St. Louis, Mo.; he has lately written a work, entitled "Letters to a Young Merchant, and Talks to Clerks," which gives much information to those who are just starting in business.

Harvey A. Price, '81, traveled in the book business for some time after graduating. Last winter he studied law in Minneapolis, Kan.; he is now sight-seeing in the West. At last accounts, some two weeks since, he was starting on a trip North from Pueblo, Colorado.

S. W. Duncombe, of Paw Paw, entered here in May, 1857, and remained three terms; he has lately been appointed to conduct the United States Land Offices at Aberdeen, Dakota. He has for many years been prominently connected with the county offices of Van Buren Co.

Geo. W. Harrison, '66, after graduating, was a druggist, and later a hardware merchant; he is now manufacturing a wrought-iron rubber-lined knife-head, to be used on reapers and mowers, which, to a great extent, obviates the friction and noise of the machine. His address is Lansing, Mich.

Dwight A. Harrison, '68, for two and a half years after graduating, was in the drug business with Frank Wells, of Lansing. During the nine years following he was a druggist at Williams-ton, Mich. He is now traveling for the firm of Farrand, Williams & Co., wholesale druggists, at Detroit, Mich.

THE SPECULUM is in receipt of an invitation to the marriage of Chas. W. Sheldon, '75, to Miss Helen Parsons, of Burr Oak. The wedding took place May 17. We wish the genial groom and his bride many long and happy years. Mr. Sheldon returned to Fremont, Nebraska, to continue in the stock business.

W. C. Latta, '77, who is assistant in agricultural experiments here at the college, is spending his vacation in visiting the prominent Agricultural Colleges in the middle and eastern states. His trip will be an extended one, thus giving him an excellent chance to study the prominent features of these various schools.

Albert A. Crane, '75, is a promising lawyer at Gaylord, Mich. He was formerly a member of the firm of Cooper & Crane, but is now his own partner in business; he paid the College a short visit in April, but found time to call on THE SPECULUM, and to become a subscriber; he will visit us at the alumni re-union.

Clifford S. Walton, of Bay City, and Thomas H. Rees, of Lansing, members of the class of '85, leave for the West Point military school June 1st, they having received the appointment from their respective representative districts. We are loth to lose two such good students but wish them success as we bid them adieu.

A. B. Simonson, '77, left Minong, Isle Royal, a short time since, to take a post-graduate course in medicine at the Michigan University; he had been there but a few weeks, when he was tendered the position of resident physician at Harper Hospital, Detroit; he accepted, and is now engaged in the performance of his duties.

C. A. Dockstader, of '81, is still at his home in Centreville, one of the prettiest little towns in the state, and, moreover, brim full of the prettiest little dames, too. This is, in all probability, what keeps Dock there so constantly. For the past week he has been boating and visiting friends at Sylvanside Cottage, Island Park, Ind.

Erwin F. Smith, who took a course in botany under Dr. Beal in 1880, is one of the keepers in the Ionia House of Correction; he is one of the authors of the work entitled "Catalogue of Michigan Plants." He is also a special contributor to the Michigan School Moderator. LATER.—Mr. Smith has come to Lansing to accept a lucrative position in the office of the State Board of Health.

Dr. D. C. Hawxhurst, who was a student here in 1865, died last January, of the small-pox, in the pest house at Paris, France; he was formerly a dentist at Battle Creek, Mich., and at one time President of the State Dental Association. Last June he graduated in the Medical Department of the Michigan University, and soon after went to Paris to pursue a special course of medical studies.

Will Pack, a member of '81 for two years, after leaving College removed to Athens, Mich., with his people. His father died soon after; and he took charge of his father's congregation for nearly a year. He then attended school at Valparaiso, Ind.; and is now at his old home, Centreville, occupying the position of foreman of the Centreville knitting factory. C. L. Major, once with '83, is boss spinner in the factory.

Prof. C. E. Bessey has recently met with a severe loss, which calls forth the sympathies of his many botanical friends. On April 8th, a tornado struck the north hall of Iowa Agricultural College, carrying off the roof and crushing in the botanical laboratory, botanical lecture room, and the room in which were the professor's library, cabinet and herbarium. His work is now carried on in another building. The herbarium is saved in packages; but the cases are still in the wrecked building, exposed to rains and storms. The library was mostly saved, but badly hurt by rain, lime and crushing. The building is to be repaired soon, and the professor expects to be back in his old quarters by mid-summer.—*Botanical Gazette*. We learn that other injuries were done to the college.

Josephus F. Groner, '74, graduated in the Medical Department of the University in 1880. Since graduating, he has been practicing medicine in Big Rapids, Mich.; at present, he is physician and surgeon to Mercy Hospital of that city. He has discovered that pilocarpin is a specific remedy for parotitis, and the editor of the *Physician and Surgeon*, who published a full account of Mr. Groner's work, writes him that "some of the best medical journals have copied your article on 'Specific for Parotitis.'" He has also demonstrated the efficacy of chloral hydrate in diphtheria, having used it extensively a year and a half before any case was put on record. Mr. Groner's many friends will be pleased to learn of the success he has attained in less than two years; he was married August 25, 1881.

J. P. Finley, '73, paid the College a short visit some three weeks since; he was on a trip through Michigan and Iowa to study up the tornadoes that had lately passed over those States. Mr. Finley is the man of the weather department who looks after the storms. To this subject he has paid especial attention for some years. He was once sent to France to study storms; when he returned, General Myers at once ordered him on other duty, not allowing him time to work up his observations, as General Myers was opposed to such investigation by Mr. Finley; consequently, his work was suppressed, but under the present incumbent, he is working at the matter again, and will probably publish his researches. Mr. Finley has accepted the oratorship of alumni re-union.

William J. Sessions, '74, after graduating, taught school four months, and the following summer, 1875, worked on his father's farm, in Clinton county, and that October went to Ann Arbor, where he spent one term of six months studying law; the next spring, 1876, passed a legal examination before Judge Lovell, of the 8th judicial circuit at Ionia, and admitted to practice in all the Courts of Michigan. Having a farm of 120 acres, so went to farming in the spring of '76, at which business he continued until August, 1881, when he rented his farm to a brother and moved into Ionia, to engage in the law business; was married in August, 1876. His family consists of wife and girl, nearly two years old.

We had a pleasant call some time since from S. R. King, once with the class of '68. Mr. King is now a resident of this county, his post-office address being Meridian. He is the inventor and patentee of "King's Patent Erector," an ingenious machine for raising the frames of buildings. It has been awarded a silver medal, four diplomas, and several first premiums by agricultural societies and fairs. Mr. K. raised the large College barn, last fall, by this machine. Two brothers of Mr. King entered the College at an early day, one in '58, and one in '59. The latter, Edgar H. King, died in his room in the autumn of '59. This was the first death among the students of the College. The other brother, T. J. King, did not finish his course; he is now a prosperous farmer at Hudson, Mich. These brothers were three out of the first five students to enter from Jackson Co.; one of the remaining two, Mr. Cole, was their cousin; Mr. Cole died before completing his course.

Chas. J. Monroe, of South Haven, entered college when it first opened, in 1857, in the "middle" class, there being at first a matriculation to three different classes. Mr. Monroe was obliged to give up the course after two and a half years, on account of trouble with his eyes. For one year while here he drove an ox team, pulling stumps where the buildings now stand. During the first two years, the students cleared two hundred acres of land. In consequence of the rapid clearing and the breaking of the soil, a great many malarial troubles became prevalent; so much so, that at one time, by actual count, seventy of the one hundred students were unable to attend meals. During the last year of his stay here, Mr. Monroe was engaged with Professor

Prentiss in planning and conducting the vegetable gardens. In the fall, Professor P. was called away, and Mr. M. had entire charge of the gardens. He did the first storing of seeds, arranging them in neat pigeon holes along one side of the room recently vacated by Professor Cook. Mr. Monroe is now one of the prominent men of Van Buren Co.; a large land owner; President of the Bank of Bangor; and stockholder in the South Haven National Bank, of which he was cashier for many years. He owns a pleasant and well improved farm near South Haven, upon which he lives. He says: "I have great faith in the Agricultural College, and I intend that my boys shall attend it." He is a brother of the J. R. Monroe of '78.

We clip the following from an extended article on the Purdue University in the *Indianapolis Sentinel* of April 7: "The department of agriculture and horticulture was formally opened September 1, 1879, and the work of instruction was the first work to be taken into consideration. A three years' course of study was arranged so as to conform to the scientific course already in existence. This course has continued, with slight modification, as at first planned. * * * The department is in a healthy, growing condition, and is destined to be heard from further in a few years, when it shall have developed more fully. It is now less than three years old, and will this year send out its first graduates, and put on file its first set of theses on agriculture. Professor Charles L. Ingersoll, B. S., fills the Chair of Agriculture and Horticulture, and has in addition the immediate charge of the "Experimental Station," and the model farm. He graduated at the Michigan Agricultural College in 1874, and subsequently filled the position of foreman of the farm until 1877, when he was promoted to the Chair of Agriculture, with the supervision of the farm, having won promotion by excellent work both as a student and an officer. His success in this leading Agricultural College of the country secured his appointment to Purdue in 1879. He is filling his difficult position with marked success, and enjoys in a high degree the confidence of the State Societies of Agriculture and Horticulture, and of the representative agriculturists of the State. The Experimental Station has already attracted the attention of those who have charge of similar departments, not only in this country, but also in Canada and England. Professor Ingersoll is taking an active part in the Farmers' Institute, recently organized under the direction of the State Board of Agriculture. He has his hands full, but his industry and skill seem fully equal to the important work committed to him. Mr. R. H. McDowell, the present foreman of the farm, formerly held a similar position in the Michigan Agricultural College, under Professor Ingersoll. He has been here since the 1st of March, and is believed to be a valuable man for the position." The article also mentions a book-keeping class ably conducted by E. C. White. Mr. White was a former member of our present senior class.

We have the following items of interest concerning persons formerly connected with the College: Louis R. Fisk, Professor of Chemistry from 1857 to 1863, is President of Albion College; Prof. Manly Miles is Director of Experiments on Houghton farm, Mountainville, Orange Co., N. Y. This farm is owned by Mr. Lawson Valentine. Dr. Miles is in constant correspondence with Lawes and Gilbert, of Rothamstead, England, and with other experimenters. John C. Holmes, Professor of Horticulture from '57 to '62, is a wealthy citizen of Detroit. His address is 41 Moffat Block. Prof. Holmes was the most active mover in the foundation of the College. He was for several years the Secretary of the Michigan State Agricultural Society, from its organization in 1849. Calvin Tracy, Professor of Mathematics three years, from 1857, is a resident of Lansing. Before he became connected with the College, he wrote an arithmetic, which was the first to give prominence to cancellation. Prof. Tracy was very fond of hunting while he was at the college; one of his prizes was a fine deer, shot near the present dam across the Cedar. James Bayley, Superintendent of the farm, '60 to '62, is a resident of Birmingham, Mich. His son, Adams Bailey, '61, lives upon the homestead. Cleveland Abbé, Instructor in Civil Engineering in 1859 and '60, obtained the assistantship in civil engineering at the University soon after leaving the college. Later, he became Director of the Cincinnati Astronomical Observatory. He was sent by the Government to study the observations and apparatus of the noted institutions of Europe. He is now the scientific meteorologist of the signal service department; he is the only man in the department who is not a member of the army. Robert H. Tripp, Instructor in the Preparatory Department, 1859 and '60, was Professor of Latin in the University of Minnesota until he lately accepted a similar position in Central University, Pella, Iowa. Carlos A. Kenaston, Instructor in the Preparatory Department from '62 to '65, is Professor of Mathematics at Ripon, Wis. Secretary William H. Marston, '73 to '75, is an editor at Benton Harbor, Mich. John G. Ramsdell, Instructor in Book-keeping and Commercial Law, '61, is the Judge Ramsdell of Traverse City. H. D. Bartholomew, Instructor in Book-keep-

ing and Commercial Practice, '64, is City Engineer in Lansing. The following foremen of the farm are farmers: Hiram Hodges, '57 to '59, Mason, Mich.; Willard K. Norris, '71 to '73, Vermontville, Mich.; George W. White, '76 to '79, Muscotah, Atchinson Co., Kansas.

Reviews.

Books will be received for review in this department. No book reviewed, unless a copy is sent to the editor of this department.

EXPERIMENTS WITH ENSILAGE AT THE AGRICULTURAL COLLEGE, LANSING, 1881 and 1882. By Professor Johnson, of whom copies can be obtained.

This is a neat pamphlet of sixteen pages, giving the results of careful experiments on ensilage, under the charge of the farm department; it also contains a bulletin of the New Jersey Experimental Station for comparison. The very general interest awakened in the making of ensilage, has called forth experiments from a number of well-known experimental stations, not the least of which is our own farm department. Our experiments have been conducted with much accuracy of detail, and this pamphlet gives all that is desirable for any farmer to know of our present knowledge of the subject. The silo is 14x15 feet, with thick stone walls 8 feet high. The total cost of construction was \$151.80; the cost of raising the corn and placing it in the silo was \$41.81, or \$2.09 per ton. The silo was closed by planks on top, weighted with nine hundred pounds of stone to the square yard; the whole was kept as nearly as possible air-tight. There was no outward sign of any change going on within the silo. On December 15 the silo was opened, and the ensilage found to be nicely preserved. Is slightly acid in taste, quite brown in color when first taken from the silo, but after exposure to the air for a short time, regained largely its fresh green appearance. The cattle from the start, with a few exceptions, ate it with avidity. One very important consideration concerning the value of ensilage is the fact that so large an amount of it can be packed in a comparatively small space. A cubic foot of ensilage weighed thirty-five pounds; the fodder was cut by an ordinary feed cutter before being placed in the silo. The pamphlet gives in detail the tabulated results of the feeding. Many of the most important results were given in the last SPECULUM. We quote the following, relating to the comparative feeding and cost value of ensilage:

"The meal fed to the cows is worth \$32.40 per ton. That fed to the bull calves, \$25. Hay is worth \$10, and cornstalks and oat straw each \$5 per ton, and rutabagas 40 cents per bushel. Compared with other feeds at the above rates, the ensilage has a feeding value four times the cost of growing the crop and putting it into the silo. I was not at all sanguine, when we began the experiment, as to the decided merits of ensilage as claimed by many writers, but I have been greatly pleased with the results of the feeding. The convenience in handling the prepared fodder; the large amount that can be stored in a small space; the avidity with which cattle eat it, and thrive and grow when a meal ration is fed with it; the fact that it can be stored in a wet time, during lowery weather, when fodder could not be cured; the furnishing of succulent food for stock during our long winters at very small cost - these are some of the reasons that lead me to think the ensilaging of corn especially will prove to be a practical and profitable method of preparing food for stock. I think it may take the place of roots, and be a cheap substitute for them. I am disposed to believe that the best results will be secured by feeding one daily ration of dry fodder in connection with the ensilage. The experiment shows that it is not a complete food ration."

A POPULAR CALIFORNIA FLORA. By Volney Rattan. Third edition. San Francisco: A. L. Bancroft and Co. 1882.

This little work of 138 pages is intended for beginners in western California. The author begins, in a plain way, with text and illustrations of seedling plants. He goes back a little to consider the seed. The illustrations are good, and many of them new. The structure of the leaves, stems and flowers follow next. Then he devotes a few pages to systematic botany, to prepare the student for analyzing plants and finding their names by the key descriptions. No attempt is made to make the student familiar with some of the most difficult natural orders, such as umbelliferae, compositae, cupuliferae, salicaceae, coniferae, cyperaceae, grammae. The author has done what he attempted, and has done it well.

LIFE; TEMPORAL AND ETERNAL: An Essay from the Second Edition of "Eternal Purpose." By William R. Hart. J. B. Lippincott & Co.: Philadelphia, Pa. 1882.

A friend of the author has sent us a copy of the essay. Thinking some of the views "unsound," some time ago this friend wrote for our opinion on certain scientific points.

Mr. Hart says: "I have thought it advisable to go a little outside of my original plan, which confined me to the presentation of the testimony of revelation, and in issuing a second edition of 'Eternal Purpose,' to glance at man's claim to immortality in the light of reason.

"Let us consider some natural analogies. Take, for instance, an acorn; cut it open; it shows nothing, to sight or touch, of the oak tree which it contains. Subject it to chemical analysis, and you find a few well-known elements. Put it in the ground and it will grow, and in time becomes a mighty oak; but neither microscopic inspection, or chemical analysis can tell what makes it grow. There is one condition antecedent to its growth, and that is that while it was yet a flower, and before it was an acorn at all, the pollen of a male flower must have lodged within it, and have become incorporated with it. If you compare an acorn which has thus been impregnated, with one which has not, you cannot possibly discover the difference; and yet, there is the greatest possible difference. The unimpregnated acorn, if put into the ground, will only rot and perish; the impregnated acorn, while rotting and perishing as to its own identity, will live again in an oak tree. The future oak tree is in the acorn. The tree itself, as to the essence of its being, is as real before the acorn is planted, as when it is manifested in the century-old oak. The life in the acorn is, therefore, *substance*, i. e., that which is real, and in which properties inhere; it is really the oak which is to be. The visible, material tree, is only organized matter."

Again, he says: "I do not overlook the distinction between vegetable and animal life; that the first absorbs carbonic acid gas and gives out oxygen, while this process is reversed with the second. Yet, it has so far been found impossible to discover where the one ends and the other begins."

The acorn-and-oak illustration needs no comments to any who are well grounded in vegetable physiology. What is an unimpregnated acorn? Some parts of most plants give out oxygen; this is about as far as we can go and tell the truth in this matter.

"Matter, force, and life are a trinity, reflecting their creator. The third constituent of this trinity is life; this appears to be as universally present as force and matter. When one form of life has been destroyed, another takes its place. When, for instance, a forest of pines has been destroyed, another, not of pines, but of oak and chestnut, springs up in its room. It does not appear, as the result of a great number of observations, that by the so-called process of nature, acorns and chestnuts were planted after the destruction of the pine trees, but rather that the germinal principle was in the ground, waiting for the proper conditions to develop it. A multitude of similar instances of the spontaneous growth of new vegetation, replacing that which had been burned or otherwise destroyed, are cited by observers. Where earth has been brought up, as in the digging of a well, from a depth of many feet, and from a place where it has not been disturbed perhaps for milleniums, and is exposed to climatic influences, it begins to develop life. But this life is not, as might have been supposed, the result of seeds lodged in from surrounding vegetation. This newly exposed and subterranean earth differs from the surface soil, and will not nourish the vegetation peculiar to the latter; it brings forth another form of vegetation quite peculiar to itself, and different from that around it. *Life* was there, invisible and immaterial, but nevertheless *there*."

The writer of this review has known of numerous instances in Southern Michigan, where fires set by the Indians annually destroyed or kept out, or kept back, all trees and shrubs; when the fires ceased, trees and shrubs came up in abundance, but they were *not unlike* those in the neighborhood. Not a chestnut, not a pine was ever known in such growth in that locality. He has "botanized" all over many door-yards in the vicinity of wells and cellars, in four or more States, and has yet to find the first new plant in those places; they were common weeds or plants native to the neighborhood. The testimony of one good botanist in such matters is worth more than that of a thousand "observers," who have not learned to carefully distinguish plants.

The writer has known five named sorts of our ornamental plants to be planted, and thrive quite nicely, in soil taken from the sand found at the bottom of a deep well. It is really too bad in Mr. Hart, not to allow our native plants to grow in the soil taken from wells, and then to cut off all desire for seeds of pines to grow and produce pine trees, when the large pines are cleared away. This is carrying the thing too far. Farther on, he says: "The law is universal, that 'like produces like.' You cannot develop grapes from thorns, or figs from thistles." Many of the "observers" who say that new species spring from soil taken from wells, and that forest trees grow without sprouts or seeds, believe that horse lines will turn to worms, and many of them *know* that wheat will turn to chess.

The author, like other ministers, no doubt earnestly strives to do good. Who that has a fundamental knowledge of botany or zoology, or has made careful experiments in agriculture, can have confidence in the theology preached by a man in the pulpit, when he attempts to reason on statements as poorly supported as are those used in the above illustrations?

Nature furnishes an endless number of interesting, varied, and pointed examples for illustrating sermons and religious essays; to influence those in the pews, it is very important that these illustrations be correct, and not mere fancies of the imagination.

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