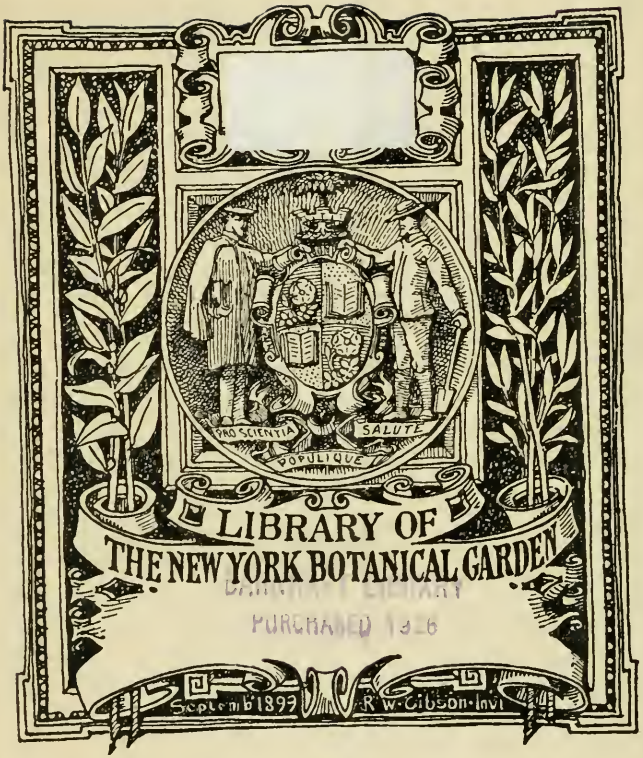

PRO SCIENTIA
SALUTE
POPULIQUE
LIBRARY OF
THE NEW YORK BOTANICAL GARDEN
PURCHASED 1916
Septemb 1899
R W Gibson Invt

THE

Literary Record and Journal

OF THE

LINNAEAN ASSOCIATION OF PENNSYLVANIA COLLEGE.

CONDUCTED BY A COMMITTEE OF THE ASSOCIATION.

VOLUME II.

B

Gettysburg:
PRINTED BY H. C. NEINSTEDT.
1845–46.

VOLUME II.] [NUMBER 1.

THE

LITERARY RECORD AND JOURNAL

Of the Linnaean Association of Pennsylvania College.

NOVEMBER, 1845.

CONDUCTED

By a Committee of the Association.

CONTENTS.

1½ sheet, periodical—Postage, 2½ cents, to any distance within the Union.

NEINSTEDT, PRINTER, GETTYSBURG.

THE LITERARY

RECORD AND JOURNAL

OF THE LINNÆAN ASSOCIATION OF PENNSYLVANIA COLLEGE.

Vol. II. NOVEMBER, 1845. No. 1.

SECOND VOLUME OF THE RECORD AND JOURNAL.

The Linnaean Association having determined to continue the publication of the "Record and Journal," it is our duty once more to bespeak for it public attention and patronage. We do this the more willingly, as "the public" whom we address is not to us a "hundred headed monster" of whose nature we are ignorant and whose passions we fear we may exite even when we attempt to gratify its appetite. *Our* public is a very limited one, consisting of less than five hundred subscribers with nearly every one of whom we have something like personal acquaintance. We are, therefore, at no loss to understand what their wants are, what it is that they expect from this Magazine which they have called into existence and which, we believe, they are determined to sustain. To speak plainly, we know that our readers desire to cultivate literature and science, and expect us to furnish them with some of the supplies of this kind which they require.

But we cannot flatter ourselves that we have in all respects met the wishes and expectations of our friends. There are two causes of this, the one in our readers, the other in ourselves. Even with our limited public the old copy is true, "*Many men, many minds.*" Some of our readers prefer one department of literature, some an other. Our young friends particularly think that we give them too much that is of a dry and scientific character, and would rather have a larger, a much larger amount of lighter literature. On the other hand, our older savans think that we are rather light and superficial, and would prefer that we should go into all the profundities and details of their favorite sciences whether physical or mathematical. How are we to reconcile both these parties? Simply by reminding them of the title and design of this publication. Observe, gentlemen, if you please, we edit the "*Literary* Record *and* Journal of the *Linnaean* Association." This binds us to keep in view *both* Literature and Science. The Linnaean Association was organized

for the cultivation of "Natural Science," and its organ must be faithful to its principles, and endeavor in every way to promote that knowledge the importance of which no one denies. Science, natural science, is therefore, one of the primary objects of this Journal. But, on the other hand, literature is not only a necessary means of attaining this end, and a natural want of the great mass of those for whom we labor, but likewise an avowed and prominent object of the "Record." We do not think that these two objects are at all inconsistent with each other, but are persuaded that they may be prosecuted together with mutual advantage. Literature should enliven and embellish science, science must give direction and value to literature. It shall be our earnest endeavor to satisfy both parties by giving to both departments of the work equal attention, and urging our literary contributors to be *more literary;* our scientific ones *more scientific.*

As to the other category of difficulties in which we find ourselves, we are determined in the current volume to remove all ground of dissatisfaction which we know has been felt, if no where else, yet in our own editorial singular-plurality. We therefore, give place to an other Editor for whom, as it will now no longer be necessary for ourselves, we beg the indulgence of our readers. That our successor will conduct the paper to the satisfaction of all *reasonable* readers we have no doubt, as his communications were among the most popular articles in the preceding volume. At the same time, in his name, we request all our correspondents, for whose co-operation we herewith return our grateful acknowledgements, to continue to assist him in the same effective manner. We also hope that the number of our correspondents and the frequency of their communications will be increased as the want of original matter has been one of the main difficulties which we have encountered in the management of this enterprise. If he can only draw out a reasonable amount of the literary and scientific resources which we know to exist among the friends of the Journal, we have no doubt that our successor will make it one of the most interesting and valuable publication of the day.

One more suggestion and we throw away the pen editorial. *Five hundred subscribers* is too small a number for so excellent a Magazine as ours is to be, to say nothing of what it has been. We therefore urge all our friends who show by their continued support that they approve of this enterprise, (nearly every one of them has *paid our printer*, and we doubt not that they *will all* do so,) each to forward us at once just such another patron as himself. This will enable the Publishing Com-

mittee to enlarge the Journal somewhat, and will furnish the Association with increased means of carrying on its operations—both of which objects are highly desirable.

THE INFLUENCE OF TONES OF VOICE UPON THE FEELINGS.

The natural symbols of feeling are muscular actions of the countenance, tones, and gestures. These, sometimes separately, but oftener conjointly, indicate the state of the speaker's mind. It is proposed at present to consider *the influence of tones of voice upon the feelings.*

It is hardly necessary to say that agreeable tones are all musical, and that oratory and music address themselves to the same principles of our nature. Speech and music are composed of the same elements, and have a common origin. To appreciate the influence of tones of voice upon the feelings, it may be proper to notice their fitness to produce organic pleasure, to awaken associations, and to express the sentiments and feelings of the speaker.

As to the organic pleasure which the tones of voice are fitted to produce, it is obvious that most persons do love euphony, and derive much gratification from it. Though the cultivated ear alone can fully appreciate melodious sounds; yet all men, except those whose organs are naturally defective, or have in some way been impaired, can and do distinguish between different sounds. All feel that there is a difference between concords and discords. Even men of fierce and warlike dispositions have been found susceptible of the "concord of sweet sounds." The cruel Nero was exceedingly fond of music, and devoted much time to its cultivation. And Napoleon, notwithstanding his warlike character, had an ear for music as well as for the clangor of martial instruments. He often spoke of his relish for tender music; and he evinced his zeal for musical science by establishing in Paris an academy for the promotion of it. Not only so—even irrational animals are not insensible to the charms of natural and melodious tones. It is said that Garrick's dog used to be a regular attendant at the theatre, and evinced as much delight as any other spectator when he heard his master's voice. And professor Metoxa, of Rome, states, that in 1822, he saw a company of snakes wrought up to a high pitch of excitement by the tones of an organ. Some of them seemed to be charmed, and turned towards the instrument. These facts are sufficient to show that it is not through the medium of philosophic speculation or cold deduction, that we learn to delight in euphony. There is often a real pleasure in the feelings which the tones of the voice excite, considered as distinct from any sentiment

expressed. Madame de Staël was in the habit of reciting certain stanzas, simply for the sake of the agreeable succession of sounds. "*That* is what *I* call poetry!" said she. "It is delicious! and so much the more, as it does not convey a single idea to me." Though we cannot agree with this gifted lady in her opinion of poetry, we can readily conceive of the pleasurable feelings she describes as being produced by a succession of melodious sounds.

Some of the readers of this article have possibly known men who were indebted for their success as public speakers to a well cultivated voice. There is a preacher now living in one of the Middle States, who ten or twelve years ago drew admiring crowds to hear him. He has no advantages of person—his gestures are rather awkward than otherwise. The matter of his discourses is exceedingly meagre. In brief, the man himself is as "a root out of dry ground," and his sermons are literally "without form and void." But there is a witchery in the tones of his voice. At times his intonations are peculiarly happy—sweet as the sounds that issued from the warbling fount of Chindara. We may wonder why people flock to hear such a preacher. We may say he does not feed them with knowledge and understanding. But then we forget that there is an occult power in a smooth, full, melodious voice which it is not easy to resist.

Of the multitudes who crowded to hear Whitefield, there were many doubtless who cared not for the doctrines he taught or the duties he urged; but they were charmed with the melody of his tones. "He was unto them as a very lovely sound of one that hath a pleasant voice, and can play well on an instrument: for they heard his words, but did them not." We need not feel surprised at this; for the charms of eloquence and music are still the same.

> "Oh Music! thy celestial claim
> Is *still* resistless, still the same;
> And, faithful as the mighty sea
> To the pale star that o'er its realms presides,
> The spell-bound tides
> Of human passions rise and fall from thee."

As to those who can derive no delight from melodious sounds, I will not class them with that sect of ancient philosophers, who valued themselves for their contempt of the arts and sciences; I will not call them *Cynics*, nor say with Shakespeare,

> "The man that hath no music in himself,
> Nor is not moved with concord of sweet sounds,
> Is fit for treasons, stratagems, and spoils."

If there be such, they deserve our sympathy more than our censure.

But tones of voice are fitted not only to please the ear, but *to awaken associations of ideas.* A single tone will sometimes unlock the treasures of memory, and open to us scenes as vivid as when first viewed, and sensations as fresh as when first felt. When exiled from his country and friends, and wandering in a foreign land, what will so awaken in the patriot's bosom reminiscences of his home, and so rouse up the slumbering instinct of patriotism, as to listen to a popular air of his native country? The Swiss recruits in the French army were so much excited on hearing a simple national melody of theirs, that to prevent desertion it became necessary to give orders that it should no longer be played or sung.—In the last campaign of Napoleon, the French army had been repulsed in three successive attacks, and had at length become dispirited and appalled. Re-inforcements could not be procured, and to abandon the enterprize was to lose all. What measure could then be adopted that was likely to secure success? Promises of reward and menaces of punishment were equally vain. Music was the last resort on which Napoleon could rely. He ordered the Marseilles Hymn to be sung. For years this air of liberty, this tune which had led the march of so many victories, had not been heard. The effect was instantaneous and thrilling. It revived the flagging courage and hopes of the soldiers. They rallied, and rushed to the battle-field, and won the victory.

But the most important aspect in which we can view the tones of the human voice, is *as symbols of the thoughts and emotions of the speaker.* There is one, and but one universal language—the language of the passions. The tones which express fear, hatred, love, grief, anger, and other passions, are essentially the same in every clime.

A knowledge of the functions of the voice is doubtless useful for certain purposes; but mere knowledge never made any man a good speaker. It is one thing to know what tones are, and quite another to be able to utter them. An orator may be a critic, but every critic is not an orator. In reading a tragedy, for instance, we, from habit and from our very constitution, imagine how the impassioned parts of it should be spoken; but when we attempt to utter them thus we are immediately embarrassed. The necessity of uttering emotions in articulate sounds, imposes not a little restraint on most speakers. Language itself is an imperfect instrument; and no man has an imagination so powerful, a command of language so perfect, a self-possession so complete, as not to be somewhat fettered in giving vocal expression to his feelings. And just in proportion as he fails to express his own emotions, will he fail to move his hearers. Another cause of unsuccessfulness in awakening emotion, is that the speaker himself is languid and uninterested. He

fails, not for want of power to express his emotions, but because he has none to express. There is much truth in the answer of Red Jacket, the Indian Chief, when called a warrior: "A warrior!" said he, "I am an *orator*. I was *born* an orator." Oratory has its residence in the soul. It is the offspring of deep emotion.

The rate of utterance will usually indicate the strength of the feelings. Strong emotions pour themselves forth in eruptions. "Robert Hall," it is said, "in his vehement passages would utter forty words in a breath, with a velocity that no short-hand writer could catch." Some men habituate themselves to speaking fast; in such cases the rapidity of utterance is no proper test of feeling.

No orator was ever more perfectly natural in his delivery than Patrick Henry, and the most common thoughts when uttered by him, had freshness, vividness, and power. Henry was once walking in company with a friend in the suburbs of Richmond, at the time of a great drought. "It is very dry," said his friend. "It is very dry," reiterated Henry, with an intonation and an emphasis so peculiar and forcible, that his friend felt as if the earth was about to be burned up with fervent heat.

Whitefield was once preaching on "*the wrath to come*." Addressing himself to the impenitent, he said, "O the wrath to come! the wrath to come!!" His audience were completely overpowered. This single exclamation, uttered as he uttered it, was sufficient to thrill and melt every heart.

Without extending my remarks or multiplying my illustrations, we may conclude, then, that when the thoughts come "warm from the heart and faithful to its fires," the tones of voice will instinctively be natural and impressive.

The thoughts which have been presented may suggest *the importance of delivery*. A good elocution increases our influence over our fellow-men. It is an instrument of tremendous power. The vulgar look on an orator as a supernatural being. And yet there are many public speakers who have good thoughts, and a good style, but their influence is very limited and feeble, because their elocution is bad. And the reason of this defect in most cases is, not that the organs of speech are wanting, or are imperfect, but due care has not been used in their cultivation. I know not how it is with gentlemen of the legal profession, but many ministers seem averse to giving much attention to elocution, because, as they say, *truth* alone is the instrument of God in saving men. Paul may plant, and Apollos may water; but the increase can come only from God. But is it not the preacher's business to *communicate* truth, and impress it on his hearers? Is not preaching the di-

vinely appointed means of solvation? And after God has appointed means, and enjoined the faithful use of them, what reason have we to believe he will give his blessing without them, or excuse our neglect of them? It is true, that neither he that planteth, nor he that watereth, is any thing in the sense of being *the author* of salvation; but both are indispensable as instruments. And it is a settled principle of the divine administration, that "as a man soweth, so shall he reap." The harvest usually corresponds, in kind and quantity, to the seed sown, and the husbandry employed. Few indeed are capable of the highest grade of eloquence; but the majority of speakers may acquire the power and habit of judiciously selecting their topics, clearly arranging their thoughts, and impressively and fervently expressing their sentiments in distinct, appropriate, and agreeable tones. This is what I call eloquence. It is just such eloquence as is needed in the pulpit and at the bar; and it cannot be obtained without a careful culture of the voice.

J. R. K.

New Germantown, N. J. Aug. 22, 1845.

RAVAGES OF THE APATE BASILLARIS.

To-day a gentleman brought five or six specimens of an insect, which he discovered committing serious depredations upon young trees of firm texture, by *boring* into them and forming a clean orifice corresponding to the size of the animal. He presumed that this insect might eventually so interfere with the proper communication of the vital fluids as to destroy the life of the tree. He desired some information on the nature of the animal, including its name, order, and history, which I briefly gave him, but shall now enlarge upon in this communication.

The insect belongs to that class familiarly called *bark beetles*, which are capable of doing extensive mischief, and the congeners of which, in some parts of the world, have been the terror of the husbandman, in destroying immense numbers of forest and ornamental trees. It is a *coleopterous* or hard winged insect; not quite half an inch long, the body is nearly cylindrical, the head rounded, almost globular, and capable of being received into the thorax as far as the eyes; the thorax is more or less convex before, and forms a sort of hood; the color is dark ferruginous, approaching to black, with two reddish spots at the base of the elytra; the elytra at their termination appear to be cut out, and have six or seven irregular teeth, so that the whole of the abdomen is not covered,—the mouth is covered with horny mandibles, and each foot has a sharp claw. It belongs to the genus *Apate*, and the species under

consideration is *A. basillaris.* It is ranged under the family *Xylophagi (wood-eaters:)*—There are seven or eight species in this country, some of which are not more than one line in length.

I am not aware that this insect has ever occasioned *extensive* injury in this country, although it is capable of committing terrible havoc, as the history of its congeners in Europe abundantly shows. In May the *Apates* which have come to maturity during the winter under the bark of trees, eat a passage out to the surface. Towards evening they can be seen, either singly, or in years favorable to their propagation, in great numbers on the limbs. When the weather is cool, they do not stir about, but when it is pleasant, they fly off and perform all offices necessary to perpetuate the race. After this, each pair seeks a proper place to deposit the eggs, and usually selects a tree that has lately fallen, or in the absence of this, a fresh, sound tree, and commences eating into it between the scales of the bark. The sap of the trunk sometimes suffocates the depredator, and hence, he usually prefers the limbs in which the succulent matter is not so abundant. His gnawings can be heard, and the falling dust betrays his mischievous operations. After a few days a straight groove can be observed, if the bark be removed.—On both sides of this *deep cut*, in small lateral branches or expansions leading out from the main stem, the female lays her eggs, from sixty to eighty, each separately, and covers it with dust. After this, the parents, if they have not been overtaken by death, bore themselves out again, and leave the *larva*, which is soon hatched, to carry on the work of mischief. It is the *larvæ* which commit the ravages on the trees, and not the perfect insect. The latter does no more than merely excavate the groove, and soon after dies. The larva or grub, is furnished with instruments proper for the work—the mandibles are strong and the claws of the feet are sharp. Each one commences operations and eats a passage through the wood in serpentine grooves, which are widened in proportion as the animal grows. It is curious that some species of this insect never interfere with or cross each other's track in their *subcuticular* excavations,—each labors for himself without incommoding his neighbor, and thus peace is maintained. In a few weeks the larvæ enter the *pupa* state, during which state they are exceedingly tender, so that a season of unfavorable weather may destroy millions. When the weather is propitious, all the periods from the egg to the perfect insect may be passed in two months; but if the eggs are laid in the fall of the year, the metamorphosis is not completed until the ensuing spring. When the perfect insect has broken through the shell of the pupa, he bores himself out to the surface, and is ready to perform the service

to which he was destined by nature. When many small holes are observed on the surface of a tree, it is a proof that the perfect insects have left it; but where few holes are seen, it shows that the robber has just entered. His vitality is astonishing; you may cut down the tree which he has attacked, immerse it in water, and cover it with snow or ice, and the villainous marauder will continue fresh and vigorous.

I said that the injury which this insect is capable of doing, has been grievously felt in Europe. Nearly all the large German forests have suffered from what is called the *worm rot*, and in the old prayer books, these insects as well as the Turks, are devoutly commended to the exterminating vengeance of Divine Providence. Even as early as 1665, their ravages were alarming, and at that time the only secure method of saving the wood was adopted, of cutting down the trees as soon as attacked and removing all the bark. In the beginning of the last century, this *plague* raged for several years successively in the Hartz mountains, and it reached such a fearful height in 1769, that whole forests lost their foliage by the death of the trees. In 1775—1777, it was still worse, but instead of seeking some remedy, naturalists learnedly discussed the question, whether the insect was the *cause* or *consequence* of the calamity. The fanatical thought that this judgment of heaven ought to be endured with pious resignation, and many discovered that it had been prognosticated by the last comet! In 1778, the *plague* somewhat abated, but the next year, after a dry summer, it increased again most awfully. The inhabitants of the Hartz were threatened with destruction, as it was supposed that their mining operations would necessarily stop. Various remedies were suggested; the pastors advised a fast-day; the apothecaries recommended a succession of cathartic powders which would create a contagions diarrhea, and thus exterminate the intruders; a philosopher proposed to kill millions of them by an electric shock; one was for cutting off the trees at the top of the trunk, and another for burning down the forests. Finally an expedient was adopted, which, if it had been applied at an earlier period, would have diminished the evil. All the wood attacked by the insect was put to some use, instead of being suffered to lie and breed the enemy. Immense quantities of charcoal were burnt, saw mills were built, and all other means employed for putting the wood to some proper use. In subsequent years, similar scenes were witnessed in Europe, and no efficient remedy has been discovered. May our forests ever be preserved from the incurable ravages of this noxious beetle! J. G. M.

ENGLISH MODE OF TRANSPLANTING LARGE TREES.

The Linnaeans deserve much credit for planting so many healthy trees in the front campus of the College; but some of them will be old men before the trees have grown large enough to afford much shade. Still it is well to labor for posterity, but I would respectfully suggest to them the expediency of trying the method successfully adopted in England of transplanting very large trees, so that in a year or two they might have a full grown forest adorning that place. Let it be tried in the back campus, so that if it does fail, nothing would be lost by the room or by the breaking up of the ground.

The plan is this: A large healthy tree is selected; all the earth round the roots is removed; all the side roots are then cut and the tree is bent over far enough to enable you to cut off the principal or heart root. The tree is then raised to its former position, the earth is thrown on it again, and it is permitted to stand until the next year or longer. By that time new roots are grown, and then it is transplanted to any place you desire. An English gardener once told me that this plan would never succeed in this country, owing to the prevalence of northern winds, which would shake the tree too much before it had acquired firmness in its new bed, but that might be obviated by props if the tree were not too large.

At Pottsdam, in Prussia, the following mode has been employed with success: A hole was dug proportionate to the size of the roots. In this hole, water, mixed with earth was poured, until it became literally a *mud hole*. The tree was placed in this hole, and about the roots it was protected against the sun and heat. It was surrounded by props so that the wind could not shake it injuriously.

These experiments are worth trying, and I cannot imagine a more invigorating Saturday afternoon's experiment than this. I should suppose that this was about the proper time of the year also, but of that Prof. J. knows more than I. Let's try it, Linnaeans!—In the woods behind the College just by the road are some fine vigorous trees, and I know the proprietor will cheerfully give us permission to experiment on a few.

I have seen a plan to promote the growth of trees, which may not be altogether unworthy of trial. Young trees of several inches thickness are rubbed several times in the year with an old rag. It has this effect: it removes all the parasitic moss which retards the growth of the tree—it sets the sap in more rapid motion, and opens the *pores* of the tree's *skin*, and thus makes it more healthy, (hence white-washing trees

is one of the most unphilosophical capers a man can be guilty of.) This operation is regarded by some as producing an electrical effect on the tree, inasmuch as the operator communicates to it his own superfluous electricity. It is well known that the electric fluid mechanically applied to the vegetation of any root, promotes its growth amazingly.

DENDROPHILOS.

THE MUSINGS OF AN OLD TREE.

According to Esop, in olden times men were not the only creatures gifted with speech. Besides the authority of Fable I have had the testimony of a Dream to convince me that *Trees* can talk and think.—Some years ago, I was tempted by the beauties and glories of a fine Spring morning to extend my daily walk too far—I became fatigued, and sat down to rest. My seat was a large rock against the fence. Just in front of me, not twenty feet distant, was a magnificent elm tree, venerable in its appearance, and full of foliage. It was the only tree near. I listened to the rustling of the leaves, all else was still as the grave.—There seemed to be a secret magnetism produced by the music of the wind and leaf which penetrated my soul, and wrought a spell for my senses. The rustling became regular, melodious, and soothing; still I listened—it seemed to sweep through every note of the scale—from the rich melody of the harp, to the plaintive sweetness of the dove—from the pure thrilling of the nightingale, to the bold language of *man*. Yes, there was *language* in the rustling of the leaves—the tree did talk, and thus it mused:

"Can it be! Can it be! It is just two hundred years since I first saw that sun; he was bright and beautiful then as now—all else how changed. It is just two hundred years since I first saw the glorious firmament above me; it is, too, the same, unchangeable, eternal. Every thing else has changed. The dews of two hundred Summers have settled upon me; the tints of two hundred Autumns have painted me; the frosts of two hundred Winters have chained me; and the meltings of two hundred Springs have released me. My history is peculiar. I have watched for centuries the vicissitudes of men—the building up and the crumbling down of man's works, and the growth and decay of Nature. I remember when only the wild beast and the red man roamed in solitude and the forest around me. The wild beast has gone. The red man has been robbed and murdered; the forest has dwindled away before the resistless energy of civilization, and solitude has been succeeded by the noisy hum of business, and I am left alone. I have seen genera-

tion after generation rise up and pass away "like the baseless fabric of a vision." The Indian stripling has swung among my branches; the early settler has often gathered his family around my trunk; the wandering traveller has sought repose and shelter in my shade; the robin has nestled among my boughs; armies have been marshalled around me; the patriot has found in me a hiding place in war, and the statesman a quiet retreat in peace; the lover has breathed his warm vows in my ear; the poet has sung to me his ditty; the bright-eyed girls have danced their May-day sports around me, and the romping boys have deafened me with their noisy fun; the worm has feasted in my flesh, and man has been healed by my bark;—but the Indian boy, the robin, the poet, the lover, the army, the worm, and the man, have all gone—one by one, they have all gone. One after another they have been succeeded by their kind—they, too, have gone; generation after generation has come and gone, and I am left alone. I have seen the Demon War striding over the land in all his terror; I have seen the Pestilence "stalking abroad" in her awful might, laying men in the dust—but I have seen others rise up in their places, and follow them to the tomb. Yon lovely mansion is reared upon the ruins of a little church that I saw a handful of men build one hundred years ago. I knew that rich man's father, he was an industrious wood-chopper. I knew that good clergyman's mother—she prayed often for him, under my shelter, when all was still around. I knew that ragged lad's ancestors to the third and fourth generation, they were drunkards, and debauchees and evil livers; their sins have been visited upon his head.

More than seventy thousand times have I seen night succeed to day, and day drive away night. More than seventy millions of leaves and buds have I put forth and shaken to the ground. Not one iota of earth lies near me now that did when first I saw the ground. I have seen a human bone laid on every inch of soil as far as my eye can reach, and when the last trump shall sound, every clod around me shall be instinct with life.

I have heard the simple tradition of the Indian about "the Great Spirit" and "the Good Home;" I have seen the holy Missionary bring the better tidings of the Bible; I have seen these good tidings perverted and corrupted in these evil times.

I have watched the rule of Fashion, and seen the misery and slavery of her subjects—a sad and terrible tyranny more implacable and capricious than Nero's. I have seen all this, and more. and gathered from it this one truth: *the spirit of nature is change*—no succeeding men, or things, or generations, are like those which preceded them. I have seen

a dozen different ages—the spirit of them all different. I have seen the age of Toil; I have seen the age of Industry, of Plunder, of Honesty, of Piety, of Enterprise, of Indolence, of Learning. I like this age least of all—it is the age of Insincerity. Nothing is true—nothing is what seems; no one does as he says—no one says what he means. I am tired of life; it has no charms now. I am tired of life—*I am tired of life—I am tired of life.*" * * * * *

The old tree in his eloquence became too loud—*I awoke*, and found that the rising breeze had increased the rustling of the leaves so much as to disturb my slumbers. It appears that I had fallen asleep. The languid atmosphere of Spring, and the music of the stirring leaves, are (next to a long Greek lesson in a hot afternoon) the best soporifics I know of.

About a year from the time of this "musing of the old tree," I chanced to stroll that way—*the tree was gone*—the woodman had not spared it; a stump only remained. I visited the spot again—the worm was rioting in the rottenness of that old tree, and time and decay were fast wasting it away. Q. C. X.

EASY METHOD OF COLLECTING INSECTS.

Over a planed board stretch a piece of strong white paper, which is glued only at the edges, so that small pieces may be conveniently cut off the board. Daub the paper over with a *sticky* varnish which does not dry too fast, and then place it in an orchard or other favorable location. If on the next day you find insects on it (which are of course fast,) you can just cut out as much of the paper as the insect occupies, and transfer it to your cabinet. In this way many rare and even new species may be captured, and that too without any mutilation.

This plan would of course, not suit for very large beetles or butterflies I have heard of a method persued by a Lepidopterologist which is at least curious. If he had a living female butterfly of a rare species, he carried it to the woods or under the shade of a tree, and fixed it to the tree with a pin, not through the body, but through both wings, and withdrew a short distance. Usually it was not long before the male of the same species would come flying along, flutter about for a while and then discharge his destined duty. He would then take the impregnated female home, carefully preserve her eggs, and rear a numerous family of the species.

The great distance in which the male butterfly can perceive (not see) the female in certain seasons, is one of the most remarkable facts connected with the natural history of these interesting animals.

THE NATURALISTS' CLUB. NO. I.

On the 17th of August last, just as the sun was preparing to say good evening to a glorious day, a boat might have been seen shooting out of a cove of the beautiful Susquehanna, not far from Columbia, freighted with live stock of the genus *homo*. There were five *specimens*, who had spent the day in learned converse on the wonders of creation; they had examined the length of a flea's toe with microscopic aid—they had leafed over ponderous tomes to determine differences where was no distinction—they had accurately measured the dimensions of an animalcule that was invisible to the naked eye—

> "Of birds and flowers they talked,
> Plants, insects, trees and many creeping things."

They now sought relaxation from severer labors by an aquatic excursion, and their little bark "walked o'er the water like a thing of life," for two sturdy arms plied the yielding oars. Entomophilos sat in the prow—he was the Nestor of the crew; Encyclopedianus occupied the stern: he was owner and commander; Ornithophilos, with gun in hand, watched the tall heron as he flew to his roost;—Paganus (not a Pagan, but a right good christian and a *villager*,) was leaning over to fish up beetles floating by; and Urbanus, "a dweller in cities," rowed the fir-built boat. "Ornith.," cried Ento., "look above you." In less time than this is written, there was a report of his gun, and a large blue heron was struggling on the surface of the water. "A good shot!" was echoed all around.

"Do you ever miss on the wing?" asked Encyc.

"Not often when I'm in good nerve."

"Did you ever try yourself at an object thrown up by another?"

"Yes, and won a good supper for myself and six others from a country tavern-keeper. We were out gunning one day, and stopped at a house for refreshment. The publican offered to bet that I could not hit a quarter six times out of nine. I took him up. I loaded both barrels—the quarter was thrown. I banged away and struck it twice before it fell. I did the same thing twice; the fifth shot I knocked it so far off that I was obliged to run after it to hit it again before it fell, but the publican cried out, "I give it up—you need'nt try any more—I've lost.—Now what will you have?" said he.

"Coffee and chicken fixens for six," I replied.

"You shall have them, and never did I pay a lost bet more cheerfully," was his answer.

"That was *fowl* shooting," dryly remarked Paganus.

At that moment, Pagan fished up a fine beetle floating by on a chip, and impaled it with a villainous long pin, while the poor animal struggled for liberty.

Urban with a grave countenance said—"Hem! listen to Shakspeare:

——— "The poor beetle that we tread upon
In corporal sufferance feels a pang as great
As when a giant dies." "

Encyc. took him up. "Do you quote Shakspeare to prove the sensibility of insects? What authority is he on that subject, even if you interpret him in that sense? But I believe that these words have been entirely wrested from their original purpose."

"Gentlemen! listen to a lecture on Shakspeare. Urban rest on your oars," ordered old Nestor.

"As I was saying"—resumed Encyc., after bowing his acknowledgments to Ento. for the command of silence—"I believe the bard has been misunderstood; what was his purpose?—it was to show how little a man feels in dying; that the sense of death is most in apprehension, not in the act, and that even a beetle, which feels so little, feels as much as a giant does. The less, therefore, the beetle is supposed to feel, the more force we give to the sentiment of Shakspeare."

"Admirable commentary! I shall feel less compunction hereafter," replied Pagan.

"But still I cannot help thinking it cruel to impale insects," observed Ornith.

"You, Ornith., to speak thus who every day kill warm-blooded and vertebrate animals which we know have sensibility; look at that heron, he's kicking yet," remarked Ento.

Ornith. was *mum* and whistled "Oh, no! I'll never mention it."

The rest roared, but our faces had not assumed their wonted gravity before *bang! bang!* went both barrels of his gun, and two king-fishers fell wounded into the water, screaming most dolorously.

"Yes, yes," continued Ento. archly, "it *is* cruel to kill insects, when birds seem to feel *so little!*" Ornith. was silent, but he gave the rest a sly wink.

"There, now, fast on a rock!" cried Pagan.

It was true; the boat had struck with terrible violence, (for Urban was rowing.) "*Infames scopulos!*" muttered the latter, who had lately been reading Horace's Odes.

"How shall we get off?" was the general cry.

"*Nil mortalibus arduum;*" said Urban, and was in the river up to his waist in a moment.

"Can you quote Horace now?" asked Ornith.

"Yes," was his reply, "and will translate it too. *Gens humana*, means, Mr. Urban: *ruit per*, jumps right into, *vetitum nefas*, the waters of the river."

"Yes," said Ento., who deals in the healing art, "you may add a few more lines from the same ode; *macies*, fever, *et nova cohors febrium*, and ague, *incubuit*, will stick in, *terris*, your bones."

"*Herculeus labor*," groaned Urban, as he tried in vain to push off the boat."

In a few moments they were all in the water except Ento., and with a yo heave oh! she was got off.

"Now," said Urban—

"——— impiae
Non tangenda rates transiliunt vada."

that is, at these *rates* we need no longer *wade*."

The party now landed on the York county shore, and had not proceeded far in their stroll, before a snake's nest full of eggs was discovered, and then was discussed the whole subject of serpentine ovation.

Several of the party stripped off their wet clothes and bathed in the placid stream; it was refreshing, though the others did pelt them with the half hatched snake's eggs aforesaid.

On the homeward voyage, Encyc. took the oars and Urban intended to entertain the company with the beautiful Canadian boat song:

"Row, brother, row, the clock runs fast,
The supper is near, and the day-light's past."

He was interrupted in the midst of a magnificent trill by Ornith. who remarked, "Yes, I'm very hungry." This broke the charm of the sentimental piece, and he ceased.

The supper table was finally reached, and fearful was the devastation of the good things provided. The conversation was continued until it was late enough to be called early, when Ento. said, "Blessed is the man who first invented sleep, for it covers one all over like a cloak, as Sancho Panza saith."

Urban yawned—

"Oh for a lodge in some vast bed,
Some boundless continuity of sheet and blanket."

When each man slinked off to rest to dream of the aquatic excursion of the Naturalists' Club.

METEOROLOGY.

CLEAR AND COLD NIGHTS AT TIME OF FULL MOON.

Every one must have noticed that the atmosphere is less liable to be obscured with clouds, and is more transparent during the nights about the time of full moon than at other times. It is further a matter of common observation that at that period it is in general calm and cold. This has no doubt led to the remark that the moon's ray is cold, and in this distinguished from that of the sun.

These facts belong to the common stock of knowledge possessed by the community at large. Even the slightest observer knows that the late frosts of Spring and the early of Autumn take place about the time of new and full moon, but especially the latter, that the full moons of Summer are accompanied with cool, serene nights, and that those of Winter are in general marked by hard freezing weather. How much surprise must not then the community have felt, when, during the early part of last Summer, it was stated in numbers of the newspapers of the country, upon the authority of Dr. Lardner, that *the moon had no influence upon the weather*. The statement was no doubt designed to have reference to the prevailing opinion that it exerted a considerable influence in the production of rain. But the atmospheric changes from cloud to clear, from rain to dry weather, are all bound up together in one physical series, so that if the moon be concerned in the production of the one class it is also concerned in the production of the other.

Facts so common, interesting and important as those just stated, could not have been observed and known without having frequently given rise to the question, "What is their cause, or how may they be accounted for?"

An explanation, not without a considerable degree of plausibility, was offered, at a recent meeting of "the British Association for the promotion of Science," by Sir J. F. W. Herschell. Upon the authority of the calculations of a French philosopher whose name cannot just now be recalled, he stated that the temperature of the moon's surface resulting from its long exposure of two weeks during each lunation to the rays of the sun rose to a point not less than that of boiling water. According to his opinion, that portion directly presented to us must attain its maximum temperature at the time of full moon, and freely radiate its heat to the earth. That heat being of the nature of non-luminous caloric, which is more abundantly absorbed in passing through certain media than luminous caloric is arrested by the vapor in the air in its passage towards the earth, raising its temperature and rendering the solution more perfect. In this manner, then, we are taught to believe, is

already existing cloud dissolved, and the formation of other prevented.

If we regard the preceding explanation as correct, the greater degree of cold generally prevailing at that time must be referred to the effect of the free radiation of the heat of the earth through an almost perfectly transparent sky. When the sky is obscured by clouds or vapors the heat radiated from the earth is arrested by them and returned so that its surface receives nearly as much as it rejects, and the temperature remains almost stationary. On the contrary, when the sky is clear, the radiant heat passes off into the depths of space and cold is produced.

But whilst it is admitted that this is a very ingenious and plausible explanation of the phenomena in question, it seems like attributing entirely too much to lunar radiation. A temperature like that of boiling water, or even one far greater, must, according to the law of all emanations, which is, that they diminish as the squares of the distance from the source increase, yield a quantity of heat at the distance of the earth's atmosphere, far too small to be appreciable, and consequently cannot be adequate to the production of so striking a meterological phenomenon.

As the preceding explanation is not perfectly satisfactory, the following, which is however also not without its difficulties, is respectfully suggested. With how much favor it may meet, it is at present difficult to tell.

The sun and moon both raise atmospheric tides, following them in their diurnal course as do those of the ocean. When these bodies are in conjunction, that is, in the same line with the earth, the tides they raise in the ocean are the highest possible. The same may be inferred to be the case in the atmosphere. At the time of full moon therefore, the greatest possible atmospheric tide is produced, there being then a determination of the colder air of higher latitudes to accumulate under the moon's track. Now it is an established law of meteorology that such air having its temperature raised by coming into lower latitudes will have its solvent power increased, and not only hold its own vapor in perfect solution, but also dissolve that which it may meet in its progress, and thus a clear sky would be produced. It is not necessary to suppose that there should be such a rapid approach of the air from higher latitudes as to produce considerable winds, but only a greater determination than at other times. On the contrary, whenever there is an accumulation above the mean, however small the excess may be, it is accompanied with a perfect calm.

The greater amount of cold then prevailing may be attributable in part to the cause assigned under the theory above named, and in part to the afflux of air of lower temperature from higher latitudes.

A VISIT TO A GREAT PICTURE.

It cannot fail to be a source of regret to those who happen to possess "a taste" for the Fine Arts, to observe, throughout our land, the low degree of genuine appreciation put upon the great works which have fallen to us as heirlooms from Genius. Some, indeed, might deem it a question, whether the period is to be longed for when our Da Vincis, our Correggios, our Raphaels, can be fed by Americans, and their productions, as subjects of thought and conversation, take the place of hot-bed speculations, partizan feeling, and territorial acquisitions, or, as sacred Penates, fill not only the niches of our public buildings, but find their way to the homes of our private citizens. Some might mourn for the patriotism of him, whose kindling eye lights up with enthusiasm when the Leos and Medicis of the world are spoken of. Others, more charitable, kindly feel a pity, which however, never fails of being accompanied with a self-congratulation, that they, at least, are sane on that subject.

Still, the privilege of thinking differently will not be denied; and we, whether fortunately or unfortunately, we will not now say, happen to have been born, if we have been rightly informed, with a humble share of this enthusiasm, so much descried, so much pitied, so little met and sympathized with. In consequence it has been a source of no little gratification to find among our nursery traditions, some strange accounts of the marvellous exactness with which our infant hand traced the shadow of the nurse's nose, projected in giant proportions upon the wall. Not that we would make any vain inferences, for it is rather amazing that so little should have been realized from a promise so hopeful; but, that our words may be clothed with some measure of authority, for Nature has drawn across the entrance to this Hall of her Temple a bar that none but the *adepti* may ever pass.

These remarks have arisen from the remembrance of an incident.—As my years verged towards manhood, I heard much about the productions of the Great Masters, but never, except in fancy, had been granted to me that which I so much coveted but half dreaded—an opportunity of mingling with the throng of worshippers around the shrine of Genius. Imagine, then, my delight, when, at length, the long wished-for boon was realized! Imagine the throbbing of expectation, when, a little before the appointed time, I stood before the pile of common brick and mortar, which actually held "a Great Picture!" Imagine, if you can, my amazement, when upon being ushered in, no sight burst upon my eye, to make me sink to the earth in deep awe, or gape with open-mouthed wonder; none to

———"harrow up my soul; freeze my young blood;
Make my two eyes, like stars, start from their spheres;
My knotted and combined locks to part,
And each particular hair to stand on end,
Like quills upon the fretful porcupine."

nothing of this; and here, where I thought I should meet hundreds as eager as myself, I found that if worship must be done, I might perform my devotions almost in perfect privacy; for about a dozen persons and six hundred empty seats made up the audience. Alas! I was to learn more than one thing before I left that room; I had a horror of being noticed, so I quietly took a retired seat and fixed my eyes upon the painting. Before long my dreamy thoughts began to assume a tangible shape, and I started to find, tinging every hue of them, a heavy shade of disappointment. This was hard to believe; put it came on, deeper and deeper, until doubting was no longer possible. I felt a downright disappointment. My head sunk, the blood tingled to my temples; for I knew that I *ought* to admire. But the flimsy figments were vanishing; I was just awaking from false impressions and false feeling; and, as those who have passed through the same process well know, only preparing to appreciate. I now concluded that after all "the gift" was denied me; and so lifted up my eyes and looked with a dogged indifference—so imperceptibly, that I perceived not the lapse of time; a strange feeling of interest began to steal over me, and as it increased—slowly—slowly—the audience, the hall and its furniture, and eventually the canvass melted away, and I felt myself mysteriously connected with the figures that had thus magic-like started into being.

There is face there, a mild and gentle face, that speaks eloquently. The head is slightly inclined, and the eyes shaded by long drooping lashes, are directed to an object of suffering in front. Parting from the noble brow, the dark hair clusters upon the shoulders in heavy ringlets. The lips, from which words of Life have dropped, are slightly parted, as if the accents of pity and blessing still lingered upon them. And there, within that fair oval, methinks I read of the "fulness of grace and truth," of ineffable love, and dim, sad traces of "the man of sorrows, acquainted with grief." Other heads are grouped around; and with what interest does the eye scan the features of those, whose lips once tremblingly breathed "Is it I?" The tender, affectionate, almost woman-like expression of one—the bold and fearless indignation of another—the sneaking, sniveling, suspicious look of another—how well portrayed! But look around; want, decrepitude, agony and madness have each their representative. The full vigor of life, and the sunken

livid features that merely tell of its existence, yet all lit up with a common feeling of interest, with trembling hope, mute wonder, and swelling gratitude. See that wife! worn to a shadow by constant watching, she has accompanied her sick husband hither, and now kneels by his side, while, with an expression of imploring but believing hope, she turns her deep-blue eyes up to Him, whose gentle word of power sends the life-blood thrilling through the death-grasped limbs. Ay, that is a face! That is the "love stronger than death!" Here is Infancy passing through the "one brief pang of unremembered sorrow." But the mother's love is strong. She would have it called back from the threshold of the spirit-world to gladden her heart again with its innocent prattle, to be her heart's joy and comfort in declining years; and, when death must come, take her first, or lay them both in the same grave. How chilling now, to turn from these yearnings of the heart, to that head, ensconced in badges of office and sacred dignity! Along its strongly marked lineaments there creeps a savage, sullen scowl of malignant envy, and beneath those shaggy brows we know the small grey eyes are twinkling with a jealousy that gnaws. Bah! the ugly wretch. Mark now the countenance of that blind beggar. The bright sun of heaven has well marked his bronzed features; but never, never has its light pierced through those vacant orbs, to call forth extasies that now, to him, are all unmeaning. His soul yearns after some want, undefined perhaps, but the gratification of which is to let in upon him an inconceivable blessing. He knows, too, that this gratification is near; and emotions of no ordinary character are coursing tumultuously through his breast.

Infancy, youth, manhood and old age; health and disease; joy and happiness; stolid indifference and intense emotion; stern indignation and mournful sorrow; fierce anger and heavenly peace; utter weakness and boundless power—all here—how much to admire!

BURIN.

KIDDER'S BRAZIL,

Embracing Historical and Geographical Notices of the Empire and its several Provinces, By DANIEL P. KIDDER. In two volumes.

We have read these interesting volumes with great pleasure, and cordially recommend them as worthy the perusal of all who desire an acquaintance with this important district of the globe, which comprises nearly the half of all South America, and covers an area equal to six-sevenths of Europe, being larger than the United States with all its ter-

ritories. "Embracing the whole latitude of the Southern torrid and ten degrees of the Southern temperate zone, and stretching its longitude from Cape St. Augustine, the easternmost point of the Continent across the mountains of its own interior to the very feet of the Andes, its soil and its climate offer an asylum to almost every valuable plant." The author describes the scenery as magnificent, and the climate salubrious and free from all the earthquakes to which other portions of South America are subject. The physical attractions of Brazil have led to most of the researches with which the public have been made acquainted, yet prior to the publication of these volumes, comparatively little was known relative to this vast empire. Although the country was visited by Prince Maximilian, Spix, Martius, Langsdorff and others, whose scientific investigations have been given to the world, still our sources of information have been meagre and limited. This is the first American work on Brazil that has been issued from the press. Even the English volumes on this subject are of recent publication; nor is there any one, the writer of which possessed opportunities for extensive observations. Southey's quartos are only to be found in large libraries and perhaps seldom or never read, and the continuation by Armitage is still less familiar to the community.

Mr. Kidder's object in visiting Brazil, was to introduce the gospel to the natives, and the success of his mission is most encouraging. He is the only Protestant clergyman that ever proclaimed the glad tidings of redemption on the banks of the Amazon; and yet he assures us there is no country which presents so few obstacles to the introduction of the christian religion—offers so many facilities for evangelical labor; and is so well calculated to awake the zeal of the American church.

A few extracts will give our readers some idea of the style of the author:—

Our author furnishes an interesting account of the manufacture of the Mandioc flour *(farinha de mandioca.)* This vegetable being the principal farinaceous production of Brazil, is worthy of special notice. Its peculiarity is the union of a deadly poison with highly nutritious qualities. It is indigenous to Brazil and was known to the Indians long before the discovery of the country. Southey remarks: "If Ceres deserves a place in the mythology of Greece, far more might the deification of that person have been expected who instructed his fellows in the use of the Mandioc." It seems strange how savages should have discovered that from the root a wholesome food might be prepared.—Their mode of preparing it was by scraping it to a fine pulp with oyster shells or with an instrument made of small sharp stones set in a

piece of bark, so as to form a rude rasp. The pulp was then rubbed or ground with a stone, the juice carefully expressed, and the last remaining moisture evaporated by the fire. The Portuguese soon invented mills and presses for this purpose. They usually pressed in cellars and places where it was least likely to occasion accidental harm. In these places it is said that a white insect was found generated by this deadly juice, and itself not less deadly, with which the native women sometimes poisoned their husbands and slaves their masters, by putting it in their food. A poultice of Mandioc was considered excellent for imposthumes. It is also administered for worms. For some poisons, and for the bite of certain snakes, it was considered a sovereign antidote. The simple juice was used for cleaning iron. The leaves of the plant are eaten, and the juice may be rendered innocent by boiling, and be fermented into vinegar inspissated till it becomes sweet enough to serve for honey. Mandioca is difficult of cultivation—the more common species taking about fifteen months to ripen. The roots when dry are of a fibrous texture, corresponding in appearance to those of trees. The present process of preparation is to boil the roots, then remove the rind, after which the pieces are held by the hand in contact with a circular grater turned by water power. The pulverized material is then placed in sacks, several of which thus filled are constantly subject to the action of a screw-press for the expulsion of the poisonous liquid. The masses thus solidified by pressure are beaten fine in mortars. The substance is then transferred to open ovens or concave plates, heated beneath, where it is constantly and rapidly stirred until quite dry. Its appearance when well prepared is very white and beautiful, although its particles are rather coarse. It is found upon every Brazilian table, and forms a great variety of healthy and palatable dishes. The fine substance deposited by the juice standing a short time, constitutes *tapioca* which is now a valuable export from Brazil.

The author refers to the *Matte* which is extensively used in South America as a favorite beverage. This is the leaf of the *Cassine Gongonha*, commonly called the herb of Paraguay. The infusion is prepared in a bowl. A small quantity of the leaf, mixed with sugar, is suffered to stand a short time in cold water. Boiling water is then added, and it is at once ready for use. A peculiar method of drinking has grown out of the circumstance, that the particles of leaf still swim in the tea. It is sipped through a tube with a fine globular strainer at the end immersed in the fluid. For ordinary and plebeian use, a reed with a wicker bulb suffices. Among the wealthy the *bombilha* must be silver. Great virtues are ascribed to this tea, and our author remarks that to his

taste the flavor was quite as agreeable as that of the Chinese tea. It is said, especially if taken cold, to relieve hunger and thirst. In Chili and Peru the people believe they could not exist without it and pray persons take it every hour of the day, debauching with it as the Turks do with opium. Indians who have been laboring all day at the oar, feel immediately refreshed by a cup of the herb mixed simply with river water. The Jesuits attempted to cultivate this shrub but only partially succeeded. It grows spontaneously in the regions of Coritiba and Paranagua and flourishes best when suffered to propagate itself.

The following description of the Cocoa will not, we suppose, be denied of interest to the readers of the Journal. It is the staple vegetable, and although many of the uses to which it may be applied are unknown or unpractised here, yet it literally furnishes the people with meat, drink, fuel, houses and commerce. Besides the sale of the raw nut, the pulp is converted into oil, the shell into dippers, and the fibrous husk into cordage; while the water is valuable as a beverage. At the same time the leaf gives materials for the construction of an entire habitation. It is wrought into baskets, it makes fences, and when dried may be used for writing, while its ashes yield potash. The terminal bud is a delicate article of food; the juice of the stem and flower contains sugar and may be fermented into wine or distilled into spirits; and finally the case of the trunk or stem is converted into drums or used in the construction of buildings, while the lower extremity is so hard as to take a beautiful polish, after which it resembles agate. Persons mounting the trees to pluck the fruit, carry a *fouce* or hedging bill with a short handle to cut the stems. It is twisted into the girdle of the bearer, who if expert, places simply his hand and feet against the side of the tree and *walks up*, if not with the agility of a monkey, certainly with incomparable self-composure; this is done on the tallest and straightest trees.

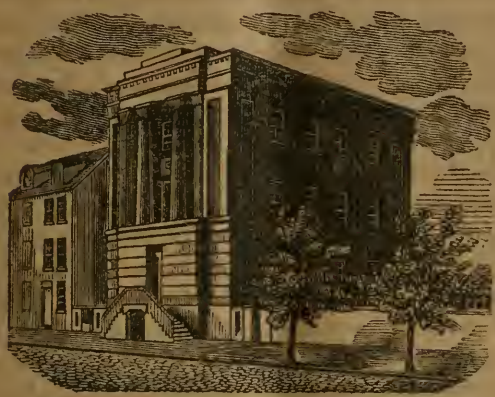
But our limits will not allow us to follow Mr. K. any further, and we must refer our readers to the book itself, assuring them that it will repay the time spent in its perusal.

PENNSYLVANIA COLLEGE.

The Winter Session of Pennsylvania College commenced on the 23d of October. The accession of new students in the first half of the term has been unusually large, and there are now about one hundred and fifty students in attendance in all the departments of the Institution, which has never been in a more prosperous condition. The Medical department in Philadelphia has also opened with a large accession of new students.

PENNSYLVANIA MEDICAL COLLEGE,

Filbert above Eleventh street, Philadelphia, Pa.



MEDICAL FACULTY AT PHILADELPHIA.

WM. DARRACH, M. D.—*Prof. of Theory and ractice of Medicine.*
JOHN WILTBANK, M. D.—*Prof. of Obstetrics and Diseases of woman and children*
WM. R. GRANT, M. D.—*Prof. of Anatomy and Physiology.*
H. S. PATTERSON, M. D.—*Prof. of Materia Medica.*
D. GILBERT, M. D.—*Prof. of Principles and Practice of Surgery.*
W. L. ATLEE, M. D.—*Prof. of Medical Chemistry.*

GETTYSBURG FEMALE SEMINARY.

At this Institution is taught all that is considered essential to a finished education, including Instrumental and Vocal Music, Drawing, Painting, Languages, Ornamental Needle Work, &c.

The boarding department will at the next session be removed to the pleasantly located residence of the Principal, known as Oakridge; the the pupils will then be members of his family.

Several gentlemen of distinguished literary and scientific attainments will deliver frequent addresses throughout the course, on subjects of interest and importance.

The institution is well supplied with experienced and successful teachers, and with a valuable and increasing collection of Philosophical and Chemical apparatus, Minerals, Shells, Zoological specimens, &c.

H. HAUPT, *Principal.*

Pennsylvania College, Gettysburg, Pa.

PENNSYLVANIA COLLEGE has now been chartered about fourteen years. During this time its progress has been such as to gratify the most sanguine expectations of its friends. The course of studies is as extensive and substantial as that of any Institution in the Country. The *Preparatory Department* provides for instruction in all the branches of a thorough English, business education, in addition to the elements of the Mathematics and Classical Literature. The *College Course* is arranged in the four classes usual in the Institutions of this country.

The government of the students is as energetic as their circumstances seem to require. They attend at least two recitations a day, Church and Bible Class on the Sabbath, and are visited in their rooms so frequently as to preclude the danger of any great irregularities. It is believed no Institution in the United States has more exemplary young men in connexion with it. They are all required to lodge in the College Edifice, special cases excepted.

The annual expenses are—for board, tuition and room-rent, during the winter session, $61 87½: for the summer session, $41 87½. Washing, $10 00; and Wood, $3 00. Total expense, $116 75. Boarding can be obtained in town at $1 25 per week.

There are two vacations in the year, commencing on the third Thursdays of April and September, each of five weeks continuance.

Acknowledgements of Donations to the Cabinet of the Linnæan Association of Pennsylvania College.

November, 1845. From *Mrs. Geo. T. Stuckert*, a Bible of 1648, once the property of Lord Dungan, Earl of Limerick and Dunganan.

2. A Certificate of the society of the Cincinnati, containing the autograph of George Washington, Pres't.
3. From *Mr. G. T. Stuckert*, a rare silver coin of 1605.
4. From *Mrs. John Taylor*, an image of one of the Lazaroni of Italy, formed from the lava of Mount Vesuvius.
5. From *Miss Harriet Barnitz*, a fine specimen of branch coral.
6. From *Rev. S. Oswald*, a preserved specimen of the Lamprey.
7. " " " a box of foreign Insects.
8. From *Miss M. E. Livingston*, an Indian pincushion.
9. From *Miss E. Eichelberger*, the Lord's Prayer in fancy penmanship.
10. From *James Renshaw, Esq.*, a copy of the first published proceedings of Congress, 1774.
11. From *Mr. G. A. Shriver*, a fine specimen of Limestone with interposed strata of clay slate.
12. From *Mr. M. M. Yeakle*, one reptile in spirits and two framed prints.
13. From *T. A. Fleming, M. D.*, thorns of the Honey Locust, specimen of the Coffee-nut, and remains from Pittsburg fire.
14. From *Mr. George Martz*, one rare coin.
15. From *Mr. J. Lower*, 36 copies of Medals, &c., from the U. States Mint.
16. From *Rev. A. Height*, a reptile in spirits.
17. From *Mr. C. A. Brougher*, a specimen from Jefferson's Rock, Harpers Ferry, Va.
18. From *D. G. Barnitz, Esq.*, rare copies of papers from 1769, to 1819.
19. From *Rev. Prof. Hay*, the skin of a black squirrel, *(Sciurus niger.)*
20. From *Matthew Miller*, specimens of iron ore, and nest of Baltinore oriole, (*Icterus Baltimore.*)
21. From *Mr. Jacob Byer*, specimen of lead ore.
22. From *Mr. Samuel Mitchell*, Ill., 20 specimens of coins.
23. From *Miss R. Cooper*, one coin stamped with the Lord's Prayer.
24. From *Augustus C. Wedekind*, an English coin.
25. From *W. A. Renshaw*, a rare French coin.

VOLUME II.] [NUMBER 2.

THE

LITERARY RECORD AND JOURNAL

Of the Linnaean Association of Pennsylvania College.

DECEMBER, 1845.

CONDUCTED

By a Committee of the Association.

CONTENTS.

1½ sheet, periodical—Postage, 2½ cents, to any distance within the Union.

NEINSTEDT, PRINTER, GETTYSBURG.

THE LITERARY

RECORD AND JOURNAL

OF THE LINNÆAN ASSOCIATION OF PENNSYLVANIA COLLEGE.

Vol. II. DECEMBER, 1845. No. 2.

AN INTRODUCTION
TO THE NATURAL HISTORY OF LEPIDOPTEROUS INSECTS.

Abridged from the French of Boisduval.

Naturalists designate by the name of *Lepidoptera** all those insects commonly called *Butterflies*, and which present the following characters :

Four wings covered upon both surfaces with small colored scales like a farinaceous dust or fine bran. A tube or tongue, more or less long, spirally rolled together, called the *spiritrompe*, situated between two cylindrical or conical palpi, more or less elevated, formed with three articulations, and inserted upon a fixed lip. Two antennae of a variable form and always composed of a great number of articulations. A part well developed, called the *pterygoda*,† or epaulette, situated at the base of the upper wings, prolonged posteriorly. An abdomen destitute of an ovipositor and of a sting. There are never more than two kinds of individuals, males and females.

All these insects, without an exception, come from larvae called *caterpillars*, which are distinguished from other larvae by never having fewer than ten nor more than sixteen feet. These caterpillars having obtained their full growth, change into *chrysalids*, from which, after a longer or shorter period, come forth the perfect insects, which bear a perfect resemblance to those to which they owe their existence.

It is our present intention to give a brief sketch of these insects, and to enter into some details in regard to their external organization, under each of their three forms.

The Imago, or perfect state.

As in all other insects, the body of Lepidoptera is composed of the head, the thorax, and the abdomen. The second of these parts, with

* λεπις, λεπιδος = scale, and πτερα = wings, whence the word Lepidoptera has been formed to signify scaly wings.

† Called *patagia*, or tippets, by K. and S.—Tr.

very few exceptions, has four wings and six feet: as it performs, in this connexion, a very important part in the organization, we examine it first.

The THORAX, or chest, is formed of three segments perfectly united, of which the anterior one, quite short and in the form of a collar, is the *prothorax;* the other two, or the *mesothorax*, and the *metathorax*, are always fastened together, and seem to form but one whole. The latter is terminated above by a small triangular piece, the vertex of which is turned towards the head, and which is the *scutellum*. The upper part of the thorax is called the *back*, and the lower the *breast*. The former is almost always covered by the pterygoda, which, according as they are more or less developed, alter the form of the thorax more or less.

This form, although varying considerably according to the species, is in general oval. According to the size, proportionate differences are observed in the thorax.

The HEAD is generally rounded, compressed in front, rather broader than it is long, always a little narrower than the thorax. Its anterior part, or *front*, is called by most etymologists, though improperly, the *hood* (chaperon). The head is very salient in the diurnals, and ornamented with fine hair. That of the Heterocerata is not so large, less salient, ornamented with scaly hairs, and sometimes entirely drawn back beneath the thorax, as in the *Adelocephala*. In some species it is dotted like the prothorax. The important organs of which that part is the seat are the *eyes*, the *stemmata*, the *antennae*, the *palpi*, and the *spiritrompe*.

The eyes, composed of innumerable little facets, are large, edged with hairs, which probably fulfil the functions of eyelashes, and present no peculiarity except in regard to the color which frequently changes during life: in some species, as the Eurybia, they are of a brilliant green; brown as in the *Sphinx* and most of the Nocturna: reddish in most of the *Satyridae*, etc.

The stemmata, or *eyelets*, are situated upon the vertex, and do not occur in all species: they are concealed under the scales, and are not visible until the upper part of the head has been denuded. They are to be seen, though not without some difficulty, in the *Zygaenae*, the *Procrides*, the *Sesiae* and most of the Heterocerata.

The antennae, situated near the inner edge of each eye, are ordinarily shorter than the trunk, and composed of a great number of articulations. Their form is very variable: in all the Diurna, which for that reason have been named *Rhopalocerata*,* they are filiform until near the extremity, and terminated by a knob or club more or less elongated.

* ῥοπαλον = club: κερας = horn, antenna; that is, antennae terminated with a club.

This also varies according to the species: sometimes it increases gradually over the anterior third of the antennae; at others it is scarcely perceptible; sometimes it is formed by a sudden outjutting, either conical and truncated, or laterally compressed and flattened; sometimes hollowed out spoon-shape, and sometimes terminated by a little point bent back like a hook. In all the other Lepidoptera, which in opposition to the former, have received the name of *Heterocerata*,* the antennae are no longer found club-shaped, except in the tribe of the Castniae, which in this respect slightly recall the preceding. They are either prismatic, as in most of the Sphingidae; or linear as in the Sesiae: like a ram's horn, as in the *Zygaenae;* or simply bent outwardly like a bow, as in the Aegoceridae. In a great variety of genera they are filiform and attenuated at their extremity; in others, mostly those which form a part of the *Bombyx* of the older authors, they are pectinated, that is, upon each side they present a row of small teeth which have been compared to those of a comb. When these teeth are long, and resemble the beard of a feather, the attennae have been called plumaceous or feathered; those of many Geometrae give an example of this arrangement.

The palpi are four in number, two maxillary, and two labial: but, except in some races of Heterocerata, the former are always very diminutive, and visible only by the aid of a very strong magnifier; they have most generally the form of a small tubercle, and are situated at the base of the spiritrompe. The second, on the contrary, are generally very distinct and erect, cylindrical or conical, covered with scales or with very fine hair, formed by three articulations, of which the last, generally very small, and almost obliterated in most of the Rhopalocerata, is sometimes very long in the Heterocerata, forming there an acicular point more or less prominent. The palpi are generally contiguous or connivent; but at other times they are considerably separated, with some space between them. Some genera have them very scaly, others simply bristled with rayed hairs, or the hair more or less soft. Generally they are erect and gathered towards the front; but sometimes they are quite straight and parallel to the axis of the body, as in the *Libytheae.* Those of the Emesis, another genus of Rhopalocerata, are small and so short as scarcely to go beyond the base of the horn, so that at the first view they would scarcely appear to exist in that genus.

The spiritrompe is composed of two threads more or less long, horny, concave upon their internal surfaces, with their edges fitting into each other: when a transverse section is made we see that it is composed of three narrow canals, of which the intermediate one, according

* ετεροιος = variable; κερας = horn; antennae of various forms.

to some authors, is the only one that serves for the transmission of nutritive juices. When inactive it is always spirally rolled up between the palpi. All the Rhopalocerata are provided with a well developed spiritrompe. In the Heterocerata its length varies greatly. In some *Sphinges* it is two or three times as long as the body; very short in many Geometrae, and in a part of the *Bombyces* it exists only in a rudimentary form.

The Abdomen is ovally elongated, or almost cylindrical in most species. It is composed of seven rings, each of which, again, is formed of a superior arc and of an inferior arc united together by a membrane. The former are a great deal longer than the others, and sometimes cover them with their edges in such a way that the abdomen below seems to form a gutter. This arrangement gives it the power of dilating itself considerably, as is to be seen in some females before laying. The organs of reproduction, peculiar to each sex, are placed at its extremity. The color of the abdomen, in most of the *Noctuae*, resembles that of the inferior wings. In the Cheloniae, the *Glaucopis*, and many species of Bombycidae, it is ornamented with colors not less brilliant than those of the wings.

The Wings attached to the superior lateral part of the thorax are always four in number, except in some females, where they are either entirely wanting or reduced to mere germs insufficient to enable them to fly. Each wing, considered by itself, consists of two membranaceous laminae intimately united together by their internal surface, and divided into numerous distinct parts by horny threads which are more or less prominent and called *nervures*. The two laminae, which constitute the upper and the under side of the wing, are covered with a farinaceous dust which is removed by the touch. With the aid of a microscope, and sometimes even by the naked eye, it is seen that this dust is a collection of small, colored scales, fastened into the membranous part by means of a pedicle, and arranged with the same symmetry as the tiles on a roof. Their form varies greatly according to the species, and even in the same species they are greatly diversified according to the part of the wing which they cover: they are generally much larger in the Heterocerata than in the Rhopalocerata; but no genus presents them more distinct or larger than the *Castnia*, in which they may almost bear comparison with those of certain fish. The colors, so various and so beautiful, presented by the wings of Lepidoptera, are due, not to the membrane, which is always transparent, but to the scales. No Lepidopter is destitute of scales; but in some they are so small and so few in number, that the wings are perfectly transparent, as in many Satyridae, etc.—

In the *Macroglossa* with vitreous wings, the scales in the centre of the wing are so little adhesive, that they disappear almost as soon as the insect has used them in flying.

The nervures are fistular, filiform organs, more or less ramified, which seem intended to support the two membranous laminae indicated above, and which constitute, properly speaking, the framework of the wing; they extend themselves in their ramifications from the base to the exterior edge of the wing. Their number, counting them from the exterior edge, varies from eight to twelve, and it is not always the same in the anterior and in the posterior wings.* It is the nervures that give to the wings their more or less diversified form which has been called the *section of the wing*, (coupe d' aile.)

The spaces comprised between the nervures are designated by the name of *cellules.*† These vary according to the arrangement of the former. The two most remarkable are the *discoidal cellules*, which we sometimes use to characterize tribes or genera.

The inferior wings, whilst they present an anatomical structure analogous to that of the superior wings, have always a form somewhat different. They are generally rounded, or ovally elongated, sometimes a little sloped and hollowed upon their internal or abdominal side. In the species of Rhopalocerata, where this side is not sloped, it is thin, downy, and membranaceous, and frequently forms, with that of the opposite side, a canal or gutter which envelopes the anterior part of the abdomen. The superior wings, on the contrary, approach more or less to a triangular form.

Besides their two faces, the wings present for our consideration various parts which have received the following names: the middle of the wing is generally called the *disc;* the part near the thorax, the *base;* and that which is opposite to it, where the nervures meet, the *posterior* or *exterior edge.* The two other edges take different names according as the reference is to the superior or to the inferior wings. In the former, the edge which is in front is called the *anterior edge*, *costal edge*, or simply the *side;* that which is opposite to this, which ought for that reason to be called the posterior edge, is called the *internal edge*, because in the Nocturna with roofed wings it is in contact with the body. In the second, the edge which we have called the costal or superior is generally designated by the name of the *external* or *anterior edge.* Finally, that which is in contact with the abdomen is called the *abdominal*

* Dr. Boisduval making considerable use of these nervures in his system of classification here gives a minute account of them which we may, at some future time, furnish for the readers of the Journal.—Tr.

† Kirby and Spence call them *areolets.*—Tr.

or *internal edge*. The external angle formed by the meeting of the anterior and of the exterior edge is called the *apex*, by which name also the adjacent part of the wing is sometimes called. The angle opposite to this is sometimes called the *internal* and sometimes the *anal angle*.

The exterior edge of each wing is bordered by a row of small hairs which are very serrate, somewhat scaly, and more or less long, generally more developed and larger in the Heterocerata than in the Rhopalocerata; this has been named the *fringe*. This is sometimes of a different shade from the ground of the wing; sometimes it is of a uniform hue and sometimes variegated.

In regard to colors, the wings of Lepidoptera present as great a variety as the corollas of flowers. To tints the most vivid they sometimes unite the lustre and brilliancy of metals and the clearness of pearls and precious stones. In no other race of animals has nature been so prodigal of ornament. But it is generally in the tribes that fly by day that the colors have the greatest brilliancy. In the nocturnals they are rather sombre, and the wings of these latter are rather remarkable for the originality of their designs than for the variety of their colors.

Although no general rule can be laid down for the distribution of colors, and they do not constitute a fixed character, yet it is to be remarked of them as of plants, that certain hues appear to be affected by certain genera of Lepidoptera. Thus most of the *Pierides* are white; the *Erebiae*, black, etc.

The design is a more constant character, and in certain circumstances it is more useful for determining the genera than the palpi and the antennae. Sometimes it is sufficient to see a mere fragment of the wing to determine, without mistake, to what genus the Lepidopter, of which it is a part, belongs.

The Legs, as in other insects, are composed of five parts: the hip *(coxa)*, the trochanter, the thigh *(femur)*, the shank *(tibia)*, and the tarsus. This last has always five distinct articulations, without counting the terminal hooks, which sometimes form a decided claw, as in the case in the *Acherontia atropos*, or they are so strong as to scratch the skin. In most tribes the six legs are of equal length, but in some the two fore legs are quite short so as to be unfit for walking; the latter are termed *tetrapodes*, the former *hexapodes*. The legs are generally more or less hairy or scaly.

The posterior tibiae have sometimes two and sometimes four small acicular points more or less developed, and designated by the name of *spurs*. When there are four, two are placed near the extremity, and two near the middle of the inward side.

A BAT AND HER YOUNG.

(VESPERTILIO.)

Last summer, a boy brought me a family of bats, consisting of the mother and three children. The parent was clinging to a twig of cherry, whilst the young, which were about an inch in length, were hanging to the teats of the mother. I was interested in this family and for 12½ cents the whole concern became my property. I was delighted with the maternal solicitude of the parent—nothing would alarm her, or induce her to abandon her tenderly cherished offspring. The boy had treated her roughly; he had carried her several miles from the country; crowds of noisy urchins had gathered around him—they had poked sticks into her ribs and all sorts of "fun" at her, but she would not leave her children. I took her in for pity's sake, as well as for other reasons, and thought that such fidelity ought to be rewarded. I put her into a neat mouse cage, and determined to devote much attention to the rearing of my interesting charge. She immediately suspended herself at the side and her young followed. I presumed she was hungry. I tempted her appetite with every insect "delicacy of the season," but she would not eat. I held flies to her nose, and made them buzz about her ears, but she heeded them not. I concluded she was modest and would not eat in the presence of strangers, and retired, but the food remained untouched. "She will eat at night," thought I; but next morning I discovered that she had fasted. I was beginning to be alarmed. I plainly perceived by the motions of the young that she had been milked dry, and if she took no food, no more of the lacteal fluid could be elaborated, and the young, at any rate, must perish. I returned in the evening, and lo! *Mrs. Verpertilio* had died! two of the youngsters lay breathing their last—the third was still trying to draw nutriment from the dead mother's breast! It was a painful sight. I thought of a description of the plague I had once read, in which infants were seen still endeavoring to suck from the corpses of their mothers. What could I do? I put an end to the misery of the survivor and preserved the whole family in spirits.

The bats belong to a *stirps* called *Cheiroptera*, signifying *wing-handed*. Their distinguishing character consists in a fold of the skin commencing at the side of the neck, which extends between the fore feet and toes, supporting them in the air and enabling them to fly. These singular animals would at first sight seem to possess a middle state between quadrupeds and birds. An old writer says, "it is too much of a bird to be properly a beast, and too much of a beast to be properly a

bird." The skin of the wing is extremely thin and is generally devoid of hair on both sides. It extends not only between the fingers, but from the last finger to the posterior extremity, and from this to the tail, when one exists. The toes of the hind feet are short and furnished with claws, by which the bats suspend themselves from the trees or walls on which they rest, hanging with their head downwards. They walk with slowness and difficulty when placed on the ground; the wings are folded up; and they rest upon the hind feet and upon the claw of the thumb, by which they crawl forwards, pushing on first one side and then the other. But they can climb up perpendicular surfaces with considerable agility.

They live on insects and fruits—are nocturnal in their habits and hybernate in caves and ruins. They spend the winter in a state of torpidity, suspended in some dark hole by the feet. During this state, the ctrculation is so slow, that it is hardly perceptible. There is a total suspension of the power of the digestive organs. From the experiments of Spallanzani, it would almost appear, that a total suspension of the vital energy takes place in animals, during this state of torpor. He kept a torpid bat four hours in carbonic acid gas, the thermometer marking twelve degrees: yet it continued to live in this, which is so very deleterious, that a bird and a rat, which he exposed to its influence at the same time, perished instantaneously.

The bat is apparently a very disproportionate animal, and yet perfect in its kind; it is ugly and yet if it were otherwise, it would not answer the end of its creation. Its head is very much deformed. In some species the nose is hardly visible. The eyes are sunk near the tip of the ear and are confounded with the cheeks. In others, the ears are as long as the body, or else the face is twisted in the shape of a horse-shoe and the nose covered with a kind of crust. Their motion in the air is with less propriety termed a flight, than a kind of uncertain flutter, which they seem to execute by struggles and in an awkward manner. In thus flying about in the evening they seize all the gnats, moths and other nocturnal insects that come in their way, which they swallow entire.

Their eyes are small, but they see, hence the phrase, "blind as a bat" is not true. Their hearing is very keen, and they can direct their flight with perfect correctness even when deprived of their sight. Spallanzani tried numerous experiments, and after depriving bats of their eyes and so far as possible of hearing also, they were still capable of directing their flight with security and accuracy, finding their way through passages just large enough to admit them, without coming in

contact with the sides. There are seven or eight species of bat in our country. J. G. M.

IVORY NUT. *(Phytelephas Macrocarpa.)*

A few weeks ago on coming into my study, I found on the table two rough, brown nuts, nearly the size of a hen's egg, with a note by the side of them marked, "From a friend." One of them had been in a lathe and the half of it beautifully turned, and finer ivory I thought I had never seen. My knife made no impression on it, and altogether it was a remarkable thing. I am extremely obliged to the unkown donor, for he has added a rare gem to my cabinet. Accompanying the nuts was a printed card stating that they may be bought at L. I. Cohen's Stationery establishment, 138 William Street, New York. There is a very short and unsatisfactory account of it in the October No. of Silliman's Journal, p. 400, but from the "card" I have gathered the following information.

This extraordinary nut, from the solidity which it acquires at a certain age, is rendered an object of peculiar interest and astonishment to those who contemplate the wonderful economy of the vegetable world. The shell or outer covering, is barely as thick as that of the common hazel, and is so extremely hard that no instrument will make an impression on it; it is only removed from the kernel by pressure. Bears and other animals are said to eat the nut with avidity before it has acquired the solid state. It is common in the Mascaren Islands, where it is called the Tagua Plant. Persoon describes the nut as enclosed in a prickly head. The kernel in an early state contains a limpid liquor, which becomes milky and sweet and at length acquires the solidity of ivory.—The natives cover their cottages with the largest leaves, and the English manufacture all kinds of fancy articles from the nut, which in color excels the elephant ivory. J. G. M.

STAR NOSED MOLE. *(Condylura Chistata.)*

Last 4th of July I was out in the woods with the Sunday School children. The boys raced through the forest "like all possessed;" the girls were swinging, or playing "catch me who can;" not a few parents were looking on the enlivening scene and apparently enjoying it as much as their children; the tables were preparing for a rich repast, and all seemed happy. I observed a whole *troupe* of roystering youngsters rushing towards me, and it was evident something strange had been

found. On previous occasions of a similar nature, and indeed all the year round, every queer thing is at once brought to me not only by juveniles, but by others of larger growth. One of the boys held in his hand a dead mole, which he had just killed. I did not even touch it at first, not feeling disposed to be annoyed, for not less than fifty were gathered round me, and all evincing the most eager curiosity in a more audible manner than mere looks. A second glance at the animal changed my mind, and I grasped it with intense delight. It was not the common mole, but the strange *star nosed* or long tailed mole, which occurs in this neighborhood very rarely. Indeed, I had never seen it before, although I recognized it at once, for its characteristics are very striking. It is figured in Godman's Natural History, where there is also a description, but I have not that work at hand and cannot use it in this brief notice. I soon pointed out its peculiarities, and the adults seeing an excited crowd of boys around me, also drew near, and to satisfy all I was obliged to deliver a short lecture on the star nosed mole. Not a man on the ground had ever seen a specimen before, though some of them had been brought up in the country. I rewarded the captor and bagged the animal.

This mole differs from the common one in several important respects. Its tail is more than half the length of the body—the head has a slender elongated muzzle, terminating in a vertical circular disk of from eighteen to twenty subequal cartilaginous fibres. They radiate like a kind of star, but I am not aware of their particular use.

This mole burrows in moist places near the surface, forming elevated ridges, like the common species, and chambers for rearing its young.—They are most numerous near the borders of streams. When observed in confinement, they continually attempt to hide themselves by digging, and the cartilaginous tendrils around their nose are in perpetual motion.

HONOR TO WHOM HONOR IS DUE. *The American Glazier.*

The introduction of the Mariner's Quadrant into present use forms a chapter in nautical history equally as important as that of the compass itself; the one serving as a directory to the seaman in his general course—the other enabling him to follow it with precision. Dr. Ewing, who has been pronounced one of the most learned and acute mathematicians this country has produced, says that it is the most useful of all astronomical instruments the world has ever known. Those formerly in use were very defective, and, under most circumstances constituting real danger, were of comparatively little service. The application of a

new principle was necessary, by which the exact latitude in the pathless ocean, even amid the most agitating storms, might always be ascertained.

The invention of the instrument upon the optical principle of double reflection, justly belongs to Godfrey, a native of Pennsylvania, and affords a beautiful illustration of the faculty possessed by some individuals of turning to profit the results of casual observation. Whilst, on a certain occasion, he was replacing a pane of glass in a window opposite a pump, a girl, after filling her pail, placed it on the side walk. Turning round, Godfrey observed the rays of the sun reflected from the window into the bucket of water, and a second time from the surface of the water to the eye. His philosophic mind at once seized upon the incidental occurrence, and applied the principle to the construction of an instrument with which he could draw the sun down to the horizon by means of a contrivance decidedly superior to any that had been known for the purpose of ascertaining angular measurements.

In addition to our own citizen, the merit of the invention has been attributed to three individuals; to Dr. Hooke, whose instrument admits of only one reflection and therefore is not adapted to the object intended; to Newton, whose description of it was communicated to the President of the Royal Society, but by him was, for some reason, suppressed; and to Hadley, to whom the credit has been most generally ascribed.

Abundant testimony, we think, can be furnished to establish the claim of the American gazier to the honor; and the most conclusive is the letter addressed to Dr. Halley, President of the Royal Society, by the celebrated James Logan, an individual not only prominent in the early annals of this state, and at one time Secretary of the Commonwealth, but also devoted to literature and the advancement of science. In this letter, Mr. L. establishes the fact, that the Quadrant was not only invented many years before the discovery of Newton's description, but was actually in *use* before the date of Hadley's claims. Godfrey first constructed a model in wood and afterwards in brass. An experiment of its adaptation to the purpose designed was made in 1730 during a voyage to the West Indies. In Jamaica it was exhibited to the Captain of an English vessel, who took a description of it—some say the instrument itself—and gave it to Hadley, a mathematical instrument maker in London, who, after making some slight modifications in the construction, procured a patent for it. The statement of Dr. Franklin, one of Godfrey's cotemporaries, may also be regarded as authoritative. In his diary we find the subjoined passage: "Among the first members of our junto, was Thomas Godfrey, a self-taught mathematician, great in his

way, and afterwards inventor of what is now called Hadley's Quadrant." Even the Royal Society, in investigating the claims of the rival candidates, expressed the opinion that both Godfrey and Hadley were original inventors and entitled to the honor. Hutton, the Edinboro' Professor, (a name connected with many pleasing reminiscences, and around which the most interesting associations cluster,) says, the truth may probably be, that each of these gentlemen discovered the method independently of one another.

From the following language employed by Mr. Walsh we naturally conclude that Godfrey must, with very remarkable talents, have possessed an intuitive genius, which enabled him to conquer the most abstruse points connected with the exact sciences. "When Newton's Principia made its appearance, the best mathematicians were obliged to study them with care, and those of a lower rank durst not venture upon them till encouraged by the testimony of the learned. Godfrey, without encouragement from any quarter, wholly self-taught in the Mathematics and in the Latin, ventured upon and mastered this great work at an early age. Truly he cannot fail to attract the highest admiration for the strength of his intellectual powers and the resolution and perseverance of his spirit."

Logan, in his communication to the Royal Society, thus refers to him: "A young man, born in this country, Thomas Godfrey by name, by trade a glazier, who had no other education than to learn to read and write, with a little common arithmetic, having in his apprenticeship with a very poor man of that trade accidentally met with a mathematical book, took such a fancy to the study, that by the natural strength of his genius, without any instructor, he soon made himself master of that, and of every other kind he could procure or borrow in English; and finding there was more to be had in Latin books, under all imaginable discouragements, applied himself to the study of that language, till he could pretty well understand an author on these subjects; after which, the first time I saw or heard of him, he came to borrow Sir Isaac Newton's Principia of me. Inquiring of him who he was, I was indeed astonished at his request; but after a little discourse, he soon became welcome to that or any other book I had."

Godfrey was not more than twenty-six years of age when he invented the Quadrant, and evinced such a thorough acquaintance with the Mathematics and the Latin; and his success in the acquisition of knowledge under the most discouraging circumstances, furnishes another proof of the correctness of the adage, *Resolution is omnipotent.* Z.

A Discourse on Instinct, with an analytical view of the researches on Fossil Geology. By Henry, Lord Brougham, F. R. S. and Member of the National Institute of France.

An interesting book, on an interesting subject. The name of the author is a sufficient guaranty for compensation for the labor of examining his lucubrations. His subject is one which has always, and must ever continue to interest the learned and the unlearned. Who has not seen the operations of that mysterious power denominated instinct? Who has not wondered at its productions? Who has not sought a solution of them and sought in vain? The most unphilosophic minds cannot fail to ask from what do these actions spring, and what is the secret moving power that gives them birth? If no satisfactory response has ever rewarded their enquiries, the most gifted sages and those most deeply read in nature's works, have not been more highly favored.—Speculation after speculation has been indulged, theory after theory invented, but to this day—and we look for no better result in any near future—the arcanum remains unrevealed. The student of God's wonderful works can observe and record the phenomena; he can see the hand of the great Architect of the Universe and point it out to others; he can admire and adore, and then his work is done. How can he find a clue to results which indicate reason, and often a high degree of it, where there is none? He may say, this is the hand of God; his agency is directly employed in these phenomena; but even then he is suspicious of some immediate agency, and is not convinced by his own deductions. With these convictions, whilst we concede to our author's facts the highest interest, and to his speculations the praise of much ingenuity, we cannot feel as we rise from the examination of his attractive pages, that we understand instinct, considered in itself, better than we previously did.

It is easy to overturn the atheistic speculations on this remarkable property of animated existence, to show negatively that it is not one thing and that it is not another—that it is inexplicable on any particular principles—but when we come to the positive part of the subject, we must falter and plead inability to respond. Lord Brougham discourses thus, after having presented a great variety of the most interesting facts illustrative of instinct, after having examined various views which have been broached concerning it, and sought to illustrate it by the light of his own penetrating and richly endowed intellect. One thing seems quite clear, that upon any view of this great question, whatever theory we adopt, all leaves the inference of design untouched; nay, the more

we inquire, the more we perceive that all investigation only places in a stronger light the conclusion from the facts to a superintending intelligence.

"Beyond all doubt it is so. The whole question is one of relations and connexions. Adaptation, adjustment, mutual dependence of parts, conformity of arrangement, balance, and compensation, every where appear pervading the whole system, and conspicuous in all its parts. It signifies not in this view whether we regard instinct as the result of the animal's faculties actuated by the impressions of his senses; or as the faint glimmerings of Intelligence working by the same rules which guide the operations of more developed reason; or as a peculiar faculty differing in kind from those with which man is endowed, or as the immediate and direct operation of the Great Mind which created and which upholds the universe. If the last be the true theory, then we have additional reason for devoutly admiring the spectacle which this department of the creation hourly offers to the contemplative mind. But the same conclusion of a present and pervading Intelligence flows from all the other doctrines and equally flows from them all. If the senses so move the animal's mind as to produce the perfect result which we witness, those senses have been framed and that mind has been constituted, in strict harmony with each other, and their combined and mutual action has been adjusted to the regular performance of the work spread out before our eyes, the subject of just wonder. If it is reason like our own, which moves the animal mechanism, its modification to suit that physical structure and to work those effects which we are unable to accomplish, commands again our humble admiration, while the excellence of the workmanship performed by so mean an agent impresses us with ideas yet more awful of the Being who formed and who taught it. If to the bodily structure of these creatures there has been given a mind wholly different from our own, yet it has been most nicely adapted to its material abode, and to the corporeal tools wherewith it works; so that while a new variety strikes us in the infinite resources of creative skill, our admiration is still raised as before by the manifestation of contrivance and of expertness which every where speaks of the governing power, the directing skill, the plastic hand. Nor is there upon any of these hypotheses room for doubting the identity of the Great Artificer of Nature. The same peculiarity every where is seen to mark the whole workmanship. All comes from a superior intelligence; that intelligence, though variously diversified, preserves its characteristic features, and ever shines another and the same."

This is a long extract, but it cannot weary him who reads it for the first time. It is gratifying to see with what decision the author recognizes the divine existence and attributes in the creatures which move before him. His contributions to Natural Theology, in this and in other works, have been important, and they are delightful. Paley, in his beautiful work on Natural Theology, defines instinct thus: "It is a propensity prior to experience, and independent of instruction." Lord Brougham distinguishes between instinct and animal intelligence, and theorizes upon both, and furnishes illustrative facts. We suppose that all the facts must be referred to the same general principle, and find their solution in the same agency. The modifications of instinct, the deviations from the normal course, which are exhibited in animal operations, are no doubt very remarkable, but, except for the purpose of comparison and distinction, we cannot see that any thing is gained by a separation of them in classification. Those actions of animals that are uniform, which descend from generation to generation unchanged and unmodified, which are perfectly performed at once and with no means of instruction, are purely instinctive, according to our author. He adduces such facts as the following as indicative of intelligence, additional to instinct: "The Jackdaw, when he found his beak could not reach the water he wanted to drink, threw into the pitcher pebble after pebble till he raised the surface of the liquid to the level of his beak."

Our space forbids enlargement. We recommend the work to our readers as very instructive and attractive. The production of a man of profound science, it is sufficiently popular. No one can read it without profit. No one can master its contents without being a wiser and possessing the materials to make him a better man.

A complete Lexicon of the Latin Language, for the use of schools and private study. By Dr. Wm. Freund.

This work contains over seventeen hundred pages of closely printed matter, two vols. in one, the first published in 1844, and the second in 1845. It is therefore, in this form, just from the hands of the author, and comes to us as the most recent dictionary of the Latin language.—This must not be confounded with a much more extended work on the same subject, a notice of which, with a translation of the author's preface, appeared in the Bibliotheca Sacra for last February. The larger lexicon, which is not yet completed, both in its arrangement and contents, is represented as deserving the first place among works of this kind, both in the Latin and Greek languages.

The lexicon which we now bring into notice appears not to be an abridgement of the large work, and yet exhibits some of its most important features. It purports to contain all the words of the old Latin language, including the proper names, until the decline of the Roman Empire in the west. Also the most important of the middle and new Latin words, namely those which have passed over into the modern European languages, as also the Latin and latinized expressions used in the arts of Medicine, Surgery, Anatomy, Chemistry, Zoology, Botany, etc. The distinction between the classic and unclassic words, is clearly made throughout the work, whilst the Ciceronean phraseology is made the classic basis.

From the translated preface to the larger work, we learn the principles which guided the author in the construction of his dictionary.—Lexicography, he states, is the science which sets forth the nature of every simple word of a language through all the periods of its existence. The history of a word is external and internal. The former unfolds its outer nature, viz. form, class, syntactical relations, &c. The latter exhibits its meaning. Uner the external history of a word are embraced the *grammatical* and *etymological* elements. Under the internal are included the *exegetical* element; the *synonomous*, which compares and distinguishes words resembling each other in meaning; the *chronological*, which teaches to what time a word, or form, or meaning belongs; the *rhetorical*, which informs us whether a word belongs to prose or poetry, whether it is a technical term of religion, rhetoric, philosophy, &c.; and the *statistical*, which states whether a word is of frequent or rare occurrence.

Now let us ascertain whether in the smaller work these elements are recognized, and how they are worked out. Under the grammatical element we find all the words referred to in the preface of the large work. *Baculum—i. n.* (*baculus—i. m.*) seldom and unclassical. *Ad*, prep. with the accusative, also *at*, old form *ar*, as arbiter for adbiter, from adbito; see the verb. It is contrasted with *ab*, which expresses whence, and, *in*, into.

The etymological element, whilst it does not reject comparative philology, is restricted to the elucidation of the origin of the word under consideration. The author does not suppose that it is within the province of a lexicon of a single language to trace out the comparative method to its ultimate results. Take the verb *fĕro* as an illustration:—*Fĕro*, *tuli*, *latum*, *ferre*. The reduplicated form of the perfect *tetuli*, Plautus; *tetulisti*, Attius; *tetulit*, Plautus; *tetulerunt*, Lucretius; *tetulissem*, Terence; *tetulesse*, *tetuleso*, *tetulerit*, Plautus. *Fero* compared

with φερω; *tuli* and *tetulo* from *tulo*, *tolo* i. e. *tollo*; *latum* from *tlatum* compared with τλαω, τλητος, &c.

In the exegetical part of the work, which is unquestionably the most important, the author lays down two principles. First: Among several significations of a word, that is the original one, which is derived from its etymology. Second: In the order of meanings, the original one properly precedes the tropical. In addition to this he finds it necessary frequently to subdivide the tropical meanings. Thus the word *arena* is arranged (1) lit. sand. (2) The place of contest in the amphitheatre bestrewed with sand. Therefore (3) every place of contest, place of exercise, &c. Thus beautifully does he develope one meaning from the other in the order of nature.

Without dwelling on the specific elements involved in this lexicon, we present a single word as an illustration of his whole mode of developement, in the various relations in which it may be placed. *Ingenium*, during the existence of the Latin as a national language, in its first and fundamental meaning, signified *natural disposition*, *nature*, &c. From this many derived significations are developed. In particular reference to man in respect to character, it signifies *natural temperament* viewed in its sensuous aspect. Again, in respect to his intellectual nature, it means *talent*, *ability*, *spirit*, &c.; from this last word it derived the sense of *genius*, *penetration*, &c. In the farther developement of the word it passes from the abstract to the concrete in the post-augustan age, and in Suetonius, Tacitus, and Pliny, means *men of genius and spirit*, then an invention, then a machine, then an engine of war, &c. &c.

From a cursory examination of the work under consideration, comparing the principles laid down in the preface with their application in the body of the work, we are free to express our decided approbation of it; and to add, that for natural and thorough developement of the meaning of words, for logical analysis and classification, we are acquainted with no work of the kind that is worthy to be compared with it.

THE NEGRO BARD OF NORTH CAROLINA.

"*The Poetical works of* George M. Horton, *the colored Bard of North Carolina, to which is prefixed the life of the author written by himself.*"

The above is the title of a little work lately published, a short notice of which, as few of our readers are likely to meet with it, and as it is from such an unusual source, may not prove wholly uninteresting.—It is not the vain effort of some wit-starved Caucasian to counterfeit ne-

gro balder-dash, but it is the production of a genuine African struggling manfully to bear away the palm from his more favored competitors. It contains the fugitive effusions of a lowly, unlettered, unassuming *slave;* one whose duty it was to follow the plough from "morn till dewy eve," and who had leisure only during the darkness of night, "when no work can be done," to woo his humble, rustic Muse.

Northampton county, N. C., has the undisputed honor of giving birth to the poet, whence his master removed to Chatham, where, for ten years, George was "nothing but a poor cow-boy." About this time he grew exceedingly desirous of learning to read, which he accomplished by the slight aid afforded him by school children. He seized upon every leisure moment to pursue his studies, by night and on Sundays, until, in his own words, "by close application to my books at night, my visage became considerably emaciated by extreme perspiration, having no lucubratory apparatus, no candle, no lamp, nor even light-wood." George is evidently partial to what Horace terms "verba sesquipedalia," and all his sentences, in prose especially, are marked by having "their linked sweetness long drawn out." Whether this wordiness is a characteristic of his race, or whether he copied the vice from his American masters, we will not stop to enquire. But the reader will be more interested in his own narrative: "In 1815, he (his master) moved into Chatham where my opportunities became a little expanded. Having got into the way of carrying fruit to the college at Chapel Hill, on the Sabbath, the collegians, who for their diversion were fond of pranking with the country servants who resorted there for the same purpose that I did, began also to prank with me. But some how or other they discovered a spark of genius in me, either by discourse or otherwise, which excited their curiosity, and they eagerly insisted on me to *spout* as they called it. This inspired in me a kind of enthusiastic pride. I would stand forth and address myself extempore before them as an orator of inspired promptitude. But I soon found it an object of aversion, and considered myself nothing but a public ignoramus. Hence I abandoned my foolish harangues and began to speak of poetry, which lifted them still higher on the wing of astonishment; all eyes were on me and all ears were open. Many were at first incredulous, but the experiment of acrostics established it as an incontestable fact. Hence my fame soon circulated like a stream through college. Many of these acrostics I composed at the handle of the plough and retained them in my head, being unable to write, until an opportunity offered, when I dictated, whilst one of the gentlemen would serve as my amanuensis. I have composed love pieces in verse for courtiers from all parts of the

state, and acrostics on many of the tip-top belles of Virginia, South Carolina and Georgia."

Thus many a learned collegian, deep-versed in the erotics of all the love-sick poets, from Anacreon of Greece to his worthy successor of the Emerald Isle—that glorious child of love and god of song, Tom Moore—has been well content to draw upon this rude bard for lines of love and words of fire, with which to woo and win his chosen fair. A quarter of a dollar was the price at which they were set, but from their liberality he often received more. He has been for several years a contributor to the "Southern Literary Messenger;" and the fame of his wonderful natural powers, already great, is more widely spreading. Before closing, we cannot forbear giving a few specimens of his poetical powers:—

EARLY AFFECTION.

"I loved thee from the earliest dawn,
  When first I saw thy beauty's ray;
And will until life's eve comes on,
  And beauty's blossom fades away;
And when all things go well with thee,
With smiles or tears remember me.

I'll love thee when thy morn is past,
  And wheedling gallantry is o'er,
When youth is lost in age's blast
  And beauty can ascend no more;
And when life's journey ends with thee,
Oh then look back and think of me.

I'll love thee with a smile or frown,
  'Mid sorrow's gloom or pleasure's light,
And when the chain of life runs down,
  Pursue thy last eternal flight:
When thou hast spread thy wing to flee,
Still, still a moment wait for me."

With such a meagre and insufficient education, daily employed with his degraded caste in menial employment, we should not expect to find him a model of classic beauty, or refined purity; nay, we should be prepared to see many gross philological blunders—much which the nice precision of an Addison would have pruned away—many offences against the rigid rules of the saintly Murray. We give two stanzas of his lines on "the death of a favorite chamber maid."

O Death! thy power I own,
  Whose mission 't was to rush
And snatch the rose so quickly blown
  Down from its native bush;

The flower of beauty doom'd to pine,
Ascends from this to worlds divine.

Death is a joyful gloom,
Yet tears of sorrow dry,
The rose on earth but fades to bloom
And blossom in the sky.
Why should the soul resist the hand
That bears her to celestial land."

We should like to give more extracts, but our limited space forbids it. Whether by his example he will succeed in removing the doubts as to African genius, which in his introduction he alleges to be one inducement for the publication of his poems, time will develope. If he does, then indeed may we conclude "Poeta nascitur." To those, into whose hands this extraordinary little volume may fall, we would say, remember the difficulties under which its lowly author struggled, and we are sure you will

"Be to his faults a little blind,
And to his merits ever kind."

RHADAMANTHUS, JR.

AIR-TIGHT STOVES.

Having enjoyed the advantages of an air-tight stove for one whole season and a part of another, and being therefore able, from ample experience, to give an opinion, we deem it but an act of kindness to recommend stoves of the same kind to others. In nothing relating to the domestic economy, does there seem to have been made a greater improvement and a nearer approximation to perfection, than in the means of the production and the proper appplication of heat. When it is remembered that fuel forms a very important item in family expenditure annually, every one must be interested in the question, what is the best means of economizing it, and at the same time of enjoying a well regulated temperature. It is a matter of no small moment to us, living as we do, in a climate requiring artificial heat for six months in the year, to know how we may most easily render ourselves comfortable during that time.

It may be well to premise, that the heat derived from combustion, is thrown into the apartment to be warmed, first, by its radiation either directly from the burning mass, or indirectly through the medium of an absorbing and radiating body; and secondly, by the heated air and gaseous

products of combustion imparting it to the interposed heating body, from which it is, as before, distributed.

In the case of *open fires* and *Franklin stoves*, the heat, which is effective, is scarcely more than that which is radiated from the burning mass into the room, whilst that portion, which is due to the heated air and gaseous products of the combustion, is carried off without producing any useful effect. In this way perhaps nine-tenths of the whole heat evolved is lost. Many indeed are the praises bestowed upon an open blazing fire. There is no doubt something cheerful in being seated by its side, in looking upon the curling flames and the glowing embers, and in receiving the grateful warmth which emanates from them, whilst time is beguiled in conversation with a friend, or the winter evening is spent in the happy family circle. But there is no doubt more poetry and sentimentalism in the idea, than real benefit derived. It cannot escape the most careless observer that there is not much economy, or, in cold weather, much comfort in such a fire; or that the quantity requisite to produce comfort is enormously great, compared with other means of producing the same result.

In the case of the ordinary *close stoves*, the effective heat is much greater than in the case just noticed. Both the radiant heat from the burning mass, and a part of that of the gaseous products are received by the parts of the stove and the pipe which surround them on all sides, and radiated by them to the different objects in the room. Hence the close-stove is a great improvement upon the open fire or the Franklin stove. But even here, a loss of perhaps nearly three-fourths of all the heat generated is sustained, in consequence of the imperfect joinings of the different parts, on account of which, to prevent smoking, a strong draught is always rendered necessary. Through the large opening at the bottom of the front door and the large pipe a strong current is established, carrying up with it the heated products of combustion, &c., before they can impart their caloric to any of the heating surfaces. This is evident to any one who remembers, that an upper room is often comfortably heated by a part of this waste heat by means of a drum. The waste is just in proportion to the strength of the draught. The ten plate stove, *when the side doors which enclose the oven are kept open*, is more effective in throwing off heat than the eight plate stove, because then a greater heating surface is exposed.

It would obviously be a great gain if the heat of the heated air and gaseous products, which is lost in the ordinary stove, could be economized, or made to add its influence to that which is radiated from the fuel. If, for instance, a valve or *damper* were inserted in the pipe, the

draught might be so reduced as to give time for the heated air, &c. to give out a large portion of their caloric by contact to the upper parts of the stove and pipe, and thus afford it by radiation to the room. But in order that the stove may not smoke, or give off carbonic acid, and other volatile matters, which are injurious to health, into the room the seams must be air-tight. This, then, is the principle of the *air-tight stove.*—The seams are all made so as to fit accurately, the pipe is furnished with a valve, or there is a bonnet or hood in the inside of the stove, extending some distance below the insertion of the pipe, and the door in front, through which the fuel is introduced and by which also the draught is in part regulated, is made to slide closely. The pipe is inserted at about three inches below the top of the stove, and should descend a little towards its entrance in the fire-board, which should also fit closely in the hearth, and have a small valve at the bottom to permit any air, which may be forced down the chimney during stormy weather, to enter the room without passing through the stove so as to prevent smoking. By means of the valve and slide in front, the draught may be so regulated as to permit no more air to pass through the stove than is necessary to afford the requisite amount of oxygen for combustion, and that little more than the gaseous products, viz: carbonic acid, watery vapor, pyroligneous acid, creosote, and the residual nitrogen, all greatly cooled by having first given off their heat to the stove by contact, may pass up the flue. So much is their temperature reduced, when the valve is used, that water and pyroligneous acid are condensed in the pipe beyond the valve, and hence the necessity of having the pipe to descend towards the fire-board, so as to permit the acid to fall upon the hearth, and not to drop into the room. If the draft is strong, these products will be carried up the chimney. Some think that the valve is unnecessary, and say that the sliding door may adjust the draught, and that no more air will pass through the pipe than enters in front; whence many of the recently made air-tight stoves are without the valve. But it might easily be shown that this reasoning is based upon a philosophical blunder.

Air-tight stoves are made of various forms and of various degrees of complication. The most simple form, and which may serve as an illustration of all that it is necessary to state at present, is the oval, with flat top and bottom. The latter may be of cast or sheet-iron; the sides are made by bending a sheet of sheet-iron in oval form, and joining it accurately to the top and bottom. As the stove is never permitted to become red hot or even near that temperature, the sheet-iron will last, with fair usage, a man's life time; there is no danger of its *burning out.*

An air-tight stove made as hot as an ordinary stove would be intolerable; but this it will never become, unless the passages are left open by neglect.

When the fire is kindled, or fresh fuel put in, the sliding door in front is first moved nearly down, so as to afford room for the entrance of no more air than is sufficient to produce the requisite combustion, and then the valve, if it be used, may be gradually turned until the draught is somewhat checked. When the stove is to be opened, the valve must always be opened first, and then, if the front door be not too suddenly opened, *no explosion can take place.* If this order be followed there is no more danger in the use of this kind of stove than any other.

The advantages of stoves of this kind are very great and numerous. First, there is a *great saving of fuel.* In very moderate winter weather four or five sticks of hickory wood, of about three inches in diameter, and eighteen in length, will keep a room of about fourteen feet by twenty-one, perfectly comfortable during the whole of the twenty-four hours. In colder weather, when the thermometer ranges near 0°, about ten such sticks will give the requisite temperature for the same length of time; whilst a common ten plate stove would consume about two dozen or more of sticks of the same size in that time. Secondly, the making of the fire need be attended to only about four times per day, and thus a *great deal of trouble and attention is spared;* indeed once making of the fire would be sufficient; for the whole charge of fuel for the twenty-four hours might be put in at once, but then the wood at the sides lies between the fire and a part of the stove, and prevents that part from giving out as much heat as it would do, if there were only about three or four sticks in at a time. It is therefore better to lay on only about that number of sticks at a time. In addition to this, *the stove requires very little regulating.* A little experience will enable any one to give the necessary draught by the front door and valve almost at once. The *self-regulating* variety of this stove is still more convenient. The charge of wood for the time intended, is put in at once, and the regulator set to any desired temperature, and then no more attention is required until the fuel is consumed. The regulation is effected by means of a strap of brass or copper rivited at one end fast to the top and lying with its whole length against the top; the other or free end acts against a short lever, and this against the short end of a longer lever, the long end of which turns the valve, which admits or shuts off the air. But the stove must be seen, in order that this part may be well understood. This seems to be the perfection of the means of warming an apartment. It is a perfect luxury; no one, who has had the use of such an appara-

tus for one winter, is willing to do without it. Thirdly, the *temperature* of the room thus warmed, *is uniformly the same throughout the whole day.* There is no sudden oppressive heat for half an hour after fresh fuel has been introduced into the stove, producing perspiration and uneasiness, and then followed by an unpleasant chilliness, unless the fire is watched and immediately re-renewed. And fourthly, the temperature being always of the moderate kind, headaches and other inconvenient feelings, which are often complained of as resulting from the use of ordinary stoves, are not so common with the use of this.

Unhesitatingly would we therefore recommend this kind of stoves to the community at large, being well assured that they have the advantage over all others, whether economy, convenience, or comfort be consulted.

THE LUTHERAN OBSERVER.

We cannot but express our regret at the course which the Editor of the Lutheran Observer has pursued in reference to an article published in this Journal. Professing to be alarmed at the tendency of Dr. Patterson's able articles upon Ethnology, he made a most uncourteous and undignified assault upon that gentleman. Of course, we have no objection to any one, least of all the editors of our weekly papers, canvassing the merits of any article which makes its appearance in our Magazine; on the contrary we consider it a compliment, and are perfectly willing to submit to any fair award which the public may pronounce upon our performances. We do not, therefore, contest the right of the Lutheran Observer, or of any one else, to endeavor to expose any errors into which he supposes our contributors have fallen. But we think that editors are just as much bound to observe the laws of courtesy and of honorable controversy as any other body of men. Our great complaint against the Observer, therefore is, that, whilst Prof. Patterson deprecates the doctrine of materialism, and explicitly denies that it is fairly deducible from his views of the nature of man, the editor of that paper not only insists that this consequence is logically derived from his premises, but also calls in question Prof. P's. honesty in making this disclaimer. Any one, we think, who calmly and dispassionately reads the Professor's articles in question, must see that the physical fact, which no one can deny, is there set forth, that the manifestations of mind are invariably connected with brain or nervous matter, and that in man, in whom those manifestations are of the highest order, that nervous matter is most perfectly organized. Now this is an ultimate fact, as far as physical researches can go, and is not inconsistent with the idea that the mind, using the brain as its material organ, presents manifestations of an order just in proportion to the perfection of its instrument. To the charge, therefore, of the Editor of the Observer against Prof. P., neither he nor his friends can give any other answer than silence, and where Prof. Patterson is known it can only injure him who makes it.

PENNSYLVANIA MEDICAL COLLEGE,

Filbert above Eleventh street, Philadelphia, Pa.

MEDICAL FACULTY AT PHILADELPHIA.

WM. DARRACH, M. D.—*Prof. of Theory and ractice of Medicine.*
JOHN WILTBANK, M. D.—*Prof. of Obstetrics and Diseases of woman and children.*
WM. R. GRANT, M. D.—*Prof. of Anatomy and Physiology.*
H. S. PATTERSON, M. D.—*Prof. of Materia Medica.*
D. GILBERT, M. D.—*Prof. of Principles and Practice of Surgery.*
W. L. ATLEE, M. D.—*Prof. of Medical Chemistry.*

GETTYSBURG FEMALE SEMINARY.

At this Institution is taught all that is considered essential to a finished education, including Instrumental and Vocal Music, Drawing, Painting, Languages, Ornamental Needle Work, &c.

The boarding department will at the next session be removed to the pleasantly located residence of the Principal, known as Oakridge; the the pupils will then be members of his family.

Several gentlemen of distinguished literary and scientific attainments will deliver frequent addresses throughout the course, on subjects of interest and importance.

The institution is well supplied with experienced and successful teachers, and with a valuable and increasing collection of Philosophical and Chemical apparatus, Minerals, Shells, Zoological specimens, &c.

H. HAUPT, *Principal.*

Pennsylvania College, Gettysburg, Pa.

FACULTY AND INSTRUCTORS.

Rev. C. P. Krauth, D. D.—*Pres't and Prof. of Ev. of Christ., Moral Philos'y, &c.*
Rev. H. L. Baugher, A. M.—*Prof. of Greek Language, Rhetoric, &c.*
Rev. M. Jacobs, A. M.—*Prof. of Mathematics, Chemistry and Mechanical Philos.*
Rev. W. M. Reynolds, A. M.—*Prof. of Latin, Mental Philosophy, &c.*
M. L. Stoever, A. M.—*Prof. of History and Principal of Preparatory Department.*
Rev. Chas. A. Hay, A. M.—*Prof. of German Language and Literature.*
Herman Haupt, A. M.—*Professor of Mathematics.*
W. H. Harrison.—*Assistant Prof. of Languages.*
David Gilbert, M. D.—*Lecturer on Anatomy and Physiology.*
Rev. J. G. Morris, D. D.—*Lecturer on Zoology.*
Wm. Albaugh, A. M.—*Tutor and Teacher in Preparatory Department.*
Mr. H. R. Geiger.—*Teacher of Writing.*

Pennsylvania College has now been chartered about fourteen years. During this time its progress has been such as to gratify the most sanguine expectations of its friends. The course of studies is as extensive and substantial as that of any Institution in the Country. The *Preparatory Department* provides for instruction in all the branches of a thorough English, business education, in addition to the elements of the Mathematics and Classical Literature. The *College Course* is arranged in the four classes usual in the Institutions of this country.

The government of the students is as energetic as their circumstances seem to require. They attend at least two recitations a day, Church and Bible Class on the Sabbath, and are visited in their rooms so frequently as to preclude the danger of any great irregularities. It is believed no Institution in the United States has more exemplary young men in connexion with it. They are all required to lodge in the College Edifice, special cases excepted.

The annual expenses are—for board, tuition and room-rent, during the winter session, $61 87½; for the summer session, $11 87½. Washing, $10 00; and Wood, $3 00. Total expense, $116 75. Boarding can be obtained in town at $1 25 per week.

There are two vacations in the year, commencing on the third Thursdays of April and September, each of five weeks continuance.

Terms of the Record and Journal. *One Dollar per annum in advance.*

Address—"*Editors of the Record and Journal, Gettysburg, Pa.*"

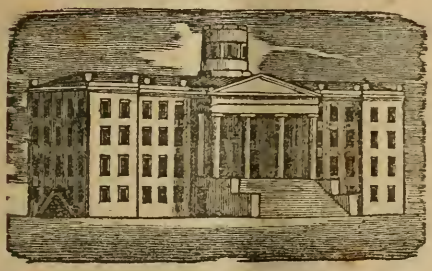
VOLUME II.] [NUMBER 3.

THE

LITERARY RECORD AND JOURNAL

Of the Linnaean Association of Pennsylvania College.

JANUARY, 1846.



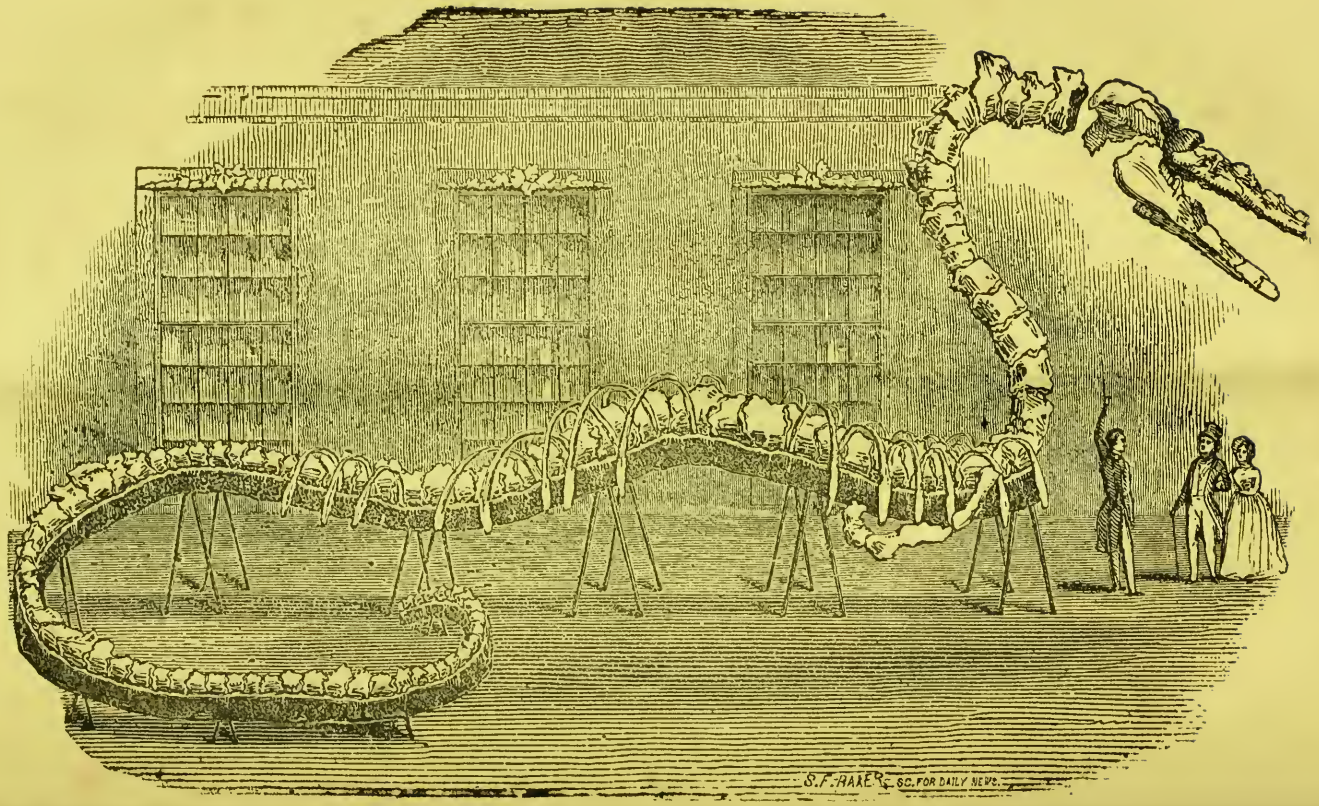
CONDUCTED

By a Committee of the Association.

CONTENTS.

1½ sheet, periodical—Postage, 2½ cents, to any distance within the Union.

NEINSTEDT, PRINTER, GETTYSBURG.


S.F. HAKER SC. FOR DAILY NEWS.

THE LITERARY

RECORD AND JOURNAL

OF THE LINNÆAN ASSOCIATION OF PENNSYLVANIA COLLEGE.

Vol. II. JANUARY, 1846. No. 3.

THE HYDRARCHOS, OR FOSSIL SEA SERPENT.

"Have you seen the monstrous sea-serpent at the Museum?"

"No, not yet."

"What! Is it possible, that you who take some interest in fossils, have not yet seen that astonishing curiosity?"

"I have heard it was a humbug."

"That is impossible: the merest tyro in comparative anatomy will observe, after a short inspection, that all these bones once belonged to the same or a similar animal, and that they fit precisely."

"On your recommendation, I'll go."

The above conversation took place between a sensible friend and myself, who is much better acquainted with fossils than I pretend to be.

I went to the place of exhibition and was amazed at the regular disposition of 106 separate bones into a serpentine form, the whole wound out into a length of 114 feet. In order to accommodate the immense animal in any room less than its length, it is necessary to convolute it, so that literally, its "course is not direct, but *serpentine*." It winds round the four sides of one large room, and the enormously long tail is run out into another. The accompanying cut is a good representation, though it conveys no idea of the amazing length of the skeleton. The bones of the neck and head are supported on iron frames or shelves, and those of the body and tail, on a narrow continuous stage or counter, upheld by trusses, as seen in the figure. The ribs are fixed on iron hoops, which are screwed to the counter for a support. There's nothing *beautiful* about the skeleton, as may well be supposed, and any collection of mere dry bones, on the commons or near a slaughter-house, would be as interesting to the uninitiated as this.

But, after all, what is this?—if genuine, you here see the remains of a serpent-like animal that some time ago inhabited that section of the globe which now constitutes the State of Alabama. "Some time ago?—

how long ago is that?" Ah! that is *the* question. It was doubtless before Adam was a father. I would not like to give a more definite answer.

Dr. Kock, an enthusiastic German geologist, is the fortunate discoverer of this unique fossil. He is the same gentleman who brought to light the immense mammoth skeleton, which he called the *Missourium*, which now graces the British Museum, and for which the British government gave him the handsome sum of $5,000. He found this serpentine skeleton in a small rocky prairie, in Washington Co., Ala., in a stratum of yellow limestone, mingled with a great number and variety of marine fossils. He was led to this discovery by observing a number of huge bones used in the vicinity for various purposes. He saw several used as andirons in a fire place, one as a door-sill, and one even as a pillow by a negro. This put him on the scent, and he did not cease his researches and labors, until he had exhumed an entire skeleton of this enormous reptile. He called it *Hydrarchos* (Water King) *Sillimani*, in honor of Prof. Silliman, but at the Professor's own suggestion, he changed it to *H. Harlani*, in honor of the late celebrated American Geologist and Naturalist, Dr. Harlan.

This relic is, without exception, the largest of all fossil skeletons ever found. Its length now is upwards of one hundred and fourteen feet, without estimating any space for the cartilage between the bones, and its length, when living, must have been over one hundred and thirty feet. Who knows but it is the great progenitor of the sea-serpent, that is said, to show himself occasionally on the coast of Massachusetts? This animal was probably a frequent visitor of large rivers and bays, on whose surface it sported with its head and neck elevated above the water seeking what it might devour. A whole shoal of herrings would hardly suffice for one meal, and a couple of the hugest alligators just served for a moderate lunch before dinner. It would seize the biggest of them across the back and hold the struggling monster with as much facility as a mole does an earth worm.

The eyes of the Hydarchos were situated in such a manner as to assist in seeking and catching its prey with more ease, for they were of the size of an ordinary dinner-plate and prominently placed on the forehead. The propelling motion of the animal, was like that of the serpent tribe: depending on the action of its powerful vertebrae and the strong muscles and ligaments acting in harmony with them. The strong and lengthy tail was used as a rudder to direct its course, as well as for the purpose of propelling. What an amazing power that tail must have had! With one sweep of it he could knock off the stoutest main mast

of a New Bedford whale ship like a pipe stem; he could mash into a jelly the most gigantic mammoth, who came down to the water to drink, with two or three blows. He could twist himself round the Great Wesern steamer and draw her down, engines, passengers and all! It is well there are no such animals existing at present, for navigation would be dangerous, whale oil would be dear, and all the smaller fishes scarce. Milton must have had him in view, when he described the snaky sorceress of sin at Hell's door:

"With head uplift above the wave, and eyes
That sparkling blazed: his other parts besides
Prone on the flood, extended long and large,
Lay floating many a rood; in bulk as huge
As whom the fables name, of monstrous size,
Titanian or earth born, that warred on Jove,
Briareus or Typhon, whom the den
By ancient Tarsus held; or that sea beast,
Leviathan, which God of all his works,
Created hugest that swim the ocean stream.
* * * * *
So stretched out huge in length the arch fiend lay."

J. G. M.

AN INTRODUCTION

TO THE NATURAL HISTORY OF LEPIDOPTEROUS INSECTS.

From the French of Boisduval.

The existence of Lepidopters in their perfect state is very brief in duration; the male perishes within a few days after copulation, and the female soon after she has laid her eggs. But some European *Vanessas*, and, as we suspect, many Heterocerata, exhibit in certain cases a very remarkable anomaly: they do not prepare for reproduction until within seven or eight months after the hatching of the perfect insect. Thus, for example, the *Vanessa antiopa*, *V. polychloros*, etc., living together in the larva state, and hatched in the summer, do not unite until the spring of the following year. The greater part continue to fly until the end of their existence, although some withdraw into the crevices of walls, hollow trees, vaults, caves, etc., and fall into a state of torpidity until the first pleasant days. Some authors have believed that it was late-hatched individuals that had been surprized by the arrival of severe weather, that fell into this state of lethargy; but it is not so, for we have had opportunities of seeing the *Vanessa polychloros* and *V. urticae*, in a profound torpor, in the month of August, when other individuals of the same species were flying about in the warm sunshine. This explains why *Vanessas* are found in the Spring so fresh, although

sometimes their colors have lost something of their vivacity by their hybernation.

Most Lepidopters take their food by pumping up, with their spiritrompe (or proboscis), the choicest juice of flowers, either during the day or after the setting of the sun. Those in which that organ exists only in a rudimentary state, as most of the Heterocerata, die without taking any nourishment. There are some species, such as the *Vanessas* and the *Apaturas* that prefer to the nectar of flowers the liquids secreted by the wounds of trees. Others feed upon the excrements of animals and even upon carrion. Sometimes during the heat of Summer we see certain species assembling in groups, more or less numerous, around the brinks of streams, or at pools in muddy roads, sucking the moist earth as if for the purpose of quenching their thirst; and finally, a great variety of the Nocturnals seek out the honey which, at certain seasons of the year, covers the leaves of many trees.

The female lays her eggs upon the plant by which her family is to be nourished. They ordinarily have a spheroidal or oblong form, and the shell is generally more or less fluted. When they are first laid they are covered with a gluey matter, insoluble in water, which serves to fix them upon the stalks or upon the leaves of plants. In the species which live together the female deposits all her eggs, or at least a large part of them, in the same place. Sometimes she covers them with hair from her abdomen in order to preserve them from cold and moisture, or she entirely conceals them under a white foamy substance. When the caterpillars are to live upon trees which lose their leaves in Autumn and the eggs must remain during the winter, the female, with wonderful providence, deposits them upon the trunk or upon the branches, which is sometimes done with remarkable symmetry; the *Bombyx neustria*, for instance, arranges hers with great skill along the branches in the form of rings or of spirals. In the species which deposit their eggs singly or in little groups of two or three, the female sometimes covers them up in a little bed of hair taken from her own body. Most of the Rhopalocerata, the Noctuelidae, the Sphingidae, the Geometrae, etc., deposit only one egg at a time, upon leaves or upon stalks.

The size of the egg, compared with that of the perfect insect, varies greatly according to the race to which it belongs. Those of the *Saturnia*, the *Sphinx*, the *Bombyx*, etc., are generally pretty large, whilst those of the *Zenzera aesculi*, and of the *Cossus ligniperda*, are very small. Their color is as various as that of birds' eggs; we see them of all shades, from a bright white to a deep black, and some are spotted with different colors.

The fecundity of Lepidopters is as variable as that of fish; some do not lay more than a hundred eggs, whilst others deposit many thousand. The Rhopalocerata are generally less prolific than the Heterocerata, and the most remarkable among the latter are the endophyte species, such as the *Sesia*, the *Hepialus*, the *Cossus*, &c.

The vital resistance of the eggs is very great; they can support a temperature of from 50 or 60 degrees R. to below zero, and the most excessive cold, without the destruction of the vital germ. They can be preserved by artificial cold for any length of time, and can be hatched by giving them a suitable degree of heat. The most vigorous winters of Siberia have no influence upon the eggs of Lepidopters peculiar to that region, nor even upon those of the *Bombyx mori* (silk-worm.) Those of a great many species in our climate hatch before winter, and the caterpillars pass that season in torpidity, or in the chrysalis state.

The shell of the egg is of a solid consistence and horny; at the moment of exclusion, the little caterpillar cuts the shell circularly with its jaws, in such a way that the top forms a kind of lid which it has only to raise in order to go out.

LARVA OF CICINDELA.

Walking in the woods last Autumn, I saw several boys intently leaning towards the ground, who seemed engaged in some rare sport, for now and then the woods would ring with a most uproarious laugh. I approached near and unobserved. I saw that they were inserting thin sticks or straws into the ground and suddenly pulling them out, to which something appeared attached, and it was this that occasioned the fun. I now joined them and soon found out the nature of their sport. All around in the earth there were circular holes about the diameter of a straw, and judging from the length of the sticks inserted, from eight to twelve inches deep. When the boys put down their straw and quickly drew it out, there would come out with it an ugly looking *worm* that had taken fast hold of it with its enormous jaws. It is a savage animal and its manners I will now describe. I had never seen it before, though I at once knew what it was.—A facetious English writer thus describes it: "Aspect, vicious; temper, ferocious; eyes infernal; jaws, diabolical; head, big; back, humped, the hump adorned with two hooks."

This is the *larva* of the beautiful *Cicindela*, or Tiger Beetle of Linné, which is very abundant in dry, sandy places. When you approach, they take wing with facility, but their flight is short and they usually return to the place they left. Several of the species in our

country are beautifully green with yellowish spots, and if, during their flight, the sun shines upon them, they present a dazzling appearance. They also run very rapidly on the ground, and are not easily taken with the hand. Linné designated them as tiger beetles, because they are exceedingly voracious and devour multitudes of other smaller insects.—This insect is interesting to entomologists from the fact that it was one of the first captures of Linné. During his tour to Lapland, before he studied insects, he was struck with the appearance of the *Cicindela* in the pine forests of Lycksele and captured some specimens. Although it is a very common insect, yet these original captures of the illustrious Swede were found in his cabinet after his death, and purchased by the Linnaean Society of London, when hundreds of the same species might have been taken in a few hours in the neighborhood of that city. But these belonged to Linné, and were caught by him, and that gives them an extraordinary value.

But it is of the *larva* (or caterpillar) of the insect that I am now to speak. It is about an inch long—composed of twelve transverse segments, besides the head and anal segment. The head and first segment which are wider than the rest, are black, hard, and crustaceous. The mandibles or jaws, are sharp, horny, long and bent upward. The eighth segment is much thicker and wider than the others, excepting the first. It has two fleshy tubercles above covered with rough and thick hairs, except a small circular spot in the middle. Each of these tubercles is furnished with a spine or horny hook, crooked and sharp, of which the point is directed outward and toward the heads. The larva can elevate or depress the tubercle and hook in an instant. It is not necessary to specify the animal more distinctly. What are its habits? It excavates this deep hole in the loose sand, and then crawls to the top, hanging to the walls by its hooks. But it does not come altogether out; it just peeps out, as it were, the orifice exactly fitting the size of the head, and there it hangs, with its enormous jaws distended, and woe to any ant, spider or other insect not too large, that dares to venture too near. It seizes them ferociously, draws them down to the bottom, sucks their juices, carries up the remains to the surface and throws them away. It is a regular robber in ambush, pouncing on his unsuspecting prey. It is equally voracious with the ant lion, equally ugly, and equally ingenious. The ant lion digs a funnel-shaped hole and watches at the bottom, but our larva bores a cylindrical one, and lies in wait at the top with nothing but his ugly head visible.

In its legs and other parts of its body it has a mattock, spade, wheelbarrow and every other instrument necessary for excavating the earth.

You can see it dig, if you capture one, and give it some sand to work on. After having removed some with the fore feet, it seizes it with the jaws, places it on its head, of which the upper surface is hollowed out, and then carries it to some distance from the hole which it has begun. In this way it labors until the hole is deep enough to conceal the whole body and then its operations become more interesting. Descending head foremost, and crooking its anal segment over the opening of the hole to support the body, it continues the work. From time to time it carries on its head the bits of sand it has detached with the feet and jaws and holds them there by means of the jaws, which it elevates, and by the position it gives to the head, throwing it back so as to form a right angle with the body. In this way it carries grains of sand and small stones larger than the head, and if one of these falls, it seizes it again with the mouth and throws it over the head to a considerable distance from the hole. As the hole deepens, the labor of the miner increases at such a rate, that he is often forced to rest in regaining the mouth of his mine; to effect this he fixes himself to the sides by means of the hooks on his back. He is like a chimney sweep, who supports himself in the flue with his knees and his back, only that the sweep has the additional advantage of hands, but he is not a better climber than our larva.

At the slightest approach of danger, he descends with great rapidity, letting himself glide down to the bottom. The tubercles on the eighth segment are depressed in an instant and thus offer no obstruction to his descent.

After he has finished his hole, which varies in depth according to the age and size of the larva, he establishes himself at the entrance. As before stated, he pokes out nothing but his head and the first segment and sustains this position by means of the hooks on his back. He seizes on every thing within his reach, and even devours the *perfect* cicindela, which may have been his own mother.

When full fed, he retires to the bottom of his artificial cave, assumes the chrysalis state, and some time after comes out the beautiful beetle before described. We have about twenty-four species in this country, but the habits of the *larvae* of all are probably the same.

J. G. M.

LIGHT.

The knowledge, which has been obtained in reference to that subtle something—light, and the laws which govern its motion, reflection and

transmission, are well calculated to excite astonishment in those who do not know by what means these results have been obtained.

For a long time the question, What is the physical nature of light? has occupied the attention of the most profoundly skilled and patiently laborious investigators of the laws of creation, and with all the information that has been elicited, no one perhaps would hazard the assertion that it is even now decided.

The first question which presents itself in reflecting upon the nature of light is, in what manner is the perception of external objects produced? It is well known that between the organs of vision and some visible objects, spaces intervene which, when compared with the small terrestrial magnitudes to which we are accustomed, may be considered as infinite, and yet, by some means, a connection is formed between the organ and the object, so that a distinct impression or sight is produced.

To account for this wonderful fact, two theories have been devised, both of which have become celebrated from the distinguished names which have been found in the lists of their advocates, and which are known as the corpuscular and undulatory theories.

The first theory supposes that light is material, that the luminous body actually emits material particles which, far more minute than any thing of which we can conceive, fly with a velocity almost infinite, and impinging upon the delicate nervous net-work of the eye, produce the impression which is called sight.

The undulatory theory, on the contrary, denies the materiality of light, and explains the effect by the supposition that an exceedingly subtle, imponderable, etherial fluid pervades the universe, and that vibrations are excited in this luminiferous ether, as it has been called, which extend with immense rapidity in every direction, and produce the sensation of sight. Amongst the supporters of this latter theory are found the names of Huygens and most of the continental philosophers.

That the transmission of light is not instantaneous, but that a definite and measureable interval of time is required in passing through a given portion of space, has not only been proved, but its exact velocity has been measured. For this wonderful discovery the world is indebted to Roemer, an eminent Danish Astronomer, to whom it was accidentally presented whilst engaged in an investigation of little importance when compared with the treasure of truth to which it led. A series of observations on the eclipses of Jupiter's satellites furnished Roemer the necessary data, from which to calculate the periods of their revolution and to predict, with a prospect of certainty, the return of each successive disappearance. To his surprise he found a discrepancy between the results

of observation and calculation, and he soon discovered that the error was always between certain limits and depended upon the distance of the planet from the earth. These facts were inexplicable on the supposition that the transmission of light was instantaneous, but the phenomenon was fully explained by allowing $16\frac{1}{2}$ minutes as the time required by light to traverse the earth's orbit. Its velocity therefore was determined to be 200,000 miles per second.

Did the particles of light possess the ponderable properties of matter even in the most minute degree, their immense velocity would give them a momentum so great that nothing could withstand their force; the delicate mechanism of the eye would be infallibly destroyed, and even those bodies, which were capable of opposing the greatest resistance, would, by the long continued action of such power, be subjected to decomposing influences far greater than any others which nature furnishes. If, for example, a single molecule of light be supposed to weigh one grain, its momentum would equal that of a ball weighing 300 pounds, and moving at the rate of 150 miles per hour. Since, then, the infinite number of molecules that enter the eye in a single second do not by their united influence produce any injury to its exquisitely delicate structure, it becomes difficult to resist the conclusion that light must be absolutely imponderable, and consequently devoid of one of the ordinary properties of matter.

The undulatory theory does not suppose any actual transmission of particles, but only a rapid vibration of the luminiferous ether by which motion is propagated without any progressive movement in the particles, in the same manner as sound is produced by the vibrations of the atmosphere.

Not content with the discovery of the velocity of light, philosophers next turned their attention to the measurement of the rapidity of the undulations and the amplitudes and altitudes of the luminous waves, and for the solution of this refined problem we are indebted to Newton himself. Having placed a slightly convex lens in contact with a pane of glass, and allowed a beam of decomposed light from a prism to fall exactly upon the centre, he observed that luminous concentric rings were produced of such dimensions as to be susceptible of measurement, and their diameters, with that of the sphere of which the lens was a part, gave the requisite data from which to calculate the distances between the glass surfaces. From these calculations he found that if the distance at the first ring was represented by 1, at the second it would be 2, at the third 3, &c. These distances he supposed to correspond to the amplitude of the luminous waves; that at the first ring the space

between the surfaces was sufficient for one wave, at the second for two, &c. From these calculations it appeared that the waves of red light were so minute that 40,000 of them would be comprised within an inch, and that 60,000 violet waves were included in the same space; the waves of other colors being of intermediate magnitudes.

From these results it is inferred that lights are of various hues according to the amplitude of the pulsations, exactly as musical tones vary with the magnitude of the aerial vibrations, and as the altitude of the sonorous undulations determines the loudness of the tones, so the altitude of those of light determines the intensity of the color. A singular analogy is thus exhibted between the laws of transmission of light and sound.

Another curious result is obtained from data which these considerations furnish us. As sounds are produced by vibrations communicated to the tympanum by means of the air, the number of which in a given time is susceptible of calculation, so the sensation of sight may be considered, in accordance with the undulatory theory, to be produced by vibrations communicated to the membrane of the eye, the rapidity of whose contracting can be thus determined.

Since light travels at the rate of 200,000 miles in a second, a line of light 200,000 miles in length must enter the eye during this interval; this length is equivalent in round numbers to 12,000,000 of inches, which, multiplied by 60.000 for the violet rays, would give for the number of vibrations of the retina, during a single second, more than some hundred millions of millions.

In meditating upon these celebrated theories, we are forcibly reminded of the insignificance of all human attainments when compared with the vast resources of knowledge which lie hidden from our view. We have seen that the patient, long continued labors of individuals, have sometimes snatched a single jewel from the treasury of Nature's truths to adorn their names with immortal honor; but how small is this in comparison with what remains unknown. On every side we experience difficulties, and the more deeply we penetrate into the mysteries of nature the more we are enabled to perceive that the limit of knowledge is unattainable, and that eternity itself would be too short to enable man to become acquainted with all the works of the Creator or to comprehend his glorious attributes.

Whichever theory be taken, difficulties still remain; if light be material and possessed of the ordinary properties of matter, it would seem that it must exert an influence upon the heavenly bodies, forming, in fact, a resisting medium, and however slight the resistance might be,

even if myriads of ages were required to produce a perceptible effect, still this would be sufficient to destroy the perpetuity of the system, and a time might be conceived when the diminished orbits of the planets would bring them in contact with the sun, unless the impulsive power of the rays or some unknown cause should produce a compensation.—This difficulty, so far from being diminished, would appear to be increased by the supposition that there exists a luminiferous medium, to whose vibrations the sensation of sight is due; for if this be supposed to be material, a like resistance would be offered, unless, which is contrary to all analogy, its particles be supposed capable of passing as freely through the dense substance of the planets as through the otherwise unoccupied parts of space. H. H.

THE NATURALISTS' CLUB. NO. II.

In the month of November, 1845, two of the characters, who took part in the proceedings, of which an account may be found in the number of the Literary Record and Journal of the then current month, might have been seen in a front room above stairs in York, Pennsylvania. The room had book-cases and writing-desks upon two sides: large breeding-cases occupied another: a cabinet filled an angle, which very properly did not appertain to the external wall; and upon the walls were suspended forceps, nets, a portrait of Linnaeus, and a *Meerschaum*, with a scarlet bag suspended from the same nail, and lettered in black cabalistic characters—Rauchtabak. A closet near the fireplace was filled with boxes which, judging from a number of the same kind lying upon a table in no little confusion, contained duplicate insects, from which some one appeared to have transferred a considerable number into a box two inches deep, five wide, and nine long, of German manufacture; being made of bits of pasteboard glued together and covered with a fragment of copy-book, bearing glyphiks of the higher order, *id est*, hieroglyphiks, in Teutonic chirography.

The gentleman, who seemed the host, had just received the Literary Record of Pennsylvania College, and glancing over the table of contents upon the cover, turned to the article whose title he liked best, and read it with great pleasure, whilst his visitor was examining a drawer of Staphylinidæ. So pleased was he, that he communicated his satisfaction to his friend, at the same time leaping up and throwing the periodical towards him that he might judge for himself. Unfortunately he forgot the proverb, "*look* before you leap," and *das Büchlein* made a "fell swoop" upon the Brachelytra, decapitating a much prized Oxypòrus in

its descent. This gave a sudden check to our host's hilarity, and as he proceeded to ascertain and repair the damage, his visitor took the Journal, glanced in *his* turn at the contents, and commenced reading, as he supposed, the article which had pleased his host so much; but whether he agreed with him or not could not be at once determined. Occasionally he seemed to discover an error; at least he appeared ill at ease, knitting his brows, and fidgetting in his chair; until finally he threw the Journal upon the table with some emphasis. PAGANUS, having finished his task, broke silence by remarking—"That is an excellent account, is it not?"

ENTOMOPHILUS. Excellent? I never read such nonsense in my life!

P. You surprise me! I wonder at your speaking so freely of the science of an author, whom you know to be so much delighted, when his entomological lucubrations gain your approbation.

E. And you call this *science* do you? Talking about "their little *bark*."

P. Yes, little *bark beetles*. Why if you object to calling it science, I admit that it is not as deeply scientific as it is interesting. The author has produced a useful essay in a branch of practical entomology.

E. Well, if his "practical entomology" takes no higher stand than catching bugs on a chip alongside of what he calls the bark, I want none of it. Who can it be? I don't recognise his style.

P. But at least you know his initials, and must remember the verbal account he had previously given us of the *Apate basillaris*.

E. Of course I remember that, but can't perceive the connexion between that insect and this stuff about kingfishers, and snake's eggs.

P. I admit that he rambles a little towards the end, where he draws a picture of the devastation made by hungry insects in the forest.

E. *Insects* in the forest? You surely mean his picture of hungry entomologists at the table; but the accident to your drawer of specimens has shut everything but insects out of your head.

P. I mean what I say, but excuse me, I fear you have paid but little attention to the article, or you would not say there was any allusion to kingfisher's eggs in it. I have an idea that you have been reading yourself half asleep, and have dreamt about our row across the Susquehanna. At any rate, had you been wide awake, you would not have failed to recognise the ready pen of our friend URBANUS, independently of his signature.

E. I observed no signature, but you are certainly in error, because *he* rowed—

P. Rode? Where did he ride?

E. *You* at this trifling too! I really expected something better from you. ENCYCLOPEDIANUS must have infected you with his detestable Philadelphia habit of punning.

P. (A habit which would not become me.) I beg your pardon my dear Entomophilus, but I am really not aware that I ever made a pun in my life.

E. There is no use in denying it. You have been *trying* all day, but I pretended not to notice it. I have a perfect recollection of your first effort in this downward career. It was during our row across the Susquehanna, when ORNITHOPHILUS told us of his shooting exploit, which you termed *fowl* shooting.

P. (Can it be possible that *that* was a pun.)

E. I intended to state that Urbanus couldn't be the author, because the boat was rowed by him, and considering his trouble, he could hardly have called those stiff clumsy things "the yielding oars," as the article in question has it.

P. I remember no allusion to rocks or ores.

E. Worse and worse! If I had my horse here I would go home.

P. Speaking of horses, can you tell me what the French mean by *hors de combat?* Probably a war horse. So you really think but little of the entomological article in the Record and Journal?

E. Since you have commenced punning, I don't wonder that *you* admire it; but permit a friend to tell you, that those who give way to such tastes need not expect to make a figure in the scientific world. A man might almost as well take to punsh as to puns. There is little difference between them. And then, to have one's conversation copied out verbatim, what will the readers of the Journal say, those readers before whom we have passed for philosophers. What will they think when they find that when alone, *we* laugh and talk like other people! Sorry as I am to find so little dignity among our companions, I have still stronger regrets, when I see such foibles exposed in print. If these things continue, we will be as bad as the English, who wish the world to know all about them, whether good or bad.

P. The jokes of Urbanus appear to have prejudiced you against his essay upon the ravages of *Apate basillaris*, which you have just been reading.

E. Where? I know nothing about it.

P. A few minutes ago I asked your opinion on it, and you have been attacking it on all sides till now.

E. We have misunderstood each other: *I* was alluding to the article detailing an adventure of the Naturalists' Club! HESPERUS.

THE RATTLE-SNAKE. (*Crotalus horridus.*)

Last Summer, through the generosity of one of our friends, the Linnaean Cabinet had added to its curiosities, the present of a *live* rattle-snake. Of course, there was not a little stir at the reception of so important a personage. Many visitors, after having been well assured that the cage was strong, the wire grating well nailed down, and no danger to be apprehended, paid their respects to his snakeship; so that in a short time he became quite a "lion." He, very naturally, entertained them in his own particular way, and, we suppose, the poor fellow never found so much use for his rattles in all his previous life.

A wish has been expressed by some, to know "how we fed him"—"how he took his food"—"were we not afraid of him, the nasty thing!" &c. It is with the design of furnishing such information as we are able in reference to these queries, that this communication is written. Previous to this, we never had the honor of serving in the capacity of feeder, &c., to any other animal of importance, except ourself; and, therefore, allowance must be made for any departures from the method "laid down in the books."

After the lapse of a few weeks, a young ground-squirrel, more dead than alive, was put into the cage and pushed along by means of a wire towards our captive, which in the mean time kept up an incessant rattling. The little animal did not appear to relish this much, and struggled, though ineffectually, to escape. The attention of the snake did not at first seem directed towards his trembling prey, but as it was brought nearer, raising his head a few inches from the midst of his coil, he turned that way; and when within a half-foot, with the suddenness of thought, he struck it across the middle of the body. The squirrel squeaked and sprang upon the coil of the snake, which was now perfectly quiet, sat there about a minute, and then fell over. The snake lay perfectly still for some time; and naught but his small black eyes, which had lost their usual dullness and now glistened brightly, gave any evidence that he was at all concerned in what was going on. By and by, he slowly and silently began to uncoil and move towards the squirrel, at the head of which he stopped. He then opened his huge jaws and laying them round the head, commenced the process of swallowing. Scarcely, however, had he done so, when alarmed either by a convulsive movement of the squirrel or by some noise in the room, he suddenly threw it some distance from him. But he was not thus to be robbed of his meal; and, approaching it again, after having beslimed it somewhat by darting out his wiry tongue all over it, he commenced afresh. In going through the process, he contorted his body in the

most singular manner; sometimes drawing out his whole length, then doubling himself he appeared to be forcing the muscles of his body towards the neck and head with a vermicular motion, as if to give those parts more power. He had nearly swallowed his meal, when the cage was slightly moved. Instantly he began to twist himself about in so complicated a manner, that we scarcely knew what was coming next, when, with a sudden effort, he ejected the squirrel, throwing it far from him. We now left him to himself; and, on returning in about an hour, found that he had made the work sure this time, and lay coiled up, soberly enjoying his repast with perfect *gusto*.

In about two weeks, the anxiety of some friend "to see the snake eat," induced us to tempt his appetite again, though with little hope of success. This time a squirrel, larger and more lively than the other, was put into the cage; but the snake took no notice of it. Nay, we pushed them together and over each other, but, with the exception of some slight manifestations of dislike of such treatment, he would not touch it. One thing of interest occurred during this experiment: The little creature had crouched in one corner, with its head buried behind a tuft of hay, near the snake, which lay coiled up, rattling with might and main. By means of a wire we pressed down the hay, and, as soon as the eye of the squirrel became visible, the snake stopped his rattles and reared his head. Then, with that slow, steady movement, which always created the feeling that a life was to be lost the next instant, he approached it; but had no sooner touched the head than he drew back suddenly, and commenced his music over again. The squirrel was left in the cage all night, and next morning was found dead, whether from being bitten or from some bruises it had received in being captured, we could not say.

In the course of the Fall, at the suggestion of a scientific friend, it was determined to try the effect of Ash-leaves upon him. If we mistake not, Heckwelder relates the success of such experiments among the Indians; but although we showered leaves and branches, (we used the white-ash,) quite abundantly upon him, the spell would not work. One of the party indeed thought the rattles were not quite so loud, but we suppose, the same effect would have followed had he been *buried* in any other kind of leaves. Music, too, was tried, but this time Shakspeare proved untrue; and the savage beast was not charmed. A few weeks after, a small land-tortoise was thrown into the cage at evening, and next morning was nowhere to be seen. As there was no getting out, we easily concluded what had become of it.

An account of our last attempt at feeding him may prove interesting

enough, from its singularity. Cold weather had commenced, and he lay torpid and flattened out as if his skin were all that was remaining of him; but, upon being brought into a warm room, he soon recovered his activity and rotundity. A young chick was introduced, and, for a time, occupied itself in picking up some small grains that lay upon the bottom of the cage. By degrees it approached nearer and nearer, and at last, very deliberately stepped upon his coils. The snake crept quietly away, very much to the astonishment, not only of ourselves, but of the chicken, for it eyed its black perch moving off from beneath it with such a serio-comical air, that we could not repress a hearty laugh. But this was not all. The chick followed up, and trod all over his majesty, whose bile now evidently began to rise, for his eyes brightened and he twitched away with a sudden movement. They were soon brought together again, when insulted dignity, after bearing a great deal, could no longer brook being trampled upon, and he fastened his fangs in the chicken's neck. It had been making some noise before, in its anxiety to get out, but, upon this, became entirely quiet and walked to the other end of the cage. Evidently, if it reasoned at all in the matter, it seemed altogether perplexed to account for the peculiar sensation in its neck, for although the wound did not prove mortal, it gave evidence of its existence by an occasional uneasy twitching, and a very grave deportment. Cuvier says, that the intensity of the venom is proportioned to the warmth of the season; and, as it was now late in the Fall, this may account for the failure of the poison's doing its usual work. In about half an hour, the effects seemed to have disappeared; and again the same scenes ensued; the snake, either through intimidation or an indisposition to strike, appearing to avoid a contact. At one time, whilst he was moving from one end of the cage to the other, where stood the chicken, it watched its movements closely, and, as he approached, lowering its head, ran forward and pecked at his eyes. We caught ourselves saying, "what a fool!" But the snake, at length, would no longer submit to such aggressions, and, upon a repetition of them, struck at the chicken, but without effect, as it was the thick feathery part of the wing he touched. Another effort proved more successful, and the poor chick struggled for some time before it released its head from the monster's jaws. The snake appeared to feel that he had settled the matter now, for, after having opened his horrid mouth to its full extent, as if to get all right again, he quietly coiled himself away in one corner. But he was mistaken, for although the chicken became quite weak, it survived a full half hour; when we put an end to its misery and the scene at once. The snake would not touch it afterwards.

We intended to make a few suggestions, and draw some inferences; but, as "the facts" are before readers as intelligent and acute, and, we hope, vastly more so than ourselves, we will permit them to do it for themselves; only remarking, that if our hero be a fair representative of his race, we have learned to fear rattle-snakes less, and respect them more. * * * * * * W.

TIME.

"Now, *is the constant syllable ticking from the clock of time.*

Now, *is the watchword of the wise.* Now *is on the banner of the prudent.*

Cherish thy to-day and prize it well, or ever it be gulfed into the past.

Husband it, for who can promise if it shall have a morrow?"

TUPPER.

Time! what kind of stuff is it made of? Moments, which glide away like the bubbles that float on the rapid stream. To-morrow is not; and yesterday, like foot-prints on the shore, is obliterated by the waves of eternity. Time, then, is to-day, now, whilst I write and mind is busied with its own imaginings. Time has been personified; an aged man, with scythe and hour-glass, and head all bald, save a single tuft on his forehead. With this representation we would not quarrel. The sands of that glass do truly tell how noiselessly and ceaselessly the stream of life is flowing away. That scythe too surely indicates the certainty and the cruelty of the destruction with which he cuts down our dearest hopes; and that bald head and naked form teach most clearly, that when he is past he can no more be seized and his progress arrested, and that the only hope, which the child of indolence can have of delaying his progress, is to lay hold of his fore-lock and hold him with an unbroken grasp. Old is he too; the first-born of earth. When this ponderous ball, on which we tread first began to move on its axis and to perform its annual revolutions around the sun, then time began to live, and, with the sons of God, shouted for joy and sang in chorus the praises of the great I AM. Much has this old man seen in closet and chamber, in the wilderness and the city, on the sea and the land; and much will he have to say at the last great day, when summoned to testify concerning the deeds of men. Who would not now desire to peep into that note-book to see those pencilings by the way, which now have grown into huge folios? Calm thy curiosity child of clay. Look into thine own heart and thine own history and thou shalt learn much.—Time is a revealer of secrets. We will not pry into our neigh-

bor's history to seek for blemishes, which, alas, are revealed too soon. We will not be overwise to judge the actions of our fellow beings, scrutinizing them with an evil eye. We will wait with trembling until time shall unclasp the ponderous tome of life, in which are kept the records alike of the actions of the criminal and the judge, the peasant and the prince. Then will hearts beat high with emotion, and eyes beam with interest and weep with shame, and cheeks become pale and blush as the forgotten past step by step is retraced. Alas! who can abide the day, when the secrets of all hearts shall be revealed, and the depraved soul shall appear in all her naked deformity? May time find us, gentle reader, on that day clothed in the robes of our Saviour's sufficiency. Time is old, but has lost none of his vigor. Our frailties and infirmities increasing upon us every day, do but give evidence that his power is undiminished. Yea, rather are they the tokens of increasing strength. Before the time when Jehovah broke up the fountains of the great deep and opened the windows of heaven, his power was paralized.—Then was the infant an hundred years old and the hoary sire laughed at time's threatenings. But now how changed. He knocks at the door, as each successive year returns, to summon us to reflection, and we tremble. He touches the raven locks and they become white as wool; the eye, and it is dimmed and hollow; the cheek, and its roses fade and its fullness falls into wrinkles; the body, and it stoops and totters, the limbs, with difficulty and pain, dragging it along, until, in a few years, the grave has triumphed over it and the worm has fed and rioted on its members.

Oh man! thy time is short; and rapid as short. The moments haste, like swift messengers, to the Judge of all to bear their testimony. Can we not burden them with benefits to our fellow-men and glory to our God? *To-day* thou hast in thy possession. Then improve it. Let it not run to waste in vain resolutions and idle day-dreams, which dishonor the soul and mock high Heaven. To-morrow, if it come at all, will be too late to discharge the duties of to-day. To-day has its own peculiar work. Yet how we love to escape from the burden of to-day and let it fall on the uncertainty of to-morrow. The youth defers to manhood, and manhood to old age, and old age to the last hours of mortality, the most important duty of life. The pen of the prophet, guided by the Spirit of God, writes "*to-day* if ye will hear my voice." The fool saith to-morrow, hears not the voice of mercy and dies. The golden moments of youth, the seed-time of life, are thus permitted to run to waste, and the mind, like a fertile but neglected garden, is choked with the luxuriant growth of noxious weeds. It is a sore evil to the

flesh to task the mind, and tax all its powers to their utmost and draw forth its latent energies. 'Tis thus the man is made. 'Tis thus influence is gained, the state is ruled, disease expelled the system, and the blessed words of life made energetic, by the Spirit's power, to save the soul. Who can measure the extent of that power for good, which the mind, thoroughly educated and imbued with the spirit of the great Master, exerts upon his fellows? And yet the young man will fritter away his precious life in idle gossip, and dream over the silly tales of romancers, and sleep away the morning of life and refuse to inure his mind, as the Roman soldier did his body, to hardships; and when the labors of manhood come upon him, and he is summoned to conflict, too late does he discover that he is a pigmy, and, if he would do service, must borrow strength from his neighbor. Shame on the man who thus dishonors his Maker. Would'st thou escape the shame? Then improve today. Make every hour tell on its appropriate work. Sow thy precious seed in youth broad-cast and free. In manhood shalt thou reap a plentiful harvest, and in old age shall thy garners be full. Then wilt thou be carried to thy grave laden with honors, and, when the great angel, standing with one foot on earth and the other on the sea, shall swear that "time shall be no more," thou shalt be received into the glorious rest of God's people.

GRECIAN EDUCATION, NO. IV.

To give any thing like completeness to our account of classic education, particularly amongst the Greeks, it will be necessary to bring before the view another most eminent philosopher and instructor, Pythagoras, the founder of the Italic school, as Thales was of the Ionic.—These two sages were the sources of the various sects of philosophy. The birth place of this great man was Samos, and the first field of his operations, after he had enlarged and enriched his mind by knowledge obtained in foreign travel, was his native country. He did not, however, remain there permanently, but went to Magna Græcia, and established a school at Crotona. It is stated in Eschenburg, "that his pupils, whose numbers soon amounted to six hundred, dwelt in one public building and held their property in common. The business for each day was very regularly planned. They were divided into two classes, probationers and initiated; the latter only were admitted to all the privileges of the order, and made acquainted with its highest knowledge. This establishment was at length broken up by popular violence. Under phil-

osophy, the Italic school, like the Ionic included every object of human knowledge.

But Pythagoras considered music and astronomy of special value. He is supposed to have had some very correct views of astronomy, agreeing with the Copernican system. The beautiful fancy of the music of the spheres is attributed to him. The planets, striking on the ether through which they pass, must produce a sound; this must vary according to their different magnitudes, velocities and relative distances; these differences were all adjusted with perfect, regulated and exact proportions, so that the movements of the bodies produced the richest tones of harmony, not heard, however, by mortal ears.

One of his distinguishing peculiarities was the doctrine of Emanations: God is the soul of the Universe, pervading all things, incorporeal; from him emanated four different degrees of intelligence: inferior gods, demons, heroes and men. Another was the doctrine of the Metempsychosis, or transmigration of souls."

Pythagoras was well qualified by his attainments for exerting an influence upon his fellow men He did not undertake their instruction without the most ample preparation. With a mind of the most exalted order, disciplined by the most careful study, he was fitted to be the founder of a school, which, if it accomplished less than it might, was nevertheless deserving of high admiration. Pythagoras was eminent in various branches of science. His additions to Mathematics are well known. The notation table is ascribed to him. That most useful proposition in Geometry, the 47th of the 1st book of Euclid, claims him as its author. He was well versed in Astronomy, Medicine, Music, and various species of secret learning. Some of his leading principles, as presented by Schwartz in his Geschichte der Erziehung, are Harmony is the end in every thing. It is the world—the world therefore κοσμος, and it should be in men; therefore they are the μικρο-κοσμος. The harmony of the spheres is echoed in the cultivated mind. To this we are led by purification of the soul, (καθαρσις,) by self-knowledge, (γνωθι σαυτον) and devotion. Man enters into communion with God (ομιλειν τω θεω,) and obtains the highest happiness, when he comes to the clear perception of real relations, of the admirable order and celestial beauty. Purification is effected by a rigid life, under prescribed regulations, and requires both contemplation and action.

Sensual desire (ηδονη) pollutes, leads from one lust to another, and plunges into the miseries of violent passions. The soul of man is purified by migrating through many bodies, and then becomes prepared for a more exalted state of existence. Self-knowledge consists not exclu-

sively in a proper estimate of our endowments and deficiencies, but in a more profound inspection of our minds, and a testing of them in relation to the eternal fitness of things (Wohlordnung). He alone can do this, who has made himself acquainted with the order of the world.

Modesty is the necessary result of this, therefore no man should consider himself wise—σοφος—for wisdom is in God alone, and man can attain nothing more than the love of wisdom and should aim to become φιλοσοφος. A true philosopher is one who reflects on God and the world, the source and nature of things, the arrangements of the world, and the *Summum Bonum*, a Supreme Good. Every thing good comes from God, whose presence is universal, and whose power arranges all things.

The will of God must be sought by men; sometimes by oracles, (μαντικη). Whatever is pleasing to God they should do, and aim to resemble him in truth and moral purity, and seek to approximate more and more nearly to him.

To this we are brought by prayer, by doing good, and finally by death. God's administration is the model of man's, both civil and domestic. Internal dissention is worse than fire and sword, and anarchy worst of all. As God observes all our actions, and nothing is too minute for his inspection, we should be carefully observant of every thing connected with our own deportment, or subjected to our direction. Man being a ζωον υβριστικον, prone to irregularities, he needs guidance and control by means of legal enactments and the processes of education. Legislative justice is more important than punitive, for to it is committed the task of making such arrangements, suited to man's constitution, as will open the way for the voluntary prosecution of a career, which will result in the harmony—that musical pitch, which is the universal right and becoming.

The study of this man, so far as he is made known to us by the transmitted records of what he was and what he did, will lead to the conviction that he was far in advance of his predecessors in qualifications for the intellectual and moral training of men. Whom, after him, shall we find his equal? May we not think that he had a peculiar call to the glorious work of instruction, and was he not, all things considered, most admirably fitted for it? He rose above the great legislator of Sparta. His views of education were much more enlarged. He had more deeply pondered the subject. His range of operation was much more extensive, and he brought into action man's powers much more extensively. As the young are more particularly interested in our disquisitions, they may not be unwilling to receive some facts gleaned from

the pages of Diogenes Laertius, that very industrious collector in regard to this distingished man.

The entire biography of Pythagoras, as given by him, is very attractive. Says Diogenes: Life he compared to the assemblage of people at a festival. Some came to engage in the contests, others for trade, the better sort as spectators; so in life, some are addicted to glory and gain, and others (philosophers) to the pursuit of truth. Drunkenness he called, substituting one word for another, destruction. He disapproved strongly of all excess, and recommended temperance both in eating and drinking.

He never inflicted punishment, either upon a servant or a freeman, in a passion.

It is said, he advised his disciples to inquire carefully, when they returned home,

πη παρεβην τι δε ερεξα; τι μοι δεον ουκ ετελεσθη.

Advice, than which he could give none better to his pupils, and breathing the spirit of a higher dispensation than he enjoyed.

METEOROLOGY. *The year* 1845.

As the last month of the year, which has just been brought to a close, presented a character somewhat unusual, it may be well to put the facts on record for future reference, and at the same time to take a general view of the whole year. This course is the more important, as we are liable to make a very incorrect comparison of the weather of one period with that of another, if we depend upon memory alone. We, for instance, very frequently hear persons assert that the then present weather is the coldest or the hottest, the driest or wettest season that has been known for the last twenty, thirty, or forty years; whereas a reference to authentic records, in most of instances, will show that the case is not at all as stated. The past, with its inconveniences and its enjoyments, fades rapidly from our memory, and, feeling the weight of present difficulties, or tasting the sweetness of present pleasures, we are apt to exaggerate, unintentionally though it be, and to represent that which is just before us as either better or worse, as the case may be, than any thing of a similar kind, which we have experienced for years gone by. It is therefore, that it is important to have recourse to the records of instrumental observations, if we desire our information concerning the various conditions of the weather to be accurate.

Our recorded observations extend backward only a fraction more

than seven years, and consequently our comparisons must be confined within that period.

1. The month of December, 1845, was remarkable for the severity of its cold. On the first day, there was a fall of snow of the depth of nine inches, and, at various other times, during the progress of the month, there were others, which increased the total amount to twenty-three inches and a half. From the very commencement, the temperature was greatly reduced, and it continued so with but little abatement to the close of the month. On the night of the 6th, the thermometer had sunk to –7°, and on that of the 12th to –4°. Although the thermometer has been frequently known to sink lower at this place, it having been even as low as –22° on the morning of the 5th of January, 1835, we have never before known it to sink below 0°, in December. The mean temperature of the whole month, as will be seen below, has been less than that of any month for the last seven years except that of January 1840, and the nearest approach to it during any *corresponding* month, as far as our knowledge extends, was that of December 1838.

	1838	1839	1840	1841	1842	1843	1844	1845
Jan.	"	25.588°	21.839°	27.193°	32.072°	33.572°	24.685°	34.50°
Feb.	"	31.536	36.146	27.117	33.919	24.044	27.386	31.53
March	"	39.713	43.279	38.613	44.673	26.976	37.242	39.49
"	"	"	"	"	"	"	"	"
Dec.	26.232	31.584	27.092	34.019	30.516	31.360	32.380	22.20

The great cold, which thus prevailed at the close, stands strongly contrasted with the temperature of nearly the whole of the year which preceded it. January was unusually mild, and although February was somewhat colder, the thermometer never during that month sank below 9.5°, December being therefore much the coldest month during the year. As the season advanced, the weather continued to grow warmer, notwithstanding the occasional occurrence of cool days and severe frosts as late as in June, until July, which was the warmest month that has occurred for at least seven years past. The nearest approach to it was that of July, 1844, as shown by the following mean height of the thermometer:

	1839	1840	1841	1842	1843	1844	1845
July	71.37°	71.95°	72.36°	72.68°	72.27°	74.40°	74.86°

On eleven days the thermometer rose to above 90° in the shade and free from radiation and reflection, the highest being 96°. In consequence of the great dryness of the earth and air, the thermometer sank so slowly at night, that it frequently remained as high as 89° and 90°, at 9 o'clock P. M., in well aired chambers. And here it may be proper to remark,

that dry weather, during Summer, is also in general very warm and oppressive, for want of the cooling influence of evaporation and vice versa, moist Summers are generally cool.

The severity of the weather, therefore, at the close of the year, seems to have been but a compensation for the unusual warmth, which had prevailed over nearly the whole of the preceding portion, so that a mean temperature of 51.5° resulted, which is not more than a degree higher than the mean temperature of the preceding six years. Another law of the weather here presents itself to us, viz: that extremes of cold or heat, or of any other kind of weather, are, in the course of several months, compensated by the prevalence of an opposite condition of atmosphere, so that a mean result is at length produced. This is one of those beautiful and wise arrangements of the Creator, which are to be found in every part of the physical world.

2. The past year was also more than usually deficient in moisture, as will be seen by a reference to the following table; the mean or average for the last seven years being 37.206 inches, whilst the quantity for 1845 was only 30.19 inches:

	1839	1840	1841	1842	1843	1844	1845	*Mean.*
Inches,	38.012	31.771	45.434	36.238	47.631	31.167	30.19	37.206

When it is stated that the moisture deposited during the year is so many inches, the meaning is, that if all the rain and all the snow if melted, which fell during that period, were to fall at once it would cover the earth to that depth. The rain is caught as it falls in a vessel exposed to the open air day and night, and afterwards measured in a graduated tube, of which a cross-section is equal in area to the one-hundredth part of that of the vessel. The snow is melted and then measured, or, which is found by repeated trials to give the same result, if the snow be not more than ordinarily moist, ten inches of snow are estimated as equivalent to one of rain.

It must not be supposed that 37.2 inches, which is the mean quantity of rain at Gettysburg, is also the mean for every other place. The annual quantity of moisture is a very variable item, being very much influenced by local circumstances, but in general diminishing with the increase of latitude. In some localities in the equatorial regions the yearly fall is more than 120 inches or 10 feet.

The whole amount of snow which fell from the first of January until April was 31.37 inches, whilst that of December alone was 23.5 inches, showing a considerable deficiency in the beginning of the year; a partial compensation having however been produced by several inches of rain, which fell during that period.

To CORRESPONDENTS.—As we are anxious, if possible, to publish every number of the Record and Journal at the commencement of the month, Correspondents will please to send us their communications by the middle of the preceding month.

Pennsylvania College, Gettysburg, Pa.

FACULTY AND INSTRUCTORS.

Rev. C. P. Krauth, D. D.—*Pres't and Prof. of Ev. of Christ., Moral Philos'y, &c.*
Rev. H. L. Baugher, A. M.—*Prof. of Greek Language, Rhetoric, &c.*
Rev. M. Jacobs, A. M.—*Prof. of Mathematics, Chemistry and Mechanical Philos.*
Rev. W. M. Reynolds, A. M.—*Prof. of Latin, Mental Philosophy, &c.*
M. L. Stoever, A. M.—*Prof. of History and Principal of Preparatory Department.*
Rev. Chas. A. Hay, A. M.—*Prof. of German Language and Literature.*
Herman Haupt, A. M.—*Professor of Mathematics.*
W. H. Harrison.—*Assistant Prof. of Languages.*
David Gilbert, M. D.—*Lecturer on Anatomy and Physiology.*
Rev. J. G. Morris, D. D.—*Lecturer on Zoology.*
Wm. Albaugh, A. M.—*Tutor and Teacher in Preparatory Department.*
Mr. H. R. Geiger.—*Teacher of Writing.*

Pennsylvania College has now been chartered about fourteen years. During this time its progress has been such as to gratify the most sanguine expectations of its friends. The course of studies is as extensive and substantial as that of any Institution in the Country. The *Preparatory Department* provides for instruction in all the branches of a thorough English, business education, in addition to the elements of the Mathematics and Classical Literature. The *College Course* is arranged in the four classes usual in the Institutions of this country.

The government of the students is as energetic as their circumstances seem to require. They attend at least two recitations a day, Church and Bible Class on the Sabbath, and are visited in their rooms so frequently as to preclude the danger of any great irregularities. It is believed no Institution in the United States has more exemplary young men in connexion with it. They are all required to lodge in the College Edifice, special cases excepted.

The annual expenses are—for board, tuition and room-rent, during the winter session, $61 87½: for the summer session, $41 87½. Washing, $10 00; and Wood, $3 00. Total expense, $116 75. Boarding can be obtained in town at $1 25 per week.

There are two vacations in the year, commencing on the third Thursdays of April and September, each of five weeks continuance.

Acknowledgements of Donations to the Cabinet of the Linnæan Association of Pennsylvania College.

January, 1846. From *Mr. A. Stoner*, Waynesboro', an oil-painting of the Nativity.

2. From *Mr. J. Downing*, a *genuine* Herculea clava.
3. From *Mr. D. Stover*, specimens of sulphuret of iron.
4. From *Mr. Victor L. Conrad*, Colubres, and specimens of iron pyrites.
5. From *Mr. J. Baugher Bittinger*, 32 coins.
6. From *Mr. Matthew Miller*, a specimen of the snipe (Scolopax galinago), and a coin.
7. From *Mr. Conrad Weaver*, several specimens of dried plants.
8. From *Mr. Wm. Brauns*, two coins.

Terms of the Record and Journal. *One Dollar per annum in advance.*

Address—"*Editors of the Record and Journal, Gettysburg, Pa.*"

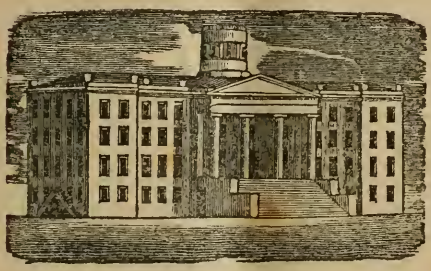
VOLUME II.] [NUMBER 4.

THE

LITERARY RECORD AND JOURNAL

Of the Linnaean Association of Pennsylvania College.

FEBRUARY, 1846.



CONDUCTED

By a Committee of the Association.

CONTENTS.

1½ sheet, periodical—Postage, 2½ cents, to any distance within the Union.

NEINSTEDT, PRINTER, GETTYSBURG.

THE LITERARY

RECORD AND JOURNAL

OF THE LINNÆAN ASSOCIATION OF PENNSYLVANIA COLLEGE.

Vol. II. FEBRUARY, 1846. No. 4.

THE NATURAL HISTORY OF LEPIDOPTEROUS INSECTS.

From the French of Boisduval.

The Larva, or Caterpillar state.

When they come forth from the egg, the little caterpillars or larvae are in their form more or less cylindrical and elongated; their bodies are composed of twelve segments or rings; the head shining and scaly; and the feet at least ten and at most sixteen in number.

The *head* is formed by two different rounded and scaly caps, presenting upon each side small, black points, projecting with greater or less distinctness, like the eyelets, but apparently not serving for vision. The mouth situated at its forepart, is very different from that of the perfect insect; it resembles that of the insects called daubers; it is composed of two horny mandibles, more or less sharp according to the species, two lateral jaws each having a very small palpus, a lower lip protected by two similar palpi, and a small cylindrical nipple perforated by a little hole which has been called the *spinneret* (filiére,*) or *fusus*, as it is from this that the threads of silk which the caterpillar spins, issue.

The *body* has along its sides, near the base of the legs, respiratory openings, breathing-holes or *stigmata*. Nine have been counted upon each side, one upon each ring, except the second, the third and the last, which are destitute of them. These organs are of an oblongated form, and resemble little button holes. They recur again in the perfect insect. They are generally quite distinct, their color being different from the ground color, though in some species they cannot be seen without the aid of a glass. The *Aglossa pinquinalis* seems at first view to be destitute of them, but upon examination it is found that they are covered

.* I translate this word by the term employed by Kirby and Spence, though the ideas which they convey are not the same.—Tr.

by the folds of the rings, which seems a provision against their being filled with the greasy matter upon which this insect feeds.

The *legs* of these caterpillars, like those of most other larvae, are of two sorts, *horny* or *true legs*, and *membranous* or *false legs*.* The former contain in them the legs of the butterfly, the latter disappear entirely in the perfect insect. These latter are a kind of nipple which the insect can at its pleasure elongate, contract, and dilate, in most instances terminated by a hook, which, however, is frequently wanting in some genera. They are more indispensable to the caterpillar than the horny legs which only serve for walking, but do not aid in clinging to the stalks or beneath leaves of plants. Their number varies from four to ten; Reaumur says, that he has seen some caterpillars of Tineidae that had but one pair of membranous legs, but I have never discovered any such. Their relative length likewise varies. The horny legs seldom differ much in this respect, though in the *Harpya fagi* the first pair is of ordinary length, but the other two very slender and as long as in the perfect insect.

The caterpillars of Rhopalocerata always have sixteen legs, as have also the Sphingidae of the older authors. In the Bombycidae and related races there is no exception to this, except that sometimes the last pair of membranous feet is wanting or takes an unusual form. The membranous feet, where the full number is found, are arranged in pairs under the sixth, seventh, eighth, ninth, and twelfth rings, so that the fourth, fifth, tenth and eleventh rings are destitute of them.

According to the number of membranous feet that have disappeared and according to their contractility, caterpillars have been divided into *Pseudo-Geometrae*, *(False-measurers,)* *Semi-Geometrae*, *(Half-measurers,)* and *Geometrae*, *(Measurers.)* The Pseudo-Geometrae are such as have ten membranous legs, as most caterpillars, but in which the first two or three pair are too short for them to be able to use them in walking; thus when they walk the middle of their body forms an arc, as in the *Plusia*, *Euclidia*, etc. The Semi-Geometrae have six or eight membranous legs; they walk so as to form an arc or ring very much like the *Geometrae*. The Geometrae are those that have four membranous legs, such as the *Geometra*, *Metrocampa*, *Hybernia*, etc. These have received the name of *Measurers* or *Surveyors*, (Geometers,) because in walking they raise the middle of their body in the form of an arc by bringing forward their hind feet to their foremost horny feet; they then disengage the forefeet, and holding fast by their hind ones, push their body forward in such a way that they seem to measure the space over

* Kirby and Spence call these *prolegs*, (propedes.)

which they pass. In most of these last the rings are quite hard, and their body resembles a little branch of a tree or a small piece of wood, whence they have received the name of *Rod-measurers*, *(Arpenteuses en baton.)* Whilst in repose they hold themselves upright, clinging by their hind legs to the petiole of a leaf or a young branch in attitudes so fatiguing that it must require great muscular power to retain that position for hours, as they do.*

Caterpillars are more or less vivacious, according to the genus: there are some very sluggish, as those of the Papillonidae, Lycaenidae, etc.; but none is so slow as the *Limacodes* in which the membranous feet are replaced by rows of buttons that are capable of retraction and emit a viscous matter analagous to that secreted by the snail. A great many Geometrae allow themselves to be handled like a piece of wood without showing any signs of life. On the contrary, most of the Cheloniae are very lively and run with great speed.

The locomotion of caterpillars is almost always performed from rear to the front; yet the *Herminiae*, many of the *Botys*, Tineidae and *Tortrices* move backwards with great rapidity, and, when they are disturbed or an attempt made to seize them, they make short leaps in order to escape, as Degeer has observed in the *Herminia rostralis;* but these leaps are not to be compared to those of the *Catocalae* which are astonishing, being perfect somersets.

Besides appendages of different kinds, such as hair, spines, &c. which are found upon the bodies of most caterpillars, in some species we find two retractile tentacula, or feelers, placed upon the anterior edge of the first ring, which the animal puts out and in at pleasure, like the tentacula of snails. This is the fact with the genus *Thais*, notwithstanding Latreille's assertion to the contrary. They range in length and color according to the species, but generally they unite at the base so as to appear in the shape of a Y.

As to clothing caterpillars are smooth, pubescent, hairy, bristly, rough, spiny, callous, &c. Some though destitute of bristles have upon their backs protuberances which give them a very queer appearance, such are the *Notodonta torva*, *Dromedarius*, etc., or callous tubercles resembling the buds of a tree or a sort of knots, as in many *Geometrae*. The caterpillars of nearly all the Sphingidae and of some Bombycidae, have, upon the eleventh ring, a kind of conical horn, fleshy at its base, and horny at its extremity, sometimes smooth and sometimes rough. This organ is generally curved towards the hinder part of the insect.—

* Lyonet counted 4041 muscles in the caterpillar of the *Cossus Ligniperda*.
CUVIER.

The *Sphinx catalpae* is the only exception yet known to this, in which the horn curves towards the head of the insect. In the *Pterogon oenotherae* this horn is replaced by a lenticular spot, and in the *Deilephela vespertilio* it entirely disappears.

The spines of insects are analogous to the thorns of plants, that is, they only differ from bristles in being larger, harder, of a horny consistence and more or less branching. They generally characterize the Rhopalocerata, particularly the tribe of the Nymphalidae; yet some of the Heterocerata are also furnished with them. Those belonging to the genus *Io*, have over their whole body whorls of spines which, entering the hand, occasion such a pain as results from the pricking of the nettle. The caterpillar of the *Cerocampa regalis* bears back of its head, and over its first rings a crown of long and stout spines, which have obtained for it, in North America, the name of "*The horned devil of the Sycamore.*" It is quite an object of vulgar terror on account of its menacing aspect and its spines, which are supposed to occasion very severe pain, but according to the observation of Mr. J. Leconte, it is as innocent as other caterpillars.

The colors of caterpillars are so various that it is difficult to say anything that will apply generally. Nature, intent upon the preservation of the species, has here guarded them against the search of their numerous enemies. Those that are accustomed, like the *Catocala*, *Homoptera*, &c., to cling to the stems of plants, are colored like bark or lichen. Such as are to live upon leaves, are colored like them or like flowers. In short, their color seems adapted to their security from the notice of their enemies. The color is generally constant in each species; yet there are many exceptions to this. The caterpillars of the *Deilephela elpenor*, *nerii*, *celerio*, are sometimes green and sometimes black. In some species no two are found of the same color. The color also changes according to the age of the insect. When about to undergo their metamorphosis, too, they frequently take a new and generally a duller hue. The design is much more uniform than the colors; it may vary in its tints, but the spots and lines by which it is formed always keep their relative form and position, and though they may be effaced or absorbed by the ground-color, yet certain characteristic traits always remain. The design is generally similar in related species, though this is not uniformly the case.

Before their transformation into chrysalids, caterpillars undergo various changes of skin which are called *moultings*. These sloughings are more or less numerous according to the race: Rhopalocerata generally

undergo three or four; Heterocerata generally four, except some hairy species in which seven or eight have been counted.

The skin of the caterpillar is a kind of epidermöid membrane which has only a limited power of extension, and it is easy to conceive that the animal can not remain in this rigid envelope during the whole period of its growth. The resulting phenomenon has a very close analogy with the moulting of higher animals, with this exception, that in the latter the hair does not fall off, whilst in caterpillars it disappears with the general envelope. The cause of this difference is, that in the one case it is adherent to the tissue of the skin and passes through the epidermis, but in the other where that tissue does not exist at all, it is placed immediately upon the external (tegumentary) membrane; thus each moulting of a caterpillar is so complete that it may be taken for the insect itself. This does not extend to the palpi, antennae, and maxillae, which are not found there complete.

The caterpillar, informed by a peculiar instinct that its time of moulting has arrived, prepares itself by dieting for the endurance of that crisis. As this approaches, the colors become dim or livid, the old skin shrivels and splits open upon the back at the second or third ring. The caterpillar in order to get out of this envelope, first disengages the forepart of its body and then the hinderpart. This operation, so troublesome, is sometimes finished in less than a minute. Individuals that have just moulted are easily distinguished by the brightness of their colors, and sometimes the design is different from what it was before. The number of moultings differs in the same species, though in a wild state it may be more regular, but in those covered with hair, when fed in captivity, the number of moultings may be increased or diminished by a more or less abundant supply of food.

THE PROVIDENCE OF GOD IN THE PRESERVATION OF INSECTS.

The Providence of God is wonderfully displayed in the preservation of creatures apparently the least important in the household of nature. It extends to the minutest animals that spend their ephemeral existence on the earth. Not only are the living preserved until they have performed their destined functions, but extraordinary arrangements are made for the perpetuity of the species, so that it is likely very few kinds of animals, of which history gives us any account, have become totally extinct.

In no class of animals is this *perpetuating* Providence more remarkably exhibited than in *Insects*. They, like all other animals, are objects

of the divine protection. The divine Wisdom has means in abundance to preserve them after they are created, and also takes care to carry on the races from generation to generation. It is likely that all the species, in existence four thousand years ago, have been perpetuated down to the present time, and will continue to be propagated until the end of all things on the earth.

Insects, with the exception of one or two species, do not bring forth their young alive, like most other animals, and hence they cannot themselves nourish their offspring, because, for the most part, the parents die before the eggs are hatched, or if they do not, they pay no attention to them. The eggs are then literally left to Providence. But the parent insect guided by an unerring instinct, makes some provision for her future progeny, which she is destined never to see, by depositing her eggs on the very food which is adapted to her young, though she herself never touches that food. The butterfly that lives on the honey of flowers, will not lay her eggs on a flower-cup, for this would be no food for the young caterpillar. The beetle that feeds on leaves will not deposit her eggs on a tree, but on a carrion, or a rotten log, or decayed vegetable, which is the appropriate food of the grub. We call this instinct, but what else is it but Providence?

Many spiders cover their eggs with a silken or woolly web, and carry their bag-like ball with them, until the eggs are hatched. Others suspend the bag by a thread, and remain for a short time in the vicinity, as if for the purpose of guarding it. The water-beetles also usually weave a bag for their eggs, which is externally composed of a viscous paste, and internally of a white silk-like substance, by which the eggs are surrounded, to prevent the intrusion of the water. This sack is fastened to a water plant, so that it is not carried away or broken during floods. It is like a boat safely moored during a storm. In this manner, all insects provide for their progeny in one way or another, and the races are perpetuated without the fostering care of the parent. The young caterpillars or grubs are left to their own resources, but Providence takes care of them.

The eggs resist the effects of the coldest weather. The shells are either of a glassy or horny consistence, so that the weather cannot affect their internal substance, or they are soft and tender, but yet covered with such a thick coating of hair, that they remain uninjured. If the tender eggs of other species lie naked on the surface of the feeding place, they are covered with a sort of varnish which the rain cannot dissolve, and are glued so fast that no storm can shake them off. Those of this sort are not exposed to cold, for they are hatched out during the

same Summer in which they are laid, which is the case with most diurnal butterflies.

Some insects lay their eggs singly on the feeding place, and not all in a lump, as most do: hence these are not liable to a general destruction. Others are so cautious as to lay theirs in the middle of a young and tender chesnut burr, others under bark, others in the pea-pod, others in a rolled ball of dung, in which they are, of course, secure from the attacks of enemies; but is it supposed that they know why they deposit them in such secure places? They know nothing about it. It is with them a purely mechanical act directed by Providence.

But this same divine superintending care is extended to the larva or caterpillar after it is excluded from the egg. As soon as it is hatched, it finds its appropriate food furnished for it, for the egg was laid on it. There is no necessity to go foraging. Their lives are so tenacious, that few perish from the frosts of the Spring. Most of them hide themselves during the frosts, and others, which cannot escape, are capable of enduring a very low temperature. The *Aphides*, or plant lice, are usually the first that are seen. I have seen them out in some warm days in January, but they were overtaken in a snow storm and probably perished.

Many caterpillars are hairy; many naked. Some of the former, when they have attained a moderate size, would be rather a rough mormorsel for a bird, and hence they are let alone. Many of the naked species are so similar in color to the leaves on which they feed that they easily escape notice, and many, besides, when danger approaches, have the faculty of suddenly letting themselves fall to the ground by a thread. Thus also many beetles escape from their natural enemies as well as from the *human* collector, when he advances too near. They double up their legs and fall to the ground among leaves and plants, where further search is fruitless.

Some *larvae* have a paper or leather-like sheath or covering, from which the head alone is visible, and into which it is quickly drawn and the orifice closed, when the enemy draws near. These coverings they carry with them, just like snails their shells. Others cover their bodies with small pieces of plants or sand, so that they are encased, as it were, in a coat of mail. Others weave around them a large web and continue in it until all the leaves enclosed are consumed, and then the community moves to another leafy bough, and perform the same mutual protective functions, until they are full grown, and ready for their transformation.

The larva of a grasshopper species surrounds itself with a froth-like substance, which no bird or ravenous insect will touch, and thus it is

secure. Others cover themselves with their own excrements, for which they are provided with two anal processes, which they bend forward over their bodies, and thus form a sort of umbrella. These are a few of the thousand ways, in which Providence perpetuates the race of insects.

The various *chrysalides* or *pupas*, into which the *larvae* are transformed are for the most part, without motion. As they are unarmed, they easily become a prey to their enemies, but Providence takes care that the race is not annihilated. Many of the larvae undergo their change underground, where, though they are not secure from enemies, they are yet comparatively safe. Others, which are transformed on trees or plants or other places above ground, cover themselves with a thick web, or with hairs plucked from their body, or seek concealed places. Others weave leaves around themselves, which of course, dry up, and then they cannot easily be distinguished from the mass of leaves hanging or lying around. Those which are not thus covered, and which are exposed to the winter, are exceedingly tenacious of life, and in the Spring the tender butterfly comes forth.

But the perfect insect is also an object of Providential care. As soon as the butterfly comes out from its chrysalidan cradle, and the warm sun evaporates the juices, and hardens its clammy wings, it sails forth, and immediately finds a thousand flowers, with open petals, inviting the beautiful voyager to stop and taste the nectar already distilled for its use.—It alights, and unrolling its long spiral proboscis, inserts it deep into the cup and draws in the delicious fluid.

It floats along gracefully and happy in its new-born existence; its broad expanded wings, studded with diamonds and pearls, flash in the sunlight and charm the eye of the admirer of nature. Free from care, and dressed in a gorgeous livery, it seems designed for enjoyment alone. It is nature's winged gem,—"with silver fringed and freckled o'er with gold,"—it lights on the bosom of some variegated flower and adds brilliancy to its tints; idly fluttering along, sipping here and there of nectared sweets, it encounters a gay companion; they both mount up high in the air performing the most graceful evolutions—there seems to be a fierce contention—but it is the conflict of the tender passion. They part never to meet again; soon one of them is seen fluttering around a particular plant or tree, and reposing on it for a moment, then flying off to another place and repeating the same performance. She has deposited her eggs; soon after she droops, and her short-lived, butterfly-existence of a few weeks, closes. But her eggs are in the care of Providence, and in the appointed time, a new generation will come forth to enliven nature, and to display the wonder-working power of Providence.

"Child of the Sun! pursue thy rapturous flight,
Mingling with her thou lov'st in fields of light;
And where the flowers of Paradise unfold,
Quaff fragrant nectar from their cups of gold.
There shall thy wings, rich as an evening sky,
Expand and shut with silent extasy.
Yet thou wert once a worm, a thing that crept
On the bare earth, then wrought a tomb and slept!
And such is man; soon from his cell of clay
To burst a Seraph in the blaze of day."

J. G. M.

THE ANT-LION.

A traveler of undoubted veracity, was passing through a very wild and barren country, which presented not the least sign of being inhabited, or of ever having been cultivated. He was wrapped in quiet meditation and entirely unconscious of what passed around him, when suddenly he was aroused by seeing a deep pit directly before him. He immediately made an effort to turn back, but the ground gave way beneath his feet and he was precipitated to the bottom, enveloped in a mass of rocks and rubbish from which he could with difficulty extricate himself. Being, however, at length freed from the heavy burden which had rested upon him, he set about examining the singular circumstances in which he was placed. The pit was shaped like a cone with its apex downwards. The sides sloped regularly upwards and were strangely formed. The stones and bits of wood of which they were composed seemed to lie so loosely as if purposely arranged so as to aid in its descent whatever had once fallen over the edge of the cavity. This was the case all the way around, except at the place where the traveller had slidden down; there the regular crest was removed, and in its place were seen the rugged rocks and clayey soil peculiar to that region of country.

Struck by so singular an appearance our traveler forgot his bruises and fatigue, and commenced speculating upon the probable origin and design of the remarkable cavity into which he had been so unceremoniously introduced. Could it have been formed by rains, washing into an ancient quarry the disintegrated rocks and rubbish of centuries? No, for then its sides would have been worn away into deep excavations and the lower part would soon have been filled up. Besides, this bore about it the indubitable marks of design and of having been but recently made. It could not have been formed by wild beasts, for they delight in impenetrable jungles and dense forests, and do not make their dwellings in

the open country: besides, their dens are never of this form. How then could it have been formed, and for what purpose was it designed?

These were questions of much interest to the traveler, but he was unable to answer them. He came at length to the conclusion that he had made a new discovery, and intended to give this day's adventure a prominent place in his book of travels. But the most interesting part of his adventure was yet to come, for no sooner did he make a move to go; bracing himself up, and gathering all his strength for the difficult ascent, than he felt the loose soil heaving and rocking beneath him. Terror added strength, and he was himself astonished at the ease with which he made his way over the crumbling rocks, which, artfully arranged, were continually sliding away from beneath his feet. He had already half gained the surface, and was congratulating himself upon his supposed escape, when suddenly the air about him was filled with showers of stones that fell thick and fast. He was in a moment prostrated, and before he had time to rise, felt himself sliding back again with fearful rapidity. He looked downward, and Oh! what a sight he there beheld! Two terrific jaws "of vast extent and power infinite" were wide-gaping to receive him. The body of the monster to which they belonged were concealed from his views; but he desired not to see it, for there was sufficient in its appalling visage to convince him that no mercy was to be expected at such hands. He made a last, a desperate effort to escape, and succeeded, though excited rage, and disappointed gluttoning aroused the hideous monster to exert all its power to detain him.

Suppose now that a person would stand up before you and declare that all I have here stated is literally true, that it had happened to himself: how would you regard his account? You would say, "He must either be a fool or a madman." And why so? "Oh," you will say, "we never heard of there being such a vast monster in any part of the world, or of its diging deep and artfully contrived pits and concealing itself at the bottom to watch for prey. If this were really the case it would have been known long ago, and we have of late heard too many fish-stories to be hoaxed by every wandering imposter and self-styled traveller." Strange and incredible as this narration may appear, yet, *mutatis mutandis* it is an *ad verbum* description of what will soon be daily occurring within the reach of your own observation. During the hot, dry summer months which will soon revisit us, walk out into the woods and direct your steps to the side of some large tree, which, stretched along the ground, is undergoing the slow process of decay. In the crumbling mould spread around it you will very probably find some conical holes several inches in depth, and corresponding in every respect except size, to the descrip-

tion already given. If then you desire to have the scene, above attempted to be described, enacted before you, take your seat by the side of one of these pits and wait until some straggling ant or blundering beetle in its hasty march, precipitates itself into this fatal chasm, and arouses the lion in his den. You will thus have an opportunity of witnessing the wonderful means to which the ant-lion resorts in order to capture his prey.

But you may object to this kind of reasoning, and say that it is unfair. The wonder, excited by the narrative of the traveler in the monster's den, evaporates when the actors in the tragical scene dwindle into insignificant insects. But why is this so? Is there any reason for regarding so remarkable a transaction as less wonderful, because the participants do not possess huge size and great strength? Should we not rather regard these little animals with increased admiration, because, in such diminutive forms, are united such bitter animosities, such singular faculties, such remarkable instincts and such an endless variety of peculiarities? Yet it is too true, that this part of nature is by most persons passed over with calm indifference, with entire neglect, for no other than this very absurd reason, that insects are objects too trifling to engage their attention. If they would see a six-legged beast, with a body as large as a hogshead, forming, with a material drawn from its own body an apparatus by which it could sail about in the air, they would gaze with open-mouthed astonishment; and yet they scarcely think it worth while to watch the gossamer spider going through his exploits, because he is "nothing but a spider."

The mathematical accuracy of the honey-bee; the regular pitched battles and cruel slave trade of the ants; the architectural skill of the hornet and numerous other insects; the sly craftiness of the hunting spider; these, and a thousand other entomological wonders, they never consider worthy of their notice. "Go to the ant thou sluggard, consider her ways and be wise." OBSERVER.

GRECIAN EDUCATION, NO. V.

Pythagoras prohibited bloody sacrifices, and directed that the altar erected for the worship of the gods, should not be stained with blood. He prohibited swearing in the name of the gods, saying that every one should aim to render himself so worthy of belief, that nothing more than his assertion should be necessary to secure confidence. In the intercourse of life, it should be our aim not to make enemies of friends, but friends of enemies. He inculcated veneration for law, and opposition to

wickedness. The distinction of animals, not noxious to man, he forbade. These are but a brief specimen of the maxims of this distinguished sage. It is, however, as much as is needed to make us acquainted with the philosopher who stood at the head of the Ionic school. Our attention should now be turned to the course he pursued in developing the faculties of the human mind. His reputation will rise in our estimation when we contemplate his agency in calling forth the faculties of the human mind. Parents, in his view, were the proper instructors of their offspring, and their separation was the greatest injury. In this then, is a striking difference between him and Lycurgus. Religious education, which was so important an element in his scheme, was the ground of the required connection between parents and their children. The whole period of youth was dedicated to education and each age had its appropriate treatment.

In eating and drinking children are easily trained to what is proper, and nature makes this training necessary. The inferior animals are otherwise provided for. Boys should be habituated to abstinence and regularity and likewise young men, otherwise boyish irregularities, such as idleness and playfulness, will be united to the headiness and excesses of youth. In neglect of this, many of the defects of later life, have their origin at an earlier period, for instance, ambition.

Pythagoras taught Mathematics, Astronomy, Natural Philosophy and various branches of the healing art. Astrology he considered of no value. Divination and physiognomy he reduced to fixed principles.

Differing, says Schwartz, from most others, who have distinguished themselves, he combined the philosopher with the teacher. He so exercised the minds of his pupils as to give them a direction and impulse which prevented their becoming the mere echo of their teacher, as is so frequently the case. They became independent thinkers capable of maturing their own minds. A capacity for this was his special aim; this was the *Ευμαθια*, which he regarded as combining three elements, *οξυτης, αγχινοια, μνημη.*

His pupils were required to impress deeply upon their minds what they were taught, and not permitted to advance a step till they had done so. Before rising in the morning, they repeated verbatim, what they had learned the day before and previously. In this way, they were excited to reflection and study. They were required to be engaged with the whole soul in whatever they undertook. Study was made a serious business. It was not pursued as it is too often now.

Now very frequently every artifice is resorted to in order to escape study, to render null and void the advantages we enjoy.

How often are they deceived who are deeply interested for us, that we may injure ourselves. When we look at the ancient discipline in these heathen schools, how ardently science was pursued and what was effected, it appears that we live in a degenerate age, falling as we do in many respects so much below those, whose advantages were far inferior to ours.

Before being received, pupils, were examined and their physiognomy inspected; afterwards a probation of three years ensued, during which time strict supervision was exercised, particularly were they scrutinized in regard to vanity. After this, a full admission took place. Five years were spent in the silent reception of instruction, afterwards they entered into full communion with the teacher. Moral purity was considered indispensable. Instruction without this, would pervert and corrupt; it would be like pouring clear water into a well filled with mud. For philosophy, there must be a preparation as there is of cloth for dying, and above every thing else was it esteemed necessary that the two fundamental vices should be eradicated, viz. intemperance and avarice.

Judging this system in its principles, it certainly deserves our highest approbation, testing it by its results our verdict will be no less favorable. On the one hand, it was well calculated to develope the entire man, both intellectually and physically, and furnishes many of the best principles of modern systems of education, on the other, the experiment was in a high degree successful.

It is a matter of notoriety that the happiest consequences flowed from this school of instruction. Unrivalled in his theoretic views in ancient times, the system of Pythagoras produced men whose reputation will never perish.

Our attention will next be directed to the Athenians and having contributed something towards an estimate of their educational views and processes, our remarks will end.

SOCRATES.

Sapiens, qui sibi imperiosus,
Quem neque pauperies, neque mors, neque vincula terrent.

The only amaranthine flower on earth
Is virtue, the only lasting treasure truth.

Few subjects possess so much interest for contemplation as the lives of the truly great in past ages. And among the noble examples of moral purity and dignity the Pagan world has produced, the greatest and

best of all is the illustrious Socrates, whose memory is embalmed with peculiar odor, and whose influence *perennius ære*, will live and spread with the imperishable literature of Greece. His claim to the highest rank assigned him is unquestionable, whether we regard the unblemished integrity of his life, his extraordinary wisdom, the purity and elevation of his opinions, his enlarged and warm benevolence, his disinterested zeal and firm devotion in promoting the happiness of his fellow men, his fixed tenacity of purpose, the remarkable modesty and unaffected simplicity with which he prosecuted his investigations, his simple hearted love for truth, or the close harmony of many of the doctrines which he taught with that better wisdom now shed upon our souls by light from above. His image, in its grandeur unequalled, rises above all others furnished by the resplendent pages of classical antiquity. In Socrates, head, heart and hand—reason, feeling and action were all combined, duly proportioned and perfectly harmonized. Not to admire a character so symmetrical and complete were impossible; the best of the ancients have united in doing honor to his memory, and the most distinguished of modern poets declares—

> "Him, well inspired the oracle pronounced
> Wisest of men!"

Referring to a Delphia response delivered during his life time, that

> "Sophocles was wise, Euripides wiser,
> But Socrates wisest of all."

In the opinion of Cicero, (Tusc. Quæst.) it was Socrates, who first brought down philosophy from the skies to dwell upon earth, made her even an inmate of our habitations, applied her divine doctrines to the common purposes of life and directed her researches to the real interests of men in the pursuit of the highest attainable happiness.

> "Tutor of Athens! he in every street
> Dealt priceless treasure: goodness his delight,
> Wisdom his wealth, and glory his reward.
> Deep through the human heart, with playful skill
> His simple question stole; as into truth,
> And serious deeds he smiled the laughing race;
> Taught moral happy life, whate'er can bless
> Or grace mankind; and what he taught he was."

Xenophon and Plato, the most celebrated of his pupils, have recorded the actions, sayings and opinions of this venerable sage, and to them are we indebted for the knowledge we possess in reference to him.

Socrates lived in the age of Pericles, the golden era of Grecian literature, and was on terms of intimacy with the most gifted sons of genius

that flourished at that period. Herodotus and Thucydides, the historians, Aschylus, Euripides and Sophocles, the dramatists, Callicrates and Phidias, the sculptors, Zeuxis, the painter, Hippocrates, the father of medicine, were all known to our philosopher, and he was esteemed the greatest among the great. Although of humble extraction, the son of a statuary, wisdom adopted him as a favorite child and bestowed upon him a nature of imperishable lustre. Although his physiognomy was so unprepossessing as to resemble a satyr and a buffoon, his soul was all virtue, and from within issued such sublime and pathetic things as brought tears from the hearer and melted the most obdurate heart. His father, Sophroniscus, furnished him with the best facilities for mental culture and in early life placed him under the instruction of that eminent teacher, Anaxagoras, whose sublime principles of theology soon exerted an influence upon his mind and laid the foundation of that exemplary character which has been the admiration of the world. From his youth he was wholly intent upon the acquisition and communication of knowledge; and was deeply impressed with the conviction that an obligation rested upon him to persuade his countrymen to the practice of moral excellence: with this was united a noble contempt of his own private emolument, which induced him constantly to decline and refuse all those compensations, which from the value of his instructions might have rendered him wealthy. His whole life was public, open and in the sight of all men, and in cordial fellowship with all: and such was the originality and grandeur of his sentiments, the eloquence and power of his expressions, that the most exalted individuals, of whom the city of Minerva could boast, were attracted to his abode—men of rank and wealth, statesmen and scholars, poets and historians, orators and philosophers listened with mingled emotions of pleasure and wonder to the lessons of wisdom as they fell from his lips. The multitude too were his hearers in the crowded *agora;* and all his energies were directed to the single purpose of rendering them wiser and better. This paragon of excellence, however, became an object of hatred to the fickle and corrupt Athenians.—He had especially excited the jealousy and raised the ire of the vain sophists, pseudo-philosophers, *whose whole science consisted in an artificial apparatus of general arguments which they could apply to every subject, and by which they could maintain, with an appearance of plausibility, either side of any question.* Socrates having no sympathy for their mercenary quackery and holding in detestation their inane paradoxical hypotheses, fearlessly unmasked their pretended excellencies and destroyed their credit with the people. In opposition to the prevalent sentiments, he taught that there was one supreme Providence "whose eyes

could not be blinded by the smoke of sacrifices, but who loved virtuous actions better than sumptuous forms," and for this reason they poisoned the minds of the populace with the belief that Socrates taught impiety against the gods; and because the most ingenuous and virtuous sat at his feet and learned his precepts, they charge him with being a corrupter of youth. The caustic wit of Aristophares, in the comedy of the *Clouds* was directed against this teacher of virtue, introducing him as a ridiculous and flagitious pretender to the occult sciences, and ludicrously representing him as hanging in a basket and inculcating the most disorganizing doctrines; and although the success, which the poet promised to himself, was not at first realized, owing to the high estimation in which the philosopher was held, yet the calumnious effort, embittered by the craft of designing priests and demagogues, no doubt, had considerable influence in originating the public indictment, which twenty-three years afterwards, was drawn up against him. Lysias, the greatest orator, whom Greece at that time afforded, had prepared an elaborate discourse and proposed to defend him, but Socrates declined the offer, exclaiming, *I will not suppose my judges interested in my condemnation, and if I am guilty, I must not, by persuasion, endeavor to avert the award of justice.*

Justum ac tenacem propositi virum,
Non civium ardor prava jubentium,
Non vultus instantis tyranni,
Mente quatit solida.

To the accusation he himself made a dignified and eloquent reply, characterized by a manly fortitude of conscious innocence, recanting none of his opinions, denying the charges and asserting that his countrymen owed him reward and not punishment. It, however, availed nothing; the passions of a capricious and tumultuous people were excited—he had offended the nation—he had advanced sentiments which they disapproved, and nothing could appease them but his life—and thus the "best, the wisest, and most just of Athens" expires—dies a martyr to the truth—a victim to popular prejudice; exemplifying the sentiment so beautifully expressed by Milton:

Virtue may be assailed, but never hurt,
Surprised by unjust force, but not enthrall'd:
Yea, even that which mischief meant most harm,
Shall, in the happy trial, prove most glory.

How often has it happened that the multitude, in an hour of false excitement, have been driven to shed the blood of their greatest benefactors! The next moment their eyes have been opened and the objects

of their fatal violence have become the objects of their greatest veneration. But they cannot retrieve what they have done. They can only canonize the martyr and pile up blocks of marble to his memory.

The best defence of Socrates is afforded in the mingled sentiments of pity, shame and resentment which the Athenians suffered after his death. His accusers were persecuted and declared enemies to the state; some were condemned to death; sentence of exile was passed on others, and in such execration were they held, that the cities, to which they fled for protection, refused to receive them, and after they had ejected them from their walls, they stoned them to death. It is also stated, that, when the Palamedes of Euripides was performed, and the line recited—

"*You have given to cruel death the best of all the Greeks!*"

the audience, reminded of Socrates, burst into tears, and the whole theatre resounded with expressions of grief.

In consequence of some religious ceremonies, the celebration of the Delian festival, there was a respite of thirty days between the iniquitous sentence and its execution. These mournful days were passed worthy not only of the hero, but of the philosopher. His friends furnished him with facilities for effecting his escape, and earnestly urged his compliance with their wishes; the jailor was bribed; a vessel was prepared; and a safe retreat provided, but no arguments, no admonition, no entreaty could induce him to use the opportunity offered. He tried to convince his friends that wrong never justified wrong, and that it is right to obey the law even when its commands are unjust. Until the last moment, with the deadly draught before him, he continued to advocate sublime truths almost in the spirit of inspiration; with his usual cheerfulness and serenity he conversed with his disciples, and entreated them to remain steadfast to their principles, presenting the immortality of the soul as an incentive to fidelity. He ordered them to dispose of his body as they deemed proper, but to conceive of Socrates as an emancipated happy spirit. The narrative of this sad scene, as given by Plato, is one of the finest specimens of simple, eloquent and affecting description to be found in any language. In reference to which, Cicero offers this strong declaration, that he could never read it without tears. Says a gifted writer of the present day, it were in vain to attempt translating the dying scene from the Greek, for the very words seem to sob, and the sentences mourn as if they came from a broken heart, so that it has won from the learned of all ages the tribute of our tears, as if our universal nature suffered in him.

The secret of Socrates' accusation, condemnation and death is to be

traced to the fact that he taught a wisdom too pure for the comprehension of his countrymen: he told them truths which they could not bear to hear. He, on a certain occasion, said to the Athenians, that they always exiled or condemned by form of law their most distinguished citizens, and that no man could expect to live long, who uttered the truth and advised for their good. An infatuated people, that had already *ostracised* Aristides, because tired of hearing him called just, was prepared to commit any outrage.

Reserving, for a future number, what we have to say on the philosophy of this great man, we will conclude with the subjoined beautiful tribute from the *pleasure loving* yet *aspiring* Alcibiades. "When I heard Pericles or any other great orator, I was entertained and delighted, and I felt that he had spoken well. But no mortal speech has ever excited in my mind such emotions as are enkindled by this magician. Whenever I hear him, I am as it were chained and fettered. My heart leaps like an inspired Coryphant. My inmost soul is stung by his words as by the bite of a serpent; it is indignant at its own rude and ignoble character. I often weep tears of regret, and think how vain and inglorious is the life I lead. Nor am I the only one that weeps like a child and despairs of himself; many others are affected in the same way."—*(Plato's Symposium.)*

THE MOONSHEE DOCUMENTS. NO. I.

It is with the utmost diffidence, that the writer presumes to lay before his intelligent readers, the series of translations, of which the following may be the precursor. Quietly engaged in a course of studies, which were commenced as mere amusement, and pursued on account of the strange excitement attending them, he little thought of obtruding this necessarily imperfect result of his labors upon the notice of the public. However, the "even tenor of his way" has been disturbed; and, by the solicitations of his friend Awr, who, besides placing him in a responsible position before the readers of the Journal, has been kind enough to speak rather flatteringly of his work, he is induced to tempt the cupidity of the curious, by exposing to their view at least one jewel from his casket. Others cannot be expected to judge so loosely, and therefore, in justice to himself, he thinks it proper to make a few explanations.

The difficulties in his way, he may be pardoned for saying, have been of no ordinary character. With the exception of Awr and himself, there is reason to believe, that no mortal had any intercourse with the great Naturalist and Philosopher, Mot, who was the author of the letter,

a translated fragment of which appears in the Journal, vol. I, p. 267 *et seq.* He was a being of a peculiar character, as may be inferred from another extract from his correspondence which we give below; and, in our intercourse with him, we seemed under a species of enchantment.—We were, at once, mutually teacher and pupil, studying each other's language; and it was from him, that the *Moonshee Documents* were, from time to time, obtained. We do not deem it prudent to make any farther revelation of the manner in which we yet hold communication with him, lest the scenes of Salem witchery should be revived.

The following extract is given in preference to other matter of higher excellence; *firstly*, because it is from a communication addressed to the writer; *secondly*, there seems to be some connexion with the previous fragment; and *lastly*, gratitude prompts the bringing forward, as the "first fruits," something from the pen of him, to whom he is so much indebted, and with whom he holds so mysterious a connection. It has been placed in his hands within a few days. With not a few misgivings, cheered nevertheless by hopes of kind indulgence, this little bark is launched upon the waves of public opinion.

"*East Limb*, 97041th month.

QUEER———

I write under great depression of spirits. The cause of this I will proceed to explain, for, having bathed in the sympathies of your soul, I dare not resist the impulse, which urges me to communicate to you, from time to time, small understandings of my nature.—Know then, that, although agreeing in some particulars of our organization, in many we materially differ. Some limbs and faculties which you possess, we have not, some, which you are without, we have. In addition to the five powers, which you call senses, we have another; viz.: [illegible]* by which we are brought into what may seem to you, the strangest connection with those for whom we form an affection. For the present, it may suffice to say, that whatever annoyances or pains they may feel, these are experienced by us with twice the intensity; and this too, however far we may be from each other, and in circumstances how different soever. With us, this is not a source of misery, for there is so much purity, that ages have passed away since an instance of one disturbing the peace of another has occurred. When I first visited Earth, I was altogether unaware, that, with you, a different state of things existed; and, in consequence, was ensnared, as I will now proceed to show.

*It is impossible to translate this term into English; and, as our author goes on to point out some of its characteristics, it is deemed unnecessary. We would give the pronunciation, did not a mysterious awe hang around the sound which forbids the attempt.—TR.

Do you recollect that one of your species, whom, when I was in a measure ignorant of your capacities and high endowments, I desired to capture for our great Cabinet? I could not help loving him, both on account of his [illegible],* his natural parts, his pursuits, and withal his healthy proportions. I at once formed a union with him, which must yet continue 50 lunations.†

Do you wonder then, that I have deep reason to regret my sojourn among you; or, at least, my unwariness in suffering myself to be entrapped in a snare, the meshes of which are strangling all the happiness of my existence? But a short time since, I was thrown into awful convulsions. Hideous visions of demoniac feathers, filled at one end with a black fluid, and darting into my inmost spirit, continually haunted me. A terrific monster was following my out-wanderings, and, at a black hour, rushed upon me, wielding a huge club, upon which I saw in fiery letters, the word Naturalist in your language. I know not what it means, but suppose no good attaches to it. The very awkward way in which he handled this weapon, made me apprehend the most fearful results.—With eyes glaring wildly, he clutched my throat; and, whirling his club above his head, gnashed his tusks horribly. I gave up all for lost: but what was my astonishment, when the weapon crashed down upon me, to find it a mere phantom, only enveloping me in a cloud of mist. Finding that he had not succeeded, he did not attempt to use upon me, a short, rough, dirty dagger, which swung at his side, labeled, in like manner, Pun, (in your next tell me the meaning of these words,) but contented himself with shaking it in a threatening manner. At length the bright spirit of Forgiveness came to my aid, and I was enabled to look him steadily in the face; perceiving which, he endeavored to avoid my gaze. I persisted, when he, with a low muttering, rapidly retreated, casting back an occasional furtive glance, until he suddenly disappeared among the mountains.

*We hope we may be pardoned for allowing this term to stand as it is. It is better, that the curiosity of the many should be excited, than that the sensitiveness of one should be shocked.—Tr.

†The expression, translated *lunations*, would be more properly rendered *year*, to which it corresponds, not in length of time, but in its general signification; it being the period of the revolution of the moon on its axis. The curious fact, here hinted at, deserves some explanation. This mysterious union, or moon-friendship, is subject to several curious laws, one of which is the following, "The commingling of kindred spirits must, of necessity, as hath been well decreed, continue seventy Lunations. Seventy Lunations are the beginning and the end thereof."—Olev, on the Heart, vol. 99, p. 6.

At the end of the period mentioned, all affection or sympathy is in *statu quo*; and, if desired to be continued, must be renewed. When once this union takes place, the sense above alluded to, is called into full activity. Further developments may enable us to explain its phenomena more fully.—Tr.

In the deepest distress, I immediately began to exercise myself, and discovered, that these horrors arose from my connection with ———, on Earth. Oh why! my little comforter, why do you not dwell at peace among each other? Why do you, for the mere sake of seeing the dust it will raise, tilt the rock over the precipice, when, in its headlong fall, tender flowrets, beautiful trees, and human life itself are swept before it? Why, oh why! shut out from yourselves our yearning sympathies, when, from my own sad experience, others are deterred from visiting you, and by their intercourse, raising you above sublunary things? Do, I entreat you,—I beg of you, do ————."

Here the emotions of our noble friend appear to have overcome him; and he quits a subject, so painful to his keenly susceptible nature.—The remainder of the communication is of such a character, that we cannot allow it to reach the public eye.

SIBERIA.

Upon this country nature has not lavished her bounties, but, with cold indifference, has meted out a scanty subsistence to the wretched natives. The bosom of the earth is not opened by the genial rays of the sun, presenting to the delighted gaze fruits and flowers, but, locked up in the embrace of ice-bound winter, wears a perpetual winding-sheet.—Historical antiquity has not touched, with its charms, the rivers, plains and mountains of this dreary land, or consecrated them, by military achievements, or the productions of science and art. It is a land without the limits of history, over which nature, unbroken by civilization, yet holds savage and stubborn dominion. Notwithstanding all this, it contains within it the germs of interest and instruction.

Siberia derives its name from Sibir, a Tartar word and the name of the capitol of a Tartar government founded on the banks of the Irtysh and Obi in 1242. It is almost identical in signification with the Russian word Seweria, or country of the north; the letter *b*, in that language, being pronounced like *w*. Of this city, which was situated ten or eleven miles from the present city Tobolsk, on the river Sibirka, it is with difficulty that some obscure remains can be found. In 1580 it was wrested from the Tartars by the Cossacks under Jermak Timofeyew. The northern boundary of this country is the Frozen Ocean, on the east are the Eastern Ocean and Behrings straits, on the south the Altay and Daoorian mountain chains, on the west the Uralian mountains, separating it from Europe, and on the south-west the Algydinshalo mountains, which divide it from Independent Tartary. Its length from east to west cannot be

reckoned less than 4000 miles, and its breadth from north to south varies from 1100 to 1900. Its surface is about five millions of square miles, which is larger by two-sevenths than the whole of Europe.

The *climate* is the first particular which will engage our attention.—Striking and peculiar features present themselves here, which modify the whole aspect of nature. The southern and the most favored part of Siberia is blessed with a temperature in mildness not to be compared with that of Norway, whilst the northern and eastern portions are the regions of perpetual ice and snows. Here agriculture is unknown. The influence of the sun, during the short period in which he visits with feeble and sickly rays the surrounding desolation, does not penetrate the earth more than a foot, and soon bleak winter returns to resume his tremendous dominion. "As early as August, it begins to snow; and the whole ground is covered, to the depth of two or three feet, before the month of October. Along the shores and bays, the fresh water, poured from the rivulets or drained from the thawing of former collections of snow, becomes quickly converted into solid ice. As the cold augments, the air deposits its moisture in the form of fog, which freezes into a fine gossamer netting or spicular icicles dispersed through the atmosphere and extremely minute, that might seem to pierce and excoriate the skin. The hoar frost settles profusely in fantastic clusters on every prominence. The whole surface of the sea steams like a lime-kiln, caused, as in other instances in the production of vapor, by the waters being yet relatively warmer than the incumbent atmosphere. At length the dispersion of the mist and the clearness of the atmosphere announce that the upper stratum of the sea has cooled to the same temperature, and a sheet of ice spreads quickly over the smooth expanse, and during a single night oftimes attaining the thickness of an inch. The darkness of prolonged winter now broods over the desolate scene, except when the moon at stated periods, with sickly light, reveals the surrounding horrors. The wretched settlers, covered with a load of bear-skins, remain crowded and immured in their huts, every chink of which they have carefully closed against the piercing external cold; and cowering around the stove, or the lamp, they seek to doze away the tedious night. Their slender stock of provisions, though kept in the same apartment, is often frozen so hard as to be cut with a hatchet. The whole of the inside of the hut becomes lined with a thick crust of ice, and if they happen for an instant to open a window the moisture of the confined air is immediately precipitated in the form of a shower of snow. As the frost continues to penetrate deeper, the rocks are heard at a distance to split with loud explosions. The sleep of death seems to wrap up the scene

in utter and oblivious ruin." At length the sun reappears, and gradually gaining strength, arrests the farther progress of the frost. As he ascends farther and farther up the horizon, daily his power is greatly increased, until the thawing of the ice and snow gives evidence that a milder influence is predominating. At length the ice-bound ocean breaks his fetters and asserts his natural rights. Fields of ice begin to float, and, tost on his bosom, with thundering crash are driven against each other. The same cause, which produced the fogs of the autumn, now covers land and sea again. The lower stratum of the air touching the colder body of water becomes chilled and thence deposits moisture. Hence the atmosphere of Siberia is characterized by being charged with moisture. During the greater part of the year, the more northern latitudes are covered with a dense fog, and a clear sky appears only for a short time during the intense cold of mid-winter. At this season the cold as measured by Mr. Wrangell in January was—65°. Then breathing was difficult, and the immense herds of rein-deer retired to the thickest forests, and, led by instinct, stood motionless as if deprived of life.

Wood's Botany. Crocker & Brewster, Boston, 1845.

No apology need be offered for introducing, at this time, a notice of this work. In a few weeks the earth will be released from her icy fetters, and fragrant flowery Spring will be at the door. Many of our young friends will then be enticed abroad to learn the names, characters, and the relations, affinities and almost endless diversities of the 100,000 species of plants, which clothe the valleys and hill-tops, the plains and mountain sides, and which, in their short-lived beauty, laugh at the glory of man. The members of the Linnaean Association can surely not be indifferent to the claims of a science, which is so largely indebted to him whose name they have assumed, and which claimed from him so much of his time and interest. They, together with many others of our young friends elsewhere, will therefore no doubt be anxious to be prepared to prosecute the study of Botany with vigor, as the Spring opens, and to be furnished with the proper helps to do so successfully. Learners, in this branch of science, lose the most favorable time for beginning, if they defer it to the middle of summer, and, after the novelty has in a measure worn off, they soon become perplexed and discouraged, if they are not provided with a good manual.

The work before us is, in our opinion, just such a one as the wants and circumstances of students in Academies and Colleges demand.—Within the last few years there has not been a lack of books called Man-

uals and Class-books of botany, but, though some of them possessed considerable merit, there was scarcely one of them, which was adapted to the wants of those who wished to pursue the study of the science intelligently. The larger number of them were too elementary, not to say puerile, to be placed in the hands of intelligent youth, and the remainder were only adapted to the wants of the advanced student.—The work, prepared by Alphonso Wood, has the merit of occupying a middle ground; or perhaps it is but just to say that, whilst it is sufficiently elementary for beginners, it commends itself no less to the attention of those who have made no mean progress in the science.

The work consists of two parts; viz: *The elements of Botanical Science; and the Natural Orders, illustratedby a Flora of the Northern United States.*

In the first part are contained brief, but clear descriptions of the elementary organs, of the primary divisions of the vegetable kingdom, and of the general physiology of the structure and functions of the different parts of plants.

The second part, which contains the Flora arranged according to the Natural System, is preceded by a most admirable synoptic table of the Linnaean Artificial Classes. It is well known to those, who have directed their attention to the subject, that, without an acquaintance with a considerable number of individuals in the vegetable world, it is almost impossible for the student to use, with any advantage, the arrangement according to the Natural System. This acquaintance the Artificial System of Linnaeus is well adapted to afford with ease and certainty. By means of this table the student may, if he desires to do so, at once refer his plant to the Natural Order to which it belongs, and there study it in connection with its congeners and affiliated species. One of the great merits of this synoptic table as well as of those, which the author has inserted at various points in the body of the Flora, is that the process of finding the genus of a plant is thrown into a series of dilemmas, which may be answered by yea or nay.

"The Flora comprehends all the Phaenogamous plants, with the ferns, &c. which have hitherto been discovered, and described as indigenous to the New England States and New York, together with the naturalized exotics, and those which are more generally cultivated, either as useful or ornamental." But though it was prepared to suit the Northern United States, it is scarcely less adapted to Pennsylvania and Maryland, most of the plants belonging to those States being also therein described.

We would therefore recommend Wood's Botany to students as a work of great merit, and as one better adapted to their wants than any other that we know.

Monies received for the 2nd. Vol. of the Journal.

G. A. Shriver, Littlestown,	paid in full.	
G. W. Fierstein, Lebanon Co. Pa.	"	
G. T. Capp, " "	"	
J. Wolfersberger, " "	"	
M. Bolton, " "	"	
B. B. Albert, " "	"	
J. Seiler, M. D. Dauphin Co	"	
J. B. E. Albright, Philadelphia.	"	
J. B. Kern, M. D. Baumstown,	"	
J. F. Baum, M. D. Brumfieldsville,	"	
S. L. Boyer, "	"	
Isaac Reed, Franklin Co. Pa.	"	
S. & J. Groseclose, Smyth Co. Va.	"	
Miss Sarah Whitworth, Baltimore,	"	
John Morris, "	"	
Frederick Waesche. "	"	
Rev. C. P. Krauth, Jr. "	"	
Rev. J. A. Brown, Wythe Co. Va	"	
Rev. J. Albert, Hanover. Pa.	"	
J. B. Bittinger, " "	"	
Israel Diehl, Oxford. "	"	
Rev. A. Height, Mifflin Co. Pa.	"	
Edward C. Herrick, New Haven, Ct.	"	
John Hoshour, York Co. Pa.	"	
Josiah V. Hoshour, "	"	2 copies.
Rev. A. Berg, "	"	
James Gerry, "	"	
Rev. L. T. Williams, Franklin Co.	"	
Rev. S. Sentman, Taneytown, Md.	"	
Joseph Baugher, Fountaindale,	"	
Rev. J. V. E. Thorn, Carlisle, Pa.	"	
Rev. S. Yerkes, Cockeysville, Md.	"	
Jas. C. McGuire, Washington, D. C.	"	including 1st vol.
W. L. Peiper, Harrisburg. Pa.	"	
J. M. Eyster, "	"	
M. Zimmerman. Gettysburg,	"	
W. M. Baum, "	"	
L. C. Groseclose, "	"	
W. A. Huber, "	"	
T. W. Corbet, "	"	
C. Diehl, "	"	
Prof. M. L. Stover, "	"	
J. A. Hiestand, "	"	
A. Baugh, "	"	
F. W. Brauns, "	"	
J. Huntzinger, "	"	
D. Hill, "	"	
M. Shaeffer, "	"	
Rev. C. P. Krauth, D.D. "	"	
Geo. Maund, "	"	
E. Henry, "	"	
Jacob M. Bickel, Wheeling, Va.	"	
Jaseph M. Lybrand, Camden, N. J.	"	

To Subscribers.—With this number, we commence the publication of the names of those subscribers, who have paid for the 2nd. Vol. of the Journal. We would be glad, if we were able to publish in the March No. a long list of receipts, as we are greatly in need of money to pay the printer.

To those who are in arrears for the 1st. Vol. we will send bills, hoping they may find it convenient to answer our call very soon.

Pennsylvania College, Gettysburg, Pa.

FACULTY AND INSTRUCTORS.

Rev. C. P. Krauth, D. D.—*Pres't and Prof. of Ev. of Christ., Moral Philos'y, &c.*
Rev. H. L. Baugher, A. M.—*Prof. of Greek Language, Rhetoric, &c.*
Rev. M. Jacobs, A. M.—*Prof. of Mathematics, Chemistry and Mechanical Philos.*
Rev. W. M. Reynolds, A. M.—*Prof. of Latin, Mental Philosophy, &c.*
M. L. Stoever, A. M.—*Prof. of History and Principal of Preparatory Department.*
Rev. Chas. A. Hay, A. M.—*Prof. of German Language and Literature.*
Herman Haupt, A. M.—*Professor of Mathematics.*
W. H. Harrison.—*Assistant Prof. of Languages.*
David Gilbert, M. D.—*Lecturer on Anatomy and Physiology.*
Rev. J. G. Morris, D. D.—*Lecturer on Zoology.*
Mr. W. A. Renshaw.—*Tutor.*
Mr. A. Essick.—*Teacher of Writing.*

Pennsylvania College has now been chartered about fourteen years. During this time its progress has been such as to gratify the most sanguine expectations of its friends. The course of studies is as extensive and substantial as that of any Institution in the Country. The *Preparatory Department* provides for instruction in all the branches of a thorough English, business education, in addition to the elements of the Mathematics and Classical Literature. The *College Course* is arranged in the four classes usual in the Institutions of this country.

The government of the students is as energetic as their circumstances seem to require. They attend at least two recitations a day, Church and Bible Class on the Sabbath, and are visited in their rooms so frequently as to preclude the danger of any great irregularities. It is believed no Institution in the United States has more exemplary young men in connexion with it. They are all required to lodge in the College Edifice, special cases excepted.

The annual expenses are—for board, tuition and room-rent, during the winter session, $61 87½: for the summer session, $41 87½. Washing, $10 00; and Wood, $3 00. Total expense, $116 75. Boarding can be obtained in town at $1 25 per week.

There are two vacations in the year, commencing on the third Thursdays of April and September, each of five weeks continuance.

Acknowledgements of Donations to the Cabinet of the Linnæan Association of Pennsylvania College.

February, 1846. From *J. G. Morris, D. D.* Pres't. of Lin. Soc. 12 species of European minerals.

2 From do. Bradypus? (*Sloth?*)
3 From do. Dasypus novemcinctus. (*Nine-banded Armadillo.*)
4 From do. Sciurus hudsonius, (*Chickaree.*)
5 From do. Mus decumanus.
6 From do. Mus musculus.
7 From do. 41 species of foreign shells.
8 From do. Ignana taberculata.
9 From do. 35 perched American birds.
10 From *Mr. Conrad Weaver*, 14 coins.
11 From ——— York, Pa. per *R. G. M'Creary, Esq.*, specimens of minerals.
12 From *Rev. S. Sentman*, 9 valuable coins.
13 From *G. A. Nixdorff*, 1 coin.
14 From *Prof. M. L. Stoever*, an ammonite and minerals.

VOLUME II.] [NUMBER 5.

THE

LITERARY RECORD AND JOURNAL

Of the Linnæan Association of Pennsylvania College.

MARCH, 1846.

CONDUCTED

By a Committee of the Association.

CONTENTS.

1½ sheet, periodical—Postage, 2½ cents, to any distance within the Union.

NEINSTEDT, PRINTER, GETTYSBURG.

THE LITERARY

RECORD AND JOURNAL

OF THE LINNÆAN ASSOCIATION OF PENNSYLVANIA COLLEGE.

VOL. II. MARCH, 1846. No. 5.

ASTRÆA REDUX. *(The New Planet.)*

BY S. W. MIFFLIN.

The last arrival from Europe brings intelligence of the discovery of a new Planet by Prof. Hencke of Driessen in Saxony.

This interesting discovery, says the Liverpool Mercury, was made on the 8th of December, 1845, at 8 o'clock in the evening; the planet's right ascension, at the time, being 65° 25′ 00″, and north declination 12° 41′ 00″.

"With the politeness that belongs to a true votary of science, Prof. Hencke left the name to be determined by his illustrious friend and fellow student Prof. Enke of Berlin, who has called the planet "ASTRÆA." Each of the select goddesses, Ceres, Pallas, Juno, Vesta, Diana, and Venus, had already their planet, and who so worthy as *Astræa*, the goddess of Justice, the daughter of Jupiter and of Themis, and the goddess of Fore-knowledge and Celestial Augury.

There is good augury in the words Astræa Redux; her return well deserves three cheers, as proposed by Prof. Schumacher, in his letter to Sir James South. May she never again leave the world."

The elements of the orbit have since been calculated by Prof. Enke, and are as follows.

Mean Longitude at Epoch Jan. 0. '846,	89°	32′	12.″1
Perihelion,	214	53	7.0
Ascending Node,	119	41	37.5
Inclination,	7	42	8·4
Daily Heliocentric motion,			827.″65
Mean Distance from Sun or Semi-axis, that of the Earth being 1,			2.6390
Eccentricity (in parts of Semi-axis,)			0.207993
Revolution,			1565 days.

These elements sufficiently stamp her as a member of that interesting family circulating between the orbits of Mars and Jupiter, of which

Ceres, Pallas, Juno and Vesta have been heretofore the only known members.

By the distance from the Sun and her periodic time, she seems as intimately connected with Juno, as Ceres and Pallas are with each other. Their periods differing but 28 days, and their distances 0.03, as the eccentricities of their orbits are considerable and very nearly equal, while their perihelions lie in opposite regions of the heavens, it follows that their orbits cross each other in nearly opposite points, to wit: in Leo and Aquarius.

The intersection of orbits is not, however, peculiar to these two planets, but is common to all the members of this family, each of which, in its annual revolution, crosses the orbit of one or more of the rest; and here I cannot help noticing an error, which has crept into that very interesting and popular work, Dr. Dick's Celestial Scenery.

The exceptionable passage is as follows:

"Juno is further from the Sun in her aphelion, than Ceres in the same point of her orbit; and Vesta is further from the sun in her aphelion, than either Juno, Ceres or Pallas, at their perihelions. The perihelion distance of Vesta is greater than that of Juno or Pallas. Hence Vesta may sometimes be at a greater distance from the sun, than either of the other three, though her mean distance is less than that of either, by millions of miles, so that the orbit of Vesta crosses the orbits of all the other three; therefore, it is a possible circumstance, that a collision may take place between Vesta and either of the other three, should they happen to meet at the intersection of their orbits."

The facts stated by Dr. Dick are correct, but the inference in respect to the intersection of orbits is only true in the cases of Juno and Pallas. But because the greater axis of Vesta's orbit lies nearly at right angles with that of Ceres, it will not do to compare her aphelion distance with the perihelion distance of Ceres, the true comparison lying between the aphelion distance of Vesta and the mean distance of Ceres, the latter of which distances is considerably the greater; and hence, though the two orbits approach very nearly in long. 90° to 100°, they do not cross; but that of Vesta remains within that of Ceres throughout their entire revolutions.

This is the only exception to the fact, that the orbit of each of these new planets crosses the orbits of all the rest. The intersections of Astræa and Juno have been noticed, that of Astræa and Pallas likewise take place in nearly opposite points in sign 6 and 12.

Astræa likewise crosses the orbit of Ceres in about long. 5° and 115°, and though her mean distance from the sun is greater than Vesta's by

many millions of miles, while her perihelion lies in the same quarter of the Heavens, yet, by reason of her greater eccentricity, her orbit runs within that of Vesta, from about long. 170° to 250°, nearly one-fourth of her whole circuit.

This intersection of orbits must however be understood with some allowance. If they all lie in the same plane, the intersection would be absolute; and if two planets should arrive at an intersection at the same time a collision must take place; but since no two orbits lie in the same plane, their intersection with each other, considered as lines, can be true only in the possible case of the points of intersection falling upon the line, in which the planes of the orbits intersect. In all other cases the two planets, though apparently occupying the same point when viewed in a line perpendicular to the plane bisecting the angle of intersection of their orbits, will still be separated by an interval equal, at least, to the difference of their latitudes. In the case of Astræa, there seems to be no danger of collision; her latitude appears to differ not less than one degree from that of all the others, at the point of intersection, and in the cases mentioned by Dr. Dick, the difference of latitudes is still greater; nor does there appear, from a careful comparison of their elements, any probability of any pair of these bodies coming in actual contact, though there is a bare possibility of so near an approach as to convert the smaller of the two into a satellite of the larger.

It is as well to remark, that the orbit of Astræa agrees with the supposition of a common point of re-union among all the different fragments of the large planet from which these smaller ones have been supposed to have been severed. The nearest approach of all the orbits being in the long. 150°, where the orbits of Ceres and Juno intersect that of Pallas, lying within, at a distance 0.4., while Astræa and Vesta lie close together, about midway of the above distance.

Since writing the above, I have examined Kendall's Uranography, in which the intersections of Vesta's orbit are correctly described.

PALÆONTOLOGY, OR FOSSIL REMAINS.

There are many natural phenomena, which either excite the admiration of men by their brilliancy, or strike them with terror by their disastrous effects. There are others, on the contrary, which, not less full of interest and not less worthy of investigation, have yet, for a long time, remained unobserved, because there is nothing about them calculated to attract the attention of the crowd. *Fossil remains* belong to this latter class, and although they are connected with the most interesting and

important questions in the natural sciences, yet for many ages they had been almost entirely overlooked by naturalists. Fossils, in fact, have very little about them to excite the interest of superficial observers. Buried in the depths of the earth, without color, often mutilated and even fragmentary, they do not captivate the eye as do the brilliant productions of animated nature. But the most intense interest is awakened in the inquiring mind, when it begins to reflect on the manner in which the fossils have been deposited; what is the mysterious agency which has placed marine shell at a great distance from the sea, in the midst of the hardest rock, and even on the summits of the highest mountains? and what was the character of the animals, whose fossilized remains attest modes of existence and forms so different from those which live at the present time? Such reflections create a powerful interest; for these phenomenon are closely connected with the history of our globe.

In the writings of the philosophers and naturalists of antiquity, we find a few passages, which show that the most general facts of the history of fossils had not entirely escaped them. Plato and Pythagoras, and especially Aristotle, Pliny and Seneca, make mention of them, and even the imagination of some poets was kindled by them, for Ovid speaks of marine fossils being found on the tops of mountains.

But no naturalist of antiquity investigated fossils, and even to the end of the fifteenth century of the christian era, we find the opinions of men, on these phenomena, vague, crude, and erroneous.

At the beginning of the sixteenth century, the discovery of numerous fossils, drew the attention of some learned men, who tried to account for their occurrence on the mountains and their distance from the sea. But these facts were so difficult of solution, and the presence of these remains was considered so incompatible with physical laws, that they denied that these *figured stones*, as they were called, were the veritable remains of animals, and they attributed their formation to the sports of nature. Other learned men thought that the occult or mysterious plastic power *(nisus formationis)*, to which spontaneous generation was attributed in that age, could also create the forms of shells in stones. Others (equally wise) thought that these fossils were the product of the seed of the animal, drawn up by evaporation or carried away by currents. They supposed that the terrestrial animals, and especially the marine, deposited their germs, which, transported by the water in subterranean conduits, were thus carried far into the interior of mountains. These germs there found places favorable to their developement; in their growth they preserved the form of their parents, and imbibed the substance of the rock where they had been deposited!!

At length some geologists, and Bertrand in particular, conceived a more simple idea than the preceding, and held that these "figured stones" dated from the first creation, and had been formed together with crystals at the same time that the mountains and all other created bodies were brought into being.

These diverse theories were not destined to survive. About the beginning of the sixteenth century, they were attacked by naturalists, who recognized in these fossils the veritable remains of animals which had lived in epochs anterior to our own. Timidly at first, but more boldly afterwards, some foresighted men dared to suggest the idea that the "figured stones," ages ago, had life, and had been deposited by water in the strata in which they are now found. The idea was violently assailed, and even by men, who had rendered themselves illustrious in anatomical and physiological investigations. Thus Fallope, for instance, held that fossils shells were the result of subterranean fermentation, and that the elephants' tusks found in Italy, were nothing else than earthy concretions. But the true theory, that they were deposited by water, at length gained the ascendency.

This point being established, immense difficulties still presented themselves to find an explanation of the flow of the water of the sea over the mountains and the present continents. The idea maintained by most of the learned men of the second half of the seventeenth century was, that fossils were the monuments of the Noachic deluge, and had been transported from their original *habitats*, when the waters were raised over the tops of the highest mountains.

Unfortunately at this period, the theologians believed that religion was attacked by the geological theories. In the sixteenth century, the men, who held that fossils were really the remains of animals, were regarded as enemies of the Scriptures, because their views seemed to be opposed to the order of creation as given by Moses. In the seventeenth century, on the other hand, theology was reconciled to this idea, because it saw in this theory a proof of the biblical deluge, but still those men were considered profane rejectors of the Scripture, who hesitated about explaining all these phenomena by a single universal deluge, and who held that these deposits were made at different epochs, and that the crust of the earth had endured frequent disruptions, which displaced or upheaved the strata formed at the bottom of the seas. These accusations contributed much to arrest the progress of the science, and an entire age was lost in vain hyphtheses and sterile debates.

Scilla, an Italian painter of natural history, may perhaps be considered as one of the first founders of the *diluvial theory*. After him, some

other authors developed it, by hypotheses more or less ingenious, but nearly all far enough removed from the truth, and thus the onward march of the science was retarded. Among these authors, we may cite Burnet, who, in a work styled by Buffon a beautiful historical romance, explained the whole history of the globe from Paradise to the Millenium, and Whiston, who made the comets play an important part in the attraction and displacement of the waters.

The theory of the transport of all fossils by the Noachic deluge presented too many strong objections not to have been attacked from its origin, although this opposition brought the objections in conflict with the theologians. At that time, the strong proofs, capable of demonstration at the present day, that the present state of tne earth was occasioned by a continuous series of changes in the form of continents and limitations of seas, were not known. Nevertheless, the facts which were inexplicable by a single inundation were so numerous, and striking, that they occurred to many naturalists. The variety in the position of fossils, their occurrence in the hardest rocks and even in the interior of mountains, the perpendicularity of many strata, and numerous other facts, are so incompatible with a single cataclysm, that was sudden and of short duration, that rather than admit a theory which presented such strong objections, some learned men were induced to go back and doubt the reality of fossils, and regarded them as *lusus naturæ*.

But other authors more enlightened sought to substitute for this theory something more rational. Stenon in 1669, and Hooke in 1688, showed that fossils had necessarily been deposited at the bottom of waters and in horizontal strata, and that subsequently these strata had been elevated, inclined or disrupted by convulsions of the earth or the disengagement of subterranean gases. Ray, Moro, Gessner, &c. also maintained and developed this idea, to which Buffon lent the aid of his admirable style. Although the geological theories of Buffon are a mixture of true ideas and false opinions, the popularity of his works contributed much to advance the science, in compelling men generally to abandon the diluvial theory.

The subsequent progress of Palæontology shall be treated in our next number. J. G. M.

EXPLORING NATURALISTS.

To the lover of nature,—one whose avocations imprison him for a portion of the year within the four walls of a college, a counting house, or some other den or place of duty and of daily toil—nothing is more

delightful than the anticipation of vacation time, or a coming period of suspended labor. The freedom obtained is used at once to place him in communion with the wild haunts of birds and animals, and to surround himself with the wild forest, where he can hear the refreshing murmur of the wind, as it breathes through the lofty tree tops. It begets impatience in such an one, when, during the frigid season, he reads the memoirs of the wandering naturalist, and of his exploits in collecting and observing, as of our Dr. Godman or the more celebrated Gilbert White. But the investing garment of snow will not melt at a breath from the soil, nor will the ice flow away from the river, that the earth may open out its treasures of life to his eager contemplation. Winter is the season for study—identify or describe the materials you may already have gathered—and if time serve, plan an expedition for the opening year. Carefully consider and decide upon the place you propose to visit, the object of your pursuit and study, the note book, instruments for observation, and other needful appliances, which may be required, and above all learn well, from all accessible sources, what others have done on the same ground before you, or you may chance to make discoveries, which will prove to be any thing but new.

To the unaccustomed disciple of Linnæus nothing is easier than to get into a scrape, when impelled by an overflowing enthusiasm with very little discretion. Released from work and with a day before him, like one possessed, he rushes forth into the suburbs, becomes at once guilty of extravagance in feats of walking against time; he crosses this farmers wheat field, and another's rye, and is pursued and hallooed at by men, dogs and horses. He becomes entangled in marshy or swampy places, where the tall trees over-arching shut out the sun, and the brush and brambles, right and left, before and behind, obstruct his progress in any direction: he becomes filled with wonder how he ever got in, and how he will get out. A snake under his feet hisses at him as his eyes are directed upwards at a bird's nest, or a lizzard streaks along a fence rail, under which he is disenterring some snails. He ploughs the shallow stream, with denuded extermities, up and down its centre, to find out the lurking habits of nudibanchiate mollusks, and goes home with a bad cough and sore throat, for which his wife prescribes stopping at home and Sherman's Lozenges. Once more, he has a capital chance of studying the eternal town-view out of his sick room window, or the familiar figure on the papered wall.

Avoid all these awkward catastrophies, by reflection before hand as to whither you would go and what for. Mishaps of this description may spoil the forthcoming of a zealous naturalist. An old stager in

the forest, however, would think himself in very select and welcome company, if other and more foreboding animals, besides those above named, came out to salute him, or even if, as Ben Johnson says:

> "The owl is abroad the bat and the toad,
> And so is the cat-a-mountain,
> The ant and the mole sit both in a hole,
> And the frog peeps out of the fountain."

No Linnæan can contemplate that scene, in the life of the ornithologist Wilson, when he steps alone into his little canoe, for a long voyage down the "*Belle Riviere*," without feeling the deep romance of his situation. This was an adventure beyond the daring of our cabinet naturalists. It looked like making that, which most persons regard as the fitting trifles of an hour's leisure, the serious business of his life. It was attended with an uncomfortable uncertainty of the shelter of home, of the food and couch ready prepared at the going down of the sun. No supper bell rang in his ears, and the ripple of the swelling flood rocked him in slumber. But a great mind, full of other things, consents to withstand these chances, always looking to the end. It despises these longings for comfort, throws away the impertinent suggestions of animal ease with a "get thee behind me Satan." The future filled up Wilson's store of hope; and in his mind's picture of it, there stood forth a row of Quarto Volumes of Letter press and colored plates of the brilliant birds of America. Of such as these, often fatal "*ignes fatui*," are the seductions, which drag the naturalist over bogs, across rivers, over the mountain side, and eke the mountain billow. But Wilson survived his adventures, and came to possess the land he had seen from "the top of Pisgah."

The spirit of exploring travel comes upon us early in life, when yet we are wanting in the sober capability of judging the question of expediency and profit. The lust of the eye to behold strange places and people is to be gratified, and the excitement from the perils of travel are yearned after, taking many a foolish lad to sea to the annoyance and distress of parents. What else urged Walter Scott, yet a youth, to perform his "raids" among the highlands. This too, prompted Linnæus, Pallas, Humbolt, Le Vaillant, Waterton and scores of other men to search other lands, when wearied with conning over, so often, the surroundings of their own. Their occupation, when *en route*, seems to have been an after thought.

With reference to natural history, this spirit of travel arranges those, who pursue it fully, into two classes, the cabinet and the field naturalists. With the former this essay proposes to have but little to do; and

as our reader, by this time, may begin to wonder with *what* it *has* to do, it may be proper to state, that we propose to close this present chapter here, making it an introduction for some instructions to those, who may be planning an expedition against the wild tribes of nature, and, as the title of Laws of Congress often recites with a broad meaning, "for other purposes." F.

LE VAILLANT'S OSPREY.

The following story, told by Le Vaillant in a foot note to his *Oiseaux D'Afrique*, appeared to be so characteristic, whilst reading it over the other day, that we were induced to give it a rough transfusion into English, and offer it to the Record: He says:

"Whilst walking on the extended common, near Genevilliers near the suburbs of Paris, I was witness to a combat between a half score of thrushes, and an eagle, whose species is the osprey, *ossifraga* of the ancients. Completely beaten, vanquished, he took refuge in a thicket, where he squatted down near a stump. Attracted by the repeated cries and unceasing flutter among the thrushes, whose motions announced something extraordinary, I approached and was astonished to find, that it was an eagle with which they had to deal. Having no gun with me, aware that I was encroaching upon the limits of the royal chase, still unable to resist so fine an occasion of procuring a bird, which my collection yet wanted, I ran home, my dwelling at that time being at Asnieres, a village situated near the place of which I speak. I provided myself with a pistol loaded with a large ball—a gun would have exposed me too much—and, regaining the common, I reached the thicket which contained the object of my desires, where I found my eagle still a prisoner to the thrushes, which had not relaxed their guard in the slightest manner. There, braving the jealous ear of the inflexible patrol, and the atrociously exclusive game laws, my heart beating with fear and inquietude, I approached the feathered poltroon within ten paces, and, with a well adjusted aim, I fired upon the spot. Immediately burying my pistol, and concealing my eagle among the bushes, I sallied out of the enclosure which contained my treasure. With eager eye, I looked around, and every man I perceived sauntering over the common or upon the road appeared to me to be crossed with the fearful shoulder belt embroidered with *fleurs de lis*. But for once, the vigilance of the guard was at fault. Seeing nothing which could cause me uneasiness, I wrapped up my prize, and stealthily gained my apartment, where, elated with my conquest, I called my neighbors in to be witness of my triumph. This eagle still

forms a part of my collection. Although this exploit was much excelled by many, which befel me in after life, especially when I killed my first Giraffe, I remember distinctly that, at the time, I felt no less pleasure. Thus it is, that in our life, every thing is of relative importance. An eagle, killed near Paris, was at that time an epoch of absorbing interest to me, perhaps more extraordinary than the subsequent one of shooting a camelopard in the deserts of Africa. The one was a giant among the birds of Europe, so the other was also among the quadrupeds of its own country." F.

THE SEA-SERPENT IN NORWAY.

It is not the complaint but the jest of foreigners, that the inhabitants of the United States have a preposterous idea of superiority to the rest of the world, whether in intellectual and moral attainments, or in the possession of natural objects on a grander scale than elsewhere. To hear ourselves talk, we might suppose that lofty mountains, stupendous cataracts, broad rivers, tall trees, and gigantic men, occurred no where but in this favored land. Yankee ingenuity is proverbial amongst ourselves; our skill in handling the rifle is a theme of national exultation, while, in the art of drawing the long bow, we are above competition. To our mortification we occasionally find however, that others can invent ingenious machines; that the eye of a quadruped can be picked out, at a considerable distance by European hunters; and that wondrous feats are to be found recorded in extra American literature. Even in gigantic monsters, recent or fossil, we have no exclusive property. The Bison is represented by the European Boassus; our Mastodon by the Mammoth; our Hydrarchos by the Iguanodon, or, according to some, by the great African snake, which attacked the army of Regulus; and finally our much boasted Sea-serpent has its match in one of a similar nature on the coast of Norway. Various accounts of this animal are scattered through the narratives of northern travelers and naturalists; that of good old Bishop Pontoppidan (*Norges naturlige historie af Erich Pontoppidan*, 2 *Deel*, *p.* 317) is probably known to most of our readers. We shall not discuss here the question of the actual existence or identity of these two great "snakes;" but merely translate for our readers some information, which Dr. H. Boie, a naturalist of the very highest eminence and authority, collected on this subject, while on a tour through Norway, in 1817.

"It was very interesting to us, to learn at North Herroe, that an inhabitant of the island, (our subsequent guide to Tiotoe), had only four-

teen days before, seen the much talked of Sea-serpent, an animal of whose existence the majority of the people in this region doubt as little now, as in the time of Pontoppidan, at the same time that even the credulous multitude ridicules the ideas of Krakens, Mermen, and Mermaids. Even before we arrived here, two peasants, and an educated and intelligent man, the father-in-law of the preacher at Hemnes, had assured us, that they had recently seen it with their own eyes, and our North Herroer, who was quite offended when we made him repeat his account several times, gave us the same description of its appearance, which Pontoppidan had written down from the mouth of M. de Terry, attested by the oaths of several other spectators. 'During a perfect calm of the sea,' he told us, 'an animal, about eighty feet long, with a smooth head, and a kind of mane on the anterior part of its body, had risen to the surface of the water, not fifty fathoms from his boat. On observing him, it hastened to disappear, moving with considerable rapidity, during which, now one part of its body and now another projected above the water.' We were fully convinced by the good sense and simplicity of this man; and it appears highly probably that an undescribed animal, of very considerable size, at the present time inhabits the depths of the Northern seas, however much, what has been written from hurried and anxious observation, may be mixed with fable. Whales and Dolphins are objects, of quite too every-day occurrence to the inhabitants of the North, to be mistaken by them."

(F. Boie, Tagebuch gehalten auf einer Reise durch Norwegen, im Jahre 1817, p. 315.)

S. F. B.

AN INTRODUCTION TO THE NATURAL HISTORY OF LEPIDOPTEROUS INSECTS.

From the French of Boisduval.

The growth of caterpillars is more or less rapid according to the race, and varies with the nature of their food and the season of the year. Those, that live upon succulent plants, grow much more rapidly than those which feed upon grass or lichens. There are a great many that eat only during the night and lie quiet all day, whilst others eat so voraciously as to attain their full growth in the course of five days. M. Vaudoner of Nantes has discovered that the caterpillars of the *Argynnis dia* and *euphrosyne* frequently remain in a torpid state during the summer and winter, and change to the perfect insect only in the following spring, though some also undergo this change towards the close of August.

Most caterpillars live singly upon the particular plant which supplies their nourishment, but some species, especially the Bombycidae, live in societies or families more or less numerous. In the latter case they are all the offspring of the same insect which has deposited its eggs in one place, and, when the young come forth, they live there in a kind of nest or tent which affords them a common shelter. Some, whose organization is so delicate that they cannot endure contact with the external air, fabricate a kind of case or garment of silk, which invests them so that they only expose their head when feeding, and in this they undergo their changes.

With the exception of a great number of Tineidae, which live at the expense of our furs, our wollen stuffs, upon skins and upon fatty substances, all catterpillars feed upon vegetable substances, and from the grape to grains nothing escapes them, though most insects prefer feeding upon green leaves. Next to these they prefer flowers. Plants the most acrid and the most poisonous, such as the Euphorbias and Aconite, are as eagerly eaten as the most insipid.

For a long time it was believed that every species of plant nourished its peculiar species of caterpillar, but that error is now confined to those utterly unacquainted with entomology. The same species sometimes lives upon twenty different trees, and the same tree sometimes nourishes more than fifty different species of caterpillars; thus, for instance, the *Lacquey* caterpillars feed upon fruit and forest trees indiscriminately. But whilst caterpillars are generally polyphagous, yet in a great many cases they are intimately related to particular vegetables: we find certain genera or certain groups of lepidopterous insects corresponding to certain families of plants. Whilst we know of no plant that is not attacked by insects in its native place, there are yet numerous instances in which plants transported to another region entirely escape these ravages. Thus a great many exotic trees transported to Europe remain uninjured, though frequently stript of their leaves in their native soil. But if a tree belongs to a genus found in the country to which it has been transferred, it enjoys no such exemption. Thus all the poplars and willows brought from North America are subject to the same attacks as our indigenous trees of a similar nature.

The Chrysalis state.

When the caterpillar has reached its full size, it ceases to eat, as it did when about to moult, it draws itself together, changes its color and becomes of a dull, livid hue: if it is of a gibbous form its lumps are absorbed and disappear, and, after having found a suitable retreat, it throws

off its skin and passes into the *chrysalis* state. In that state intermediate between the caterpillar and the butterfly, its form is entirely changed, and does not in the least resemble that which it was just before. It is a being that scarcely respires, deprived of every organ for taking nourishment, and immovable as the seed of a plant. However, if we examine it at a particular period, we can see through its envelope some parts of the butterfly, which fills it and seems to be wrapped up like an infant. It is for this reason, that some naturalists have given the name of *pupa* to the nymphs of lepidopters, in allusion to that enwrapment; but that of *chrysalis* has prevailed, though not applicable in most cases.

Some chrysalids are cylindrico-conical, others angular, but their general form is at the same time more or less conical.

In chrysalids we distinguish the envelope of the abdomen, composed of nine segments or rings corresponding to those in the body of the perfect insect: the envelope of the head embracing the eyes, the antennæ and the tongue, each of which is enclosed in a separate case; the envelope of the thorax; the envelope of the breast and legs, and finally that of the wings. The posterior extremity of chrysalids is generally armed with a single or double point, sometimes bent back in a hook, or furnished with threads or loops of silk.

Chrysalids of Heterocerata are generally brown or reddish with all the intermediate tints, those of Rhopalocerata vary more in their hues, and are often ornamented in the most brilliant manner. Some are of a yellowish green, others white enamelled with black: some have spots or bands of burnished gold, others are spotted with silver. These golden colors, which were for a long time regarded as real gold, originated the name *chrysalid* (χρυσος=gold,) which has now been extended to the nymphs of all Lepidopters.

In most chrysalids the rings of the abdomen are movable upon one another, and this is the only sign of life which some of them give when they are touched. Others have the power of locomotion. Those that live in trees and underground, warned by a wonderful instinct that the delicate parts of the new insect, about to be developed from them, would be injured in the place where they have been reposing, manage to crawl from it and even ascend trees in order to reach a suitable place for the transformation which they are about to undergo. Those, that mount trees, do it by means of the small hooks which are upon their abdominal segments, those in the earth ascend by the movement of their abdominal rings which are contracted and dilated until the insect gradually breaks through the earth by which it is covered.

The duration of the chrysalis state varies greatly according to the

race. Generally the smaller species terminate it much sooner than the larger, but there are many exceptions to this. This has been explained by the transpiration which is necessary before a chrysalid can arrive at maturity, and by the evaporation of the fluids, which is performed much sooner in the small than in the large chrysalids. This has been proved to be a fact by Reaumer, who retarded the exclusion of the insect by keeping the chrysalis in ice, and hastened it by the application of heat. But we do not yet know why, of the same brood, under the same circumstances, so far as appears, some chrysalids go through their changes much more speedily than others.

The mode in which caterpillars change into chrysalids also varies according to the race. Some, as that commonly called the *silk-worm*, spin cocoons to envelope the chrysalid, whilst others, as the great mass of the Rhopalocerata, are entirely naked. The latter have three different modes of performing their metamorphosis, and it is upon these that our nomenclature is partly based. In some, which we call *succincti*, (succinct,) the chrysalis is fastened by the tail end and by a transverse band in the form of a girdle, at every variety of inclination; such are the *Papilio*, *Picris*, &c. In others, which we call *suspensi*, (suspense,) it is pendant and only fastened by the tail, as in the *Vanessa*, *Satyrus*, &c. In the third class, which we term *involuti*, (involute) it is rolled up in leaves or in a thin web, protected externally by a number of transverse threads.

The Heterocerata have two principal modes of passing into the chrysalis state; some penetrate into the earth, others fabricate their cocoons upon its surface. There is nothing more wonderful or more varied than the instinct, we might say the intelligence, which these caterpillars display in securing and defending themselves against their enemies. The cocoon of the *silk-worm* is undoubtedly one of the most interesting in respect to its use to us, but others are fabricated in a much more remarkable form.

When the period of its exclusion, or as it might be termed, resurrection, has arrived, the chrysalis changes its color, becomes soft and transparent, and sometimes shows through the cases of the wings the design and colors of the butterfly. The efforts of the prisoner split it longitudinally at the thorax; the opening is speedily enlarged and it comes forth with perfect ease. But when the chrysalis is confined in a hard and coriaceous cocoon, as that of certain *Bombyces*, &c. or in a cocoon of pure silk, the gates of another prison must be opened. For this operation the means vary with the race. In some the instinct of the caterpillar has foreseen these obstacles, and everything is found arranged in a most wonderful manner for the moment of the metamorphosis; for example.

the caterpillar of the *Nonagria paludicola*, which lives in the stubble of the *arundo phragmites*, makes internally a circular opening in one of the sides of the stalk, being careful to preserve the epidermis. All that the perfect insect has to do in order to get out is to pierce that sort of a membrane. In many *Saturniæ* the cocoon being closed at one end by a network of convergent threads, all that the butterfly has to do is to soften these, which it does by a fluid which it emits, and a passage is then open for its egress; but as these threads are very elastic they sometimes return to their former position, and it is only by its weight that the departure of the chrysalis can be known.

When the butterfly first comes forth from its chrysalis it is very weak; all its parts are soft, without consistence and full of moisture. Its wings are drooping, contracted, and exhibit but little of the figure that they are to have in the course of a few moments. Meanwhile it fixes itself against a branch or against the sides of its cocoon, stretches out each of its organs in succession, making from time to time a slight rustling with its wings, which grow and develope themselves much like the leaves of a tree. When they have acquired their normal size, the insect moves them up and down alternately for the purpose of evaporating the liquid with which they are still saturated, and ordinarily at the end of half an hour they are prepared to fulfill all their functions.

SIBERIA, NO. II.

A remarkable phenomenon called Zeplot weter (warm wind) occurs during this rigorous weather, blowing from S. E. by S. It begins sometime suddenly when the sky is quite clear, and raises the temperature in mid-winter from –47° to 35°; so that the plates of ice, which are substitutes for glass in the windows, begin to melt. It seldom continues longer than twenty-four hours.

Although the climate is one of the most inhospitable in the world, yet it is by no means unhealthy. Here neither scurvy, nor any infectious disease prevails. Catarrhal fever and complaints of the eyes are the principle ailments to which the inhabitants are subject. The former are connected with the thick fogs in October and the beginning of the severe frosts in December; and the latter are caused chiefly by the reflection from the snow, which is so powerful as to require a protector to be worn over them.

An optical illusion, occasioned by the peculiar nature of the atmosphere, similar in many respects to the mirage of the sandy desert, here presents itself: "As we gazed," the narrator informs us, "we thought we

saw the rocks and precipices of the promontory reflected on a smooth surface of open water; but, in a few moments, what had appeared open water seemed changed to a smooth surface of ice, which presently became covered with numerous inequalities varying their form every instant. At last, as the position of the sun was a little altered, the whole disappeared, and we saw clearly an almost impassable range of enormous hammocks extending in every direction." The strong refraction of the rays of light, constantly varying with the relative change of position between the sun and the ice, renders these illusions very frequent; and often they mislead the traveler. Among the ice-bergs of the Arctic Ocean they assume all the fantastic forms that fancy can create; resembling well built and populous cities, with numerous churches and steeples, and again the solitary castle, frowning in lonely grandeur and proud defiance upon the plains beneath.

A more remarkable case of illusion was seen by M. Kosmin, a companion of Mr. Wrangell, in his polar expedition. The sun had been shining constantly during seventy-two hours in a clear and cloudless sky. This was the last day that they saw it in its full magnificence, heightened by the refraction which the great evaporation from the sea produced. The size of its disk and its altitude appeared to vary constantly. One moment it seemed to contract, then to assume an eliptical form and to sink into the ocean. Then it would suddenly rise again in full size and majesty, and float above the horizon in a flood of red or yellow light. This magnificent spectacle continued throughout the day, nor could they refrain from gazing on it notwithstanding the pain which the brilliant light caused to their eyes.

The characteristics of the Aurora Borealis, so common in high latitudes, are well known. But certain facts, ascertained by personal observation in this expedition, should not be overlooked. On one occasion there appeared in the N. E. horizon an insulated grey cloud, during the day, from which white beams streamed to the zenith and across it to the opposite horizon resembling the streams of the Aurora. They continued about one half an hour. Sometimes the Aurora appeared to be nearer to them than the ordinary height of the clouds, but no effect was visible on the compass-needle. When shooting stars fell near the lower portion of an auroral arch fresh kindled streams immediately shot up from the spot where the stars fell. The Aurora is usually near the surface of the earth. This is shown by the visible influence of the lower current of the atmosphere upon its beams. The effect of the wind has been as clearly seen on the streamers as on the clouds, and it is almost always the wind that is blowing at the surface of the earth. It has been supposed that the

freezing of the sea is connected with the appearance of the Auroras, and also that a great quantity of electricity may be produced by the suddenly rising vapors or by the friction of large masses of ice against each other.

Introductory Addresses delivered at the Commencement of the Course of Lectures in the Medical Department of Pennsylvania College, located in the City of Philadelphia. Winter 1845 *and* '46.

These addresses, four in number, have been pronounced worthy of publication, by the gentlemen for whose special benefit they were designed, and we presume that those, into whose hands they fall, will approve their decision. We design to notice two of them in the present number of the Journal; the others will be reserved for another time. The two, to which attention will now be directed, are Dr. Darrach's and Dr. Grant's. The one discusses the vocation of the physician under the guidance of the words of divine inspiration, "Go heal the sick."—The other has more direct reference to the study of Anatomy as a fundamental and indispensable part of medical education. Dr. Darrach, in the first named, sets forth, in a very clear, beautiful, and instructive manner, the noble ends to be gained by science and skill employing the remedial means of medicine in combating morbid action in the animal economy.

With a classification of his ideas sufficiently logical and at the same time comprehensive, he fills up the outline with clear exposition of principles, and an array of illustration, drawn from his own observation in Europe and America, which imparts a high value to his lecture, and carries along the mind in the perusal of it without producing a sense of fatigue. In looking at the medical profession as here presented to our view the high responsibilities which devolve upon it, the important trust commited to it, we are forcibly struck with the conviction that sufficiency for these things must demand a high degree of mental training, and professional study both protracted and profound. We have asked ourselves the question, whether of the many who go forth from our medical schools endorsed by them as qualified for practice, or without the regular endorsement, there are not some who will not heal the sick, but look on the ravage of disease with ignorant gaze, or so meet it with remedies as to hasten, rather than retard the fatal result. Whatever may be the eminence in science of our medical professors, whatever ability and assi-

duity they may display in the inculcation of truth, however laborious they may be in furnishing every necessary illustration, so that instruction may enter by the eye as well as by the ear, we have been apprehensive that in the defective education of many of their pupils, in the want of proper mental developement in some who crowd their rooms, they find an inadequate receptivity for their learned labors. Human life is too valuable to be committed to any other than the most skilled hands, and no one should be willing to take charge of it, but he who feels himself prepared to do what the science of man can do to protect and preserve it. The day, we hope, is not far distant when no one will be admitted as a student in our Medical Colleges and Universities, until he has previously secured the degree of A. B. or an amount of knowledge equivalent to what it imports.

We do not say that no one can make a good physician without a good general education, but we unhesitatingly say that a high standard of literary attainment, and a thorough-professional education drive away from the *corps medical* many an unworthy pretender, and not only elevate the profession, but render invaluable service to the public. Nor should our medical faculties abate one jot or tittle of their requisites for the doctorate. They should give a diploma to no man, they should recommend no man as worthy the degree of M. D., who had not fully come up to their prescribed course. We understand that the Faculty of the Pennsylvania Medical College have acted and have determined to act upon the principles of letting none pass, who fall below their published requisitions. They have determined that their examinations shall be faithful, and they will not become accessory to the evil done to the community by setting their seal upon unworthy men.

We have however, wandered from our subject, we proposed to ourselves to present some extracts from the lecture of Dr. Darrach. The points discussed are 1st. What is sickness? 2d. Who are sick? 3d. Can they be healed? 4th. Who shall heal them. Under the 3d head, we find the following interesting statements: "History shows that, with the progress of Christianity, diseases are alleviated, and cured and prevented. In proof of this position, contrast the disorganization, deformity, and sudden and enormous mortality in Pagan lands from unchecked disease, with the preventions and prompt and easy cures of the most fatal complaints which occur in Christendom. For example, how many weakening paroxysms of intermittent fever, which in heathen lands are permitted to be repeated until they have produced paralysmic tumors and dropsy, have been quickly arrested since the Countess of Cinchon introduced her powder into Europe. How many continued fevers which, in

those benighted nations, are permitted to depress the strength, are soon and safely brought to an artificial crisis, since Sir George Fordyce has established the agency of antimony? How many catarrhs, and instances of catarrhal consumption have now no fatal issue, since Laeunec's practice has been adopted? How shall we duly estimate the instrumentality of Lady Wortly Montague and Jenner? We have no records of the supposed ravages of small pox among the millions of Asia. We can trace it only to the seige of Mecca in the year 572, when it destroyed an invading army. Subsequently it followed the Arabs and Saracens in their successful western expedition, and afflicted Spain, Sicily, Italy, France, and then the entire globe, causing a general mortality of 25 per ct. of the human family. How different now! That once fearful disease is now, by means of inoculation and vaccination, as fearlessly met by a physician as would Franklin the forked lightning with his pointed rod, and Davy, with his safety lamp, the fatal damps of the coal-pits. Nothing, perhaps, can better exemplify the position in question than the following fact. In the year 1837 the small pox broke out in the Eastern State Penitentiary, and only 2 of 80 cases of the disease died, whereas among the Indian tribes of the Rocky mountains attacked with the disease about the same time, scarcely 2 of 80 survived."

Numerous other facts are advanced to show the great power of the healing art—the real advance made by medical science in counteracting the effects of nosopoietic causes.

There is, there has been too much scepticism in the world on this subject. Justice has not been rendered to medical science in the estimate made of it. Empiricism has received entirely too much favor amongst men. It is time that quackery should be banished from Society and that the learned, honorable, and highly useful profession of Medicine should obtain its place high in the respect, and confidence of the community.

We have left but little space for Dr. Grant. Anatomy and Physiology are the topics of the Dr's. lecture. Their importance, their absolute necessity as a part of medical education are clearly shown. They are "at the very foundation of all medical knowledge; neglect them, and empiricism in all its forms and varieties, will be re-enthroned, bringing in its train the folly and absurdity, danger and ruin, which make quackery so hateful and wicked."

There is nothing that has been viewed by us in these lectures with more satisfaction than the high moral tone which pervades them, and the sincere homage which they pay to revealed truth.

Says our lecturer, "To him who loves to contemplate the wisdom

and skill of the great architect of the Universe, Anatomy and Physiology present probably the richest field. Astronomy may, indeed, bear more magnificent testimony to the power of that hand which broke the rule of chaos, whereas

> "Lo! fierce and fresh a radiant host of stars
> Wheel'd round the Heavens upon their burning cars!"

Or to the potency of that voice,

> "Which spake, and lo! a universe was born,
> And light flashed from God for her birth day morn."

Geology may tell in loftier strains of the wonderful operations of Deity, as recorded in the historic page of the valley and the mountain, but the body of man, in its structure and functions, speaks in a much more intelligible voice of the wisdom of that mind which planned, and the power and skill of that hand, which formed it."

We would gladly transfer other extracts to our pages, and particularly the able reply to the objection that these studies tend to scepticism, but we are admonished to stop by the laws of the Journal, having already exceeded the limits assigned us.

GEOLOGY. NO. I.

Geology is the natural history of the Earth. Its object is to ascertain the nature and distribution of the materials, which constitute its solid structure; the changes which the outer crust has hitherto undergone, the evidences of which are every where to be seen; and the probable causes of those changes.

This science is comparatively of recent origin. It is only within the last quarter of a century that it has commenced to excite general attention, even amongst the learned. But though yet young, its growth has been so rapid, that it has already nearly reached maturity. To this result, the activity and patronage of the Geological Societies of England and the continent of Europe, and the liberal appropriations of money, made by some of our own state Governments, for the purpose of a thorough exploration of the agricultural and mineral resources of their several territories, have, within the last six or eight years, mainly contributed.

It is not only highly interesting as a science, but it promises, by its investigations, the most useful practical results. On this account, we feel the less hesitation in directing the attention of our readers, in a few short articles, to its general facts and conclusions, hoping by this means to excite, in such of them as have not yet bestowed much time upon the

subject, a determination to give it a minute examination. It is our design to give these articles an elementary character, pursuing, as much as possible, the order of things, as they would present themselves to an independent explorer, rather than follow the leadings of any particular writer or theorist.

To the *votary* of *science*, Geology presents numerous points of great and absorbing interest. If the laboratory of the chemist is attractive on account of its surprising developements, the new and unexpected compounds which are there formed, and the singular relations which different kinds of matter are found to hold towards each other, no less interesting must be the study of the chemical and physical changes, which have, for ages past, been taking place on so stupendous a scale in the great world of nature, the evidences of which we perceive, in the altered and disrupted rocky strata of the Earth, and in the widely diffused remains of its own former inhabitants left imprinted on its solid skeleton. By means of its ever-active internal fires, and external waters and atmospheric agencies, it has, more than once, been made to change the condition of its outer crust, and, by means of its hidden electric energies, it has filled many of the fissures in that crust with the richest metalic ores.

To the *political economist* and *citizen* this science is of no less interest and importance. Since two-thirds of the two hundred millions of square miles, which the Earth's surface contains, are covered with water, and, of the remaining one-third, a considerable portion is occupied by burning sands, or rocky mountains, or is bound by an inhospitable climate, and is therefore incapable of producing the means of subsistance to man, it is an interesting question: "How may the remainder be made to sustain the largest possible population with the greatest comfort and advantage?" In this view of the subject, the nature of soils, their productiveness, their improvement, and the extraction of its mineral treasures from the bosom of the Earth, all acquire the highest degress of importance.

1. The first circumstance, which would probably arrest the attention of an independent observer, is that the materials, which compose the Earth's surface as far as we can penetrate it, exist either in a compacted and solid form constituting *rock*, or in a finely divided and comparatively loose state constituting *soil*. The latter, almost every where, covers the former to various depths, sometimes extending downwards very far, at others only a few inches, and at others being entirely wanting, so that there the rock extends to the surface. In many cases the soils are plainly seen to have been derived from rock of the same kind as that which they overlie, having resulted from their disintegration. Thus we have,

covering a large portion of Adams county, a red soil derived from the underlying New Red Sandstone. In many other cases, however, the soils differ in their character from the rocks which they overlie, having been brought from some distance by the transporting power of water. Thus a limestone soil often covers a substratum of slate, having been brought from a neighboring limestone region. From this, it would appear that rocks and soils are composed of the same materials, the one having been derived from the other. What are, then, these materials?

Chemistry teaches us that there are sixty-one elementary substances or different kinds of simple matter, of which forty-eight are metals. Of these, combined in various proportions, all material bodies are composed. But few of the metals are found pure in nature, being mostly in combination with oxygen, forming with it a pulverulent substance called in scientific language an *oxide*, but in common language an *earth*. These constitute the rocks, soils, and the whole crust of the globe as far as our knowledge of it extends, which is to the depth of from one-half of a mile, by means of mines, and through the materials ejected from the craters of volcanos, to a much greater depth.

It, however, by no means follows that each of these sixty-one elements enters into the composition of every rock and soil, or that they are alike abundant. The most abundant are Silica, silex or the principal ingredient in pure sand, Alumina the principal ingredient in potters clay, Lime, Magnesia, oxide of Iron, Potash and Soda. These constitute more than nineteen-twentieths of the crust of the globe, whilst a few of the others, with the remains of animal and vegetable substances, of which carbon is the most abundant, form the remaining one-twentieth.

When two or more of these element are combined so as to produce a substance homogenous in its appearance and other physical properties it is called a simple *Mineral*, although it be chemically compound. The most common minerals are Quartz, Felspar, Mica, Hornblende, Talc, Chlorite, Limestone, Gypsum, and the oxides of Iron. Quartz or Silica is the pure ingredient in flint or sand, and is very extensively distributed over the globe. There is scarcely a rock or soil from which it is entirely absent, and no soil is fitted for vegetation without it, since it is an essential constituent of many plants, especially of the grasses, reeds and cerealia.—Felspar, (which is composed of 65 Silica, 18 Alumina, 14 Potash, and a trace of Lime and Iron,) and Mica, (which consists of 36 Silica, 31 Alumina, 8 Potash, 8 Iron, and 1 Magnesia,) are also abundantly distributed, constituting with Quartz the rock called *Granite*. Frequently the Mica is replaced by Hornblende, (which does not differ very much from it in chemical composition, except that it contains more lime and magne-

sia,) and then are formed the Hornblende and Syenite rocks, in which Quartz is either wanting or exists usually in but small quantities. The Syenite rock and Greenstone are abundant in Adams county, differing from each other in nothing so much as in texture, in the former the constituent minerals being large and distinct, which is not the case in the latter. Talc and Chlorite exist abundantly as materials in the composition of rocks. We have both talcose and chlorite slates in the axis and along the south-eastern flanks of the mountain, which skirts this county on the North-west. Limestone itself also forms extensive beds of rocks, and is to be found in almost every part of our country. This is decidedly the most valuable rock to man, both on account of its advantage to the soil in increasing its productiveness, and its uses for economical purposes. The slates are chiefly composed of sand and clay, resulting from the pulverized materials of lower rocks, and although extensively distributed, seem, in general, to be chiefly useful in affording the materials for fresh soils.

2. A second circumstance, calculated to arrest our attention in an examination of the structure of the globe, is that the higher rocks or those which are nearest the surface are generally found to be disposed in layers of from one inch to several feet in thickness. These are said to be *stratified.* The lowest, of which we have any knowledge, are *non-stratified;* that is, they are not divided by parallel planes, or they manifest no tendency to split in one direction rather than in any other. The stratified always preserve the same relative position in reference to each other, so that they are never found to interchange places, except in a few instances, where a local inversion, caused by some violent action from below, has taken place. They also preserve the same mineral character or the same fossils, by which they are at once identified all over the world. It must however not be supposed that the strata are co-extensive with the Earth, covering it every where alike, as an onion is covered by its several coats. They vary very much in thickness and extent in different places, some being entirely wanting in some localities; but still the invariable relative position of the rest to each other is preserved. Their number, when all are taken together, is considerable, and their collective thickness is not less than several miles; these facts being ascertained by following the course of some stream, which makes a natural section at right angles to the direction of their *strike.* Being considerably inclined to each other, and making their appearance successively at the surface, they can be counted and measured, and the aggregate can thus be obtained. In this way, following the course of the Susquehanna from its mouth in the Chesapeake Bay along its numerous

passes through the Apalachian mountain ridges up to its sources, we ascertain that the aggregate thickness of the stratified rocks of Pennsylvania is equal to 43900 feet or 8 miles, and thus our knowledge of the structure of the earth may be affirmed to extend downwards to the depth of not less than eight miles.

COLLEGE RECORD.

The Philomathæan and Phrenakosmian Societies of Pennsylvania College celebrated their Anniversaries, in Christ's Church, the former on Wednesday evening, the 18th ult., and the latter on Wednesday evening the 25th ult. That the unusually large audience, which crowded the church on both occasions, was highly interested and delighted it is needless to state. To institute a comparison between the performances of the young gentlemen, would be invidious; but we hesitate not to say that they all, no doubt, gave ample satisfaction to the societies which they severally represented, and to others who had the pleasure of hearing them. The orations of the performers were, in general, well prepared and well delivered, and reflected honor on their authors. We were particularly pleased with the moderation, and freedom from extravagant praise of their subjects so common on such occasions, which was displayed by several of the speakers.

Order of Exercises of the Philomathæan Society:

PRAYER by Rev. J. P. B. SADTLER. ORATIONS—"Byron"—*M. W. Merryman*, Baltimore county, Md. "Dignity of Human Nature"—*A. C. Wedekind*, York, Pa. "Modern Humbugs"—*H. C. Eckert*, Littlestown, Pa. "Mysticism"—*J. A. Houck*, Gettysburg, Pa. Benediction—By Rev. Dr. KRAUTH.

Order of Exercises of the Phrenakosmian Society:

PRAYER by Rev. Prof. W. H. HARRISON. ORATIONS—"Little Things" *G. Albert*, Adams county, Pa. "The utility of the Classics"—*Wm. H. Stevenson*, Gettysburg, Pa. "Character and Death of Gen. Hamilton" —*Wm. H. Witherow*, Gettysburg, Pa. "The last night of Sodom"—*R. A. Fink*, Middletown, Md. Benediction—By Rev. Dr. KRAUTH.

It is no more than justice to state that the interest on those occasions was greatly increased by the very appropriate and excellent vocal and instrumental music furnished by the "Hayden Association," of Gettysburg. Their efforts to please and entertain proved eminently successful, and were regarded as exceeding in quality and execution all of a similar character presented on former occasions.

Pennsylvania College, Gettysburg, Pa.

PENNSYLVANIA COLLEGE has now been chartered about fourteen years. During this time its progress has been such as to gratify the most sanguine expectations of its friends. The course of studies is as extensive and substantial as that of any Institution in the Country. The *Preparatory Department* provides for instruction in all the branches of a thorough English, business education, in addition to the elements of the Mathematics and Classical Literature. The *College Course* is arranged in the four classes usual in the Institutions of this country.

The government of the students is as energetic as their circumstances seem to require. They attend at least two recitations a day, Church and Bible Class on the Sabbath, and are visited in their rooms so frequently as to preclude the danger of any great irregularities. It is believed no Institution in the United States has more exemplary young men in connexion with it. They are all required to lodge in the College Edifice, special cases excepted.

The annual expenses are—for board, tuition and room-rent, during the winter session, $61 87½: for the summer session, $41 87½. Washing, $10 00; and Wood, $3 00. Total expense, $116 75. Boarding can be obtained in town at $1 25 per week.

There are two vacations in the year, commencing on the third Thursdays of April and September, each of five weeks continuance.

Acknowledgements of Donations to the Cabinet of the Linnæan Association of Pennsylvania College.

March, 1846. From *Mr. J. Aughinbaugh*, Canis Cinereo-argentatus (Gray-fox)
2. *Rev. W. S. Emery*, Iron ore.
3. *Miss Raush*, York, Pa., Indian cloth and soap.

Receipts during February.

Jacob Smith, Leitersburg, Md.	paid in full.
Rev. A. H. Lochman, York, Pa.	"
Rev. S. Oswald, "	"
Rev. J. G. Capito, "	"
Fred'k. Waesche, Baltimore,	"
Wm. Walter, Huntingdon co.	"
H. F. Bardwell, Manchester, Md.	"
Rev. Geo. Diehl, Easton, Pa.	" inclu. Vol. 1st.
John Ridenaur, Lebanon, "	"
Elias N. Reynolds, Indiana.	" Vol. 1st.
Rev. E. Bridenbaugh, Newville, Pa.	"
John Stevenson, jr. Gettysburg,	" Vol. 1st.
A. Essick, "	"
J. Bradshaw, "	"
Prof. W. H. Harrison, "	"
G. A. Nixdorff, "	"
J. N. Unruh, "	"
A. C Wedekind, "	"
D. Middlecoff, "	"

VOLUME II.] [NUMBER 6.

THE

LITERARY RECORD AND JOURNAL

Of the Linnaean Association of Pennsylvania College.

APRIL, 1846.

CONDUCTED

By a Committee of the Association.

CONTENTS.

1½ sheet, periodical—Postage, 2½ cents, to any distance within the Union.

NEINSTEDT, PRINTER, GETTYSBURG.

THE LITERARY

RECORD AND JOURNAL

OF THE LINNÆAN ASSOCIATION OF PENNSYLVANIA COLLEGE.

Vol. II. APRIL, 1846. No. 6.

PALÆONTOLOGY, OR FOSSIL REMAINS, NO. II.

Towards the end of the eighteenth century, Geology, properly so called, made very great progress, and that which especially contribnted to it was the study of the distinctive characters of different rocks, and the attempts made to classify them. Werner and de Saussure are the two most prominent names of that epoch; the first celebrated for his researches on the stratified rocks and their super-position, and the latter for his investigations of the primitive rocks. However intimately connected with Palæontology these geological discoveries may be, it would lead us from our subject to dilate on them here; we have nothing to do at present with the disputes of the Vulcanists and Neptunists, those two rival schools, both of which, in their fierce contentions, over-leaped the truth in fighting for victory.

Much less can we here retrace the numerous and brilliant geological discoveries which signalized the beginning of the nineteenth century, nor show the changes in the science and its onward march, wrought by the labors of Elie de Beaumont, Leopold de Buch, Lyell, Murchison, &c. &c. We can only dwell on the progress of Palæontology during the same epoch.

This study, then in its infancy, received at the beginning of this century an impulse, and advanced in developement in a manner that is rare in the history of science. It is to the genius of Cuvier that these changes are due, and his researches on fossil bones will ever stand as one of the most splendid monuments of the human mind. Nearly all the ideas, the theories, and observations which have been developed, during the last thirty years owe their origin to Cuvier's genius. It is the spirit of his labors, which led to those numerous and remarkable discoveries, which have astonished even men not devoted to scientific researches.

It will not be superfluous to enter here into some details on the discoveries of Cuvier.

The principal question, which this illustrious *Savant* sought to resolve, was to know whether fossil species are different from those at present existing. This question had been more or less agitated, but no precise answer had been given. Some observations led Buffon to think that there were some extinct species, but the state of comparative anatomy, at that period, was such, that he was not able to prove it. Pallas, on his part, called the attention of the learned to the elephants and rhinosceroses covered with hair and found imbedded in the ice of Siberia; but it was not determined whether the differences of tegument indicated difference of species or the influence of climate on the same species.

Cuvier is the first one who treated this question in a manner which led to its solution. Before him, excepting in a few cases, they tried to solve it by the study of fossil shells, which are much more abundant than the remains of large animals. Cuvier perceived that, however manifest were the proofs of the extinction of some fossil species, these proofs must necessarily be made to apply to animals of a large size, however incontestable was their non-existence at the present time. As regards the smaller animals, the mollusks for example, the state of the collections, and of zoological knowledge did not permit any one to affirm, with full confidence, that the species found as fossils, and of which the living analogues were unknown, were not really in existence. It was said that possibly their habitation in deep seas or unexplored regions had even to this day escaped the search of collectors. From that time the conclusions, drawn from a comparison of fossil and living species, destitute of a solid basis, wanted rigor and always remained uncertain.

Cuvier showed, on the other hand, that the large animals were nearly all known for many years, that modern science has added very few species of a large size to those known by the ancients, and that the continents and seas are now traversed and explored so thoroughly, that they do not conceal from us any large quadrupeds of unknown forms. It is then evident, that the comparison of living and fossil mammals would give us results more striking and certain than that of inferior animals, and that, if this comparison demonstrates that the fossil species are different from those which now exist, the conclusion should be received with confidence. The illustrious naturalist at once set to work, and established the science of comparative anatomy, and with a perseverance and learning that are amazing, he worked out these palæontological problems, which now stand as enduring monuments of his genius and industry. He proved that nearly all the fossil species are different from the living ones. He established the fact that no living species are found

in a fossil state, and that all the species, of the epochs anterior to the present, are different from those which now inhabit the globe. He went even farther, and showed that the species of the different formations differ among themselves as distinctly as they are distinguished from those of the modern epoch. From this we see how intimately palæontology is connected with geology, and the aid it affords the latter science in determining different formations. J. G. M.

GEOLOGY. NO. II.

3. A third circumstance, which, in the progress of Geological investigations cannot fail to arrest our attention, is not only that the loose materials, which form soils, have been transported from one place and deposited in another, sometimes to a vast depth and extent, but that the rocks, which form the solid frame-work of the Earth, have been broken up and variously contorted, sometimes being tilted up so as to stand on their edges, at others lying highly inclined to the horizon, and at others bent in arches and irregular curves.

These facts, which any one can easily verify by personal examination, we have endeavored to present in the following figure, which is designed to represent an ideal section of the rocks of the United States, beginning on the Atlantic slope and terminating west of the Allegheny mountains.

On the east, at A, are *Gneiss* rocks, the same as Granite in composition and associated with it, only that they are stratified, standing almost perpendicularly or highly inclined to the horizon; farther west towards B, are Sienite and Greenstone, of which a dyke at G is represented as protruding through all the super-incumbent rocks up to the surface. Above these, at E, are found strata of red shale and sandstone (New Red Sandstone of geologists,) inclined about 20° to the horizon and dipping westward. This *formation* or series of rocks occupies a large extent of surface, lying mostly east of, and stretching parallel to the Blue Ridge, the most eastern ridge of the Appalachian chain. From B westward towards D, we find the limestone, sandstone, and shale or slate strata, which form the mountain ranges and surface rocks, and which lie open

to examination, variously curved and folded together, so as in many instances, as at B, to be almost folded back upon themselves. It will be seen that the curvature or foldings of the strata are greatest on the east, and constantly diminish as we proceed westward. At C, the uppermost stratum, which is that containing coal is nearly perpendicular to the horizon, whilst at F and D, where it re-appears again, after having been wanting between C and D, it is nearly horizontal. Hence we find, that whilst the coal beds in Eastern Pennsylvania are highly inclined to the horizon, those of Western Pennsylvania and farther west are nearly horizontal, and are worked by carrying tunnels or horizontal galleries into the sides of the hills, along which the coal crops out or appears at the surface.

Now this shattering, turning up on their edges, and curving and folding of the successive strata of rocks, if they were not placed in their present position at first by the hands of the Creator, give evidence that they must have been subject to some violent disturbing force from below, and that this force must have operated most violently on the east and diminished in intensity in the west. Nor is this disruption and bending of strata peculiar to the Eastern United States, but it is found every where, in all countries over the globe, and is one of its most general features; so that if a disturbing cause existed, it has had a very wide range of operation. After the question, whether these strata give any internal evidence that they have not always existed in their present form and position, shall have been disposed of, it may be proper to inquire into the causes which have been instrumental in producing changes.

4. Another circumstance, which cannot fail exciting our interest, is that the stratified rocks afford the strongest evidence that they were, all perhaps without exception, formed or deposited in succession by water. On this account they are often called *sedimentary rocks.*

First, their occurrence in strata affords a strong presumption in favor of this view. They could be deposited in successive strata only from a fluid state; the materials having either been fused by fire, or held in suspension by water. Their structure, and the organic remains or fossils, which many of them contain, afford proof sufficient that they had not been rendered fluid by fire, but by water.

Secondly, the higher rocks often contain or are made up of the fragments of those which lie below them. Some are made up of the angular fragments of previously existing rocks. Such is the character of the Limestone Breccia, which seems to occupy the angle formed, at the Eastern base of the South Mountain or Blue Ridge, by its highly inclined strata with the slightly inclined strata of the adjacent red shale and

sandstone. The Breccia is made up of fragments of limestone, evidently derived from the valley beyond or west of the mountain, and cemented together by a red cement like that of the contiguous red shale. Some are made up of pebbles, or contain them in large abundance. These pebbles are the *water-worn* fragments of lower rocks, and afford conclusive evidence of the difference of age of the different strata. The lower must have been first broken up, their fragments subjected, for some considerable time, to the action of running water, and then these rounded fragments deposited in connection with fine mud or other cement in layers over the broken edges of the lower strata. Every imbedded pebble and grain of sand, which forms a part of a stratum of rocks is, therefore, proof sufficient of the agency of water in the production of stratified rocks.

Thirdly, the presence of organic remains in stratified rocks proves most incontestably their aqueous origin. If their presence were only occasional or confined to a few localities they might be regarded as accidental or as not being an essential feature of the rocks in which they occur, but as they are to be found every where, and in many instances in the greatest abundance, they are characteristic, and, undoubtedly were present when the rocks were formed.

These remains are both vegetable and animal, and consist frequently of the less perishable parts of the plant or animal, the carbon of the former being preserved in the great coal measures, in which the stems and trunks, and even the delicate vegetable structure are yet visible, so that the genus and species of the plant or tree can be identified; and the bones, and shells, and even excrements of the latter are found nearly unaltered, so that the animal to which they belonged can be identified, and even the nature of its food determined. In other instances, and particularly in the lower rocks, merely the impressions or casts remain, the original organic matter having been decomposed and displaced by mineral matter. This latter class are called *petrefactions* in which the plant or animal *appears* to have been converted into stone. Casts of this kind are to be found in all kinds of rock, limestone, sandstone and flint. It is wonderful with how much accuracy and delicacy these prints are often taken in the solid rock, so much so, that the most delicate leaf of a plant has its fine nerves and lines faithfully represented. Even insects and the spider-web have been found mineralized. Besides these, we also find foot-prints of birds and animals, which must have been made on the surface of the rock, whilst yet it was soft sand or mud. These foot-prints are found on the surface of rocks lying at some considerable distance down in the series of strata, and show most clearly that the rocks

were formed by aqueous agency, and successively at different intervals of time. As a further evidence of the same kind, we may state the interesting fact, that even the impressions made by rain drops upon what was once sand or mud, are preserved in rocks so distinctly, that we cannot mistake their character.

Now all these facts are consistent only with the supposition, that the stratified rocks were formed from the washings of those existing before, and that animals and plants or parts of them were quietly imbedded with them, and converted into the solid form in which we now find them; for heat would evidently have destroyed what we now find so remarkably preserved. And with these facts before him, we think, no one, in his senses, will maintain that the stratified rocks were originally formed by the Creator in their present form and position. They are the imperishable monuments of the Earth's past history, which, unlike the records of nations, have never been interpolated or falsified, and thus rendered unworthy of trust, and which enable us to go back to the period, when time was yet young, and thence, assured that no important fact has been lost or left unrecorded, trace, in indelible characters, the great series of events as they transpired, and the successive revolutions, which took place in the exterior crust of the globe, and in the races of its inhabitants, until we arrive at its present state, so well adapted to support and give exercise to the highest forms of organized being. Whilst of *mere theories* we may be afraid, of *facts* we dare not. Of these, Geology spreads out before us the richest treasures, inviting us to come and make them our own; nor should we be deterred from the delightful labor, though men, who have never spent an hour in the field of personal observation, or learnt more than some of the terms of our science, should call us "*sciolists*," because we, equally loving the Book of Revelation, should differ from them as to the proper reading and interpretation of the Book of Nature, which the great Ruler of the world has opened to our view.

THE MOON.

None of the larger bodies, which compose the solar system, can compare with this little satellite in the interest which it has excited.—With none do we possess so intimate a physical acquaintance, and none has been invested by popular superstition with so great and so varied influences.

In magnitude it is comparatively insignificant, being only 2160 miles in diameter, and it is exceeded in bulk many thousand times by other

planets in our system; but, notwithstanding this, its proximity to the Earth, its influence upon aerial and aqueous tides, its supposed effects upon atmospheric phenomena, its striking splendor when seen at its full in a cloudless sky, all have served to give it a degree of importance to which its bulk alone would never have entitled it.

The investigations of astronomy have thrown a flood of light upon the physical condition of this little globe, which may well excite astonishment. It has been rendered probable, for example, that water does not exist upon it, that it has no atmosphere, or one which is exceedingly rare, that its surface is extremely diversified and irregular, that its mountains, although absolutely less, are relatively greater than any upon the surface of our globe, and that a volcanic formation is prevalent over the whole. The appearances and magnitudes of its craters have been ascertained, their depths and the heights of its mountains have been measured, and maps of the lunar surface have been constructed more accurate in their general features than those of any equal portion of the Earth's surface. All these results admit of easy explanation when we consider the great improvements that have been made in the construction of instruments and the vast increase of power which has thus been gained. Astronomers can now not only look *at* the moon, but they can look *into* it.

The non-existence of water or of a dense atmosphere is proved by the fact that no clouds are ever visible upon it. Were there oceans, seas, lakes, rivers or even portions of water mechanically or chemically united with material substances, this fluid would be subject to the general law of evaporation, and, upon the supposition that the moon has a gaseous atmosphere like that of the Earth, would form clouds by its unequal condensation, or, in the absence of such an atmosphere, be instantly condensed upon the side opposite the sun in consequence of the great cold there prevailing.

But that no atmosphere exists, is fully proved by the fact that the stars which approach the disk of the Moon suffer no refraction. Direct telescopic observation has also failed to discover the existence of any level which could be supposed to correspond to a fluid surface. The consequences of this fact are highly interesting; without water animals and plants cannot exist, and consequently the surface of the Moon must be destitute of vegetation, and of all other forms of organized matter: it can have no inhabitants, at least none who are in any respect constituted similarly to ourselves, and its surface, when compared with that of our own beautiful planet, would afford a contrast more striking than is exhibited between the luxuriance and variety of the tropics and the sterile uniformity of the polar regions.

The existence of mountains upon the Moon is proved by the irregularity of its outline. This is particularly observable in some of the phases; and as these irregularities can be greatly magnified, and their extent with the lengths of their shadows accurately measured, it is easy perceived that a very correct estimate can thus be made of their elevations and depressions, or in other words that we possess the means of measuring the heights of the mountains and the depths of the valleys. Elaborate telescopic investigation has shown that there are no parts of the lunar surface that are perfectly level but the most singular structure is found to prevail. Crater shaped cavities varying from 50 to 60 miles to a few hundred feet in diameter, and mountains, whose brilliantly illuminated summits are strongly contrasted with the dark masses of shadow which they cast, are irregularly scattered over every part.

That the Moon exercises an important influence upon our planet cannot be denied, but it is equally true that this influence has been greatly over-rated, and that popular superstition has invested this little globe with powers and properties to which it has no claim and which in many cases are equally absurd and ridiculous. That the phenomena of tides is caused by its attraction is an established fact, but apart from its attraction we can perceive no other physical influence, and all its reputed effects, which cannot be accounted for on this principle, should in general be rejected as having no foundation in reason or in fact. Amongst these influences that which the Moon is supposed to exert upon the weather is perhaps the most generally believed. We are not prepared to deny that some effects may be due to this cause, but we believe that it is greatly overrated, and that amongst the innumerable causes of atmospheric disturbances, that which is due to the Moon may be altogether over-rated. Considered as a question of science it is certainly difficult to explain how or why the periodical phases, which depend only upon certain relative positions of the Sun, Moon, and Earth, can greatly affect our atmospheric phenomena; there appears not to be sufficient connection between the effects and their reputed cause.

None of the known laws of nature has as yet been able to explain why the Moon should influence the movement of the sap in plants, the durability of a roof shingled in a particular phase, the time of felling timber and a thousand other things which are commonly received as facts. It does not follow, that because a thing is generally believed, it must necessarily be true.

THE ASTEROIDS.

BY D. KIRKWOOD, OF LANCASTER, PA.

The first day of the present century is memorable in the annals of astronomy for the discovery of the planet Ceres; the first discovered of those telescopic bodies to which the term *Asteroids* has been applied. The smallness of its size, compared with that of the other planetary bodies, induced Dr. Olbers to conjecture that it might possibly be the fragment of a larger planet, which, at some remote period, had been violently disruptured. The subsequent discovery of Vesta, Juno, and Pallas, at nearly equal distances from the sun, was regarded as affording strong presumptive evidence of the truth of his conjecture. It is stated, moreover, in the last number of the "Record and Journal," that "the orbit of Astræa, (the newly discovered Asteroid,) agrees with the supposition of a common point of re-union among the different fragments of the larger planet from which these smaller ones have been supposed to have been severed." This hypothesis has, in general, been favorably received by astronomers. In the list of its advocates may be found the names of Brewster, Dick, Lardner, and many others of scarcely less distinction in the scientific world. I propose to notice briefly some of the considerations alledged for its support.

1. It is said that the order discoverable in the distances of the planets from the sun, demands the existence of *one* planet between the orbits of Mars and Jupiter, at about the mean distances of the Asteroids.

This relation was first observed, towards the close of the last century, by M. Bode, of Berlin, who remarked that one of the terms of the progression was wanting. He conjectured, therefore, that in this interval there might possibly exist an undiscovered planet. According to this astronomer, if 10 be assumed as the earth's distance from the sun, the distances of the other planets may be expressed as follows:

Mercury,	2^2	$=4$
Venus,	$2^2+(3\times2^0)$	$=7$
Earth,	$2^2+(3\times2^1)$	$=10$
Mars,	$2^2+(3\times2^2)$	$=16$
———	$2^2+(3\times2^3)$	$=28$
Jupiter,	$2^2+(3\times2^4)$	$=52$
Saturn,	$2^2+(3\times2^5)$	$=100$
Herschel,	$2^2+(3\times2^6)$	$=196$

This series, it must be acknowledged, furnishes us with a remarkable approximation to the relative distances of the planets. It is, however, purely empirical. In other words, it cannot be shown to obtain

as a necessary consequence of the operation of the known laws of nature. It will be seen, moreover, by the following table, that, unlike the great laws of Kepler, *it is by no means strictly and universally correct.*

	True Distance from the Sun. *Miles.*	Distance according to Bode's law. *Miles.*
Mercury,	36,765,000	28,000,000
Venus,	68,717,000	66,500,000
Earth,	95,000,000	95,000,000
Mars,	144,750,000	152,000,000
Asteroids,*	251,000,000	266,000,000
Jupiter,	494,263,000	494,000,000
Saturn,	906,190,000	950,000,000
Herschel,	1,822,327,000	1,862,000,000

It appears, therefore, when we attempt a numerical verification, that the distance of Mercury according to Bode's law, *exceeds* its true distance by more than one million two hundred thousand miles; whereas, that of Venus, the next planet in the system *falls short* of the true distance two millions of miles. In some of the other planets. and especially in Saturn, a much greater discrepancy is found.

2. The small size of the new planets has been regarded as strongly favoring the hypothesis under consideration. To this it may be replied that, according to the estimate of Schroeter, there is much less disproportion between the magnitudes of Juno, Ceres, and Pallas, and their interior planets, Mercury, Venus, the Earth and Mars, than between these and the larger planets, Jupiter, Saturn, and Herschel.†

3. It has been asserted that these planets are not spherical, like the other bodies of the system, but of an irregular shape, as might naturally be expected in the case of their being fragments of a larger planet. This irregularity, however, is not discovered by actual observations on the bodies themselves, but only inferred from the sudden diminution of their light, when, as is supposed, their angular faces are towards us. This phenomenon will doubtless admit of a different and more probable explanation. But for a pre-conceived notion in regard to the origin of these bodies, their globular form would perhaps never have been called in question.

If the Asteroids are "the ruins of a shattered world," the catastrophe which produced their avulsion must confessedly have occurred anterior to all history; since no astronomical records furnish any evidence

* Average mean distance.

† Dr. Dick considers the estimates which have been made of the magnitude of Vesta entirely too small, and infers from the fact of its having been seen by the naked eye, that its diameter cannot be less than 1200 miles.

that such a planet was ever observed. Now if five small planets have served for thousands of years to supply the chasm in the planetary distances, there seems to be no necessity whatever for supposing that they have not done so since the system was first arranged by the Creator.

The new planets are found to have atmospheres of great height and density. But is it not absurd to suppose that in the event of the explosion of a planet with a force sufficient to hurl its parts *forty millions of miles asunder*, these fragments should be respectively attended by a portion of the atmosphere of the original body?

It is remarked that the space through which the new planets revolve, separates the solar system into two distinct sets of bodies, in each of which is found a striking resemblance. Mercury, Venus, the Earth, and Mars, are nearly of the same density;* they are not very different in magnitude; and their diurnal rotations are performed in nearly equal times. The major planets, on the other hand, have an average density of less than $\frac{1}{4}$ that of the minor planets being 1. they have all a number of satellites; finally Jupiter and Saturn, (and it is thought Herschel also,) revolve on their axis in nearly equal times; the angular velocity of their diurnal motion being more than twice that of the minor planets.

EXPLORING NATURALISTS. NO. II.

It has become of late years a common resource, with the learned societies in Europe, to employ and pay scientific collectors, through whose skill, science, and industry, they furnish their great museums of Natural History. Out of the residuary parcels of duplicates, many private cabinets become enriched.

In the spring of 1832, there embarked at Baltimore for Charleston, a Prussian botanist, Carl Beyrich, whose errand was of the description above named. He was of middle stature, usually walked somewhat bent forward, with a dreamy inquisitive attitude, thin in feature, eyes easily lighted up, and made to glow with pleasure, a hooked nose, betraying his great courage and perseverance; but he was evidently in bad health, asthma having for a long time seriously impaired the happiness of his existence. We saw him for the first time as he descended the cabin of a Charleston sailing packet, in company with a scientific friend, also a botanist of some repute, at that time in Baltimore, Mr. Dickehut, who was considerately and hospitably intent upon furnishing him with every

* Professor Encke, of Berlin, thinks the density of Mercury less than one-half of that estimated by Lagrange. See his letter to Mr. Airy, dated Dec. 1841.

aid and comfort for the brief voyage he was about to make. Mr. Beyrich however cared little for those trifles, he had but a short time since landed with some emigrants from a European voyage, and having encountered its perils and discomforts, those, which the anticipated one might bring forth, were held at a discount. He was careful however of his thermometer, traveling compass, some necessary books, and sundry reams of dark, coarse, but very bibulous paper. Quite a discussion arose between them as to the selection which had been made of this article, but the Prussian knew what the American apparently did not, that this coarse paper, probably half made of woollen rags, did not contain any bleaching salts, with which most paper is prepared, for the purpose of whitening it, the presence of which would have certainly caused the colors of his dried plants to fade rapidly.

He was a very agreeable person on board indeed, had learned the English language entirely on his voyage out to America, and could speak it intelligibly, and in any difficulty always eked out his phrases with that great conventional tongue, the French. When the weather permitted, he was constantly on deck, examining the temperature of the Gulf Stream as we neared, entered, or passed out of it. At his request the bucket was frequently thrown over the side to bring up the floating sea weed or any other object which swam within reach. Entangled in the gulf weed *(fucus natans)* not unfrequently were found small crustaceans, curious fishes, or microscopic forms of animal life, which his ever ready magnifier brought into view. These caused him great delight, and his attention had evidently been directed to other branches of Natural History besides Botany.

Trifles of a certain description, especially if accidental or otherwise irremediable, did not distrub his equanimity; as when a flaw of wind blew his *Burschen's* cap off at sea, it was testified by a shrug of the shoulders, and a little sigh, as it floated astern beyond recovery; on one stormy morning, when the steward placed on the table a liquid, which he was pleased to designate as coffee, but which looked and tasted more like an infusion of his greasy black cap, than of the Arabian berry. The queer look of astonishment he wore, when he asked, "What is it?" will never be forgotten. To intrude upon his hour of study would irritate him; he had no time to waste, nor any wish to gratify that American custom of killing another's time, when you have nothing to do with your own.

We crossed the bar and entered the bay of Charleston on a still afternoon in May. Here Mr. Beyrich feasted his eyes on the first glimpse of southern vegetation, all new to him and full of promise, as it was

shadowed forth by the tufted heads of the Palmetto, which lined the shores of the bay. He was prepared to recognize every plant he should meet with, and to pronounce at once infallibly whether it were described or not. He had diligently studied all the works upon the subject, and especially the most excellent guide to the Flora of the Southern States by Elliot. This last, he had made entirely his own, and had abridged and copied out into a manuscript book for convenient references all the species described in it.

He had no sooner landed and secured a lodging, than he plunged into the neighboring suburbs, swampy and repulsive as they are. His delight at seeing the Sarracenias, Utricularias, Wistarias, Iteas, and other genera was rich indeed, gathering them where they grew, surrounded by others equally new though less conspicuous. He made large collections of dried plants at this place, and was hospitably received, by the citizens, who are as renowned for their fine gardens, and their feeling for scientific pursuits, as for their hospitality. He proceeded from here to the upper country, and remained among the mountainous districts of the States of South Carolina and Georgia, until a late period in the autumn. Then he returned to Baltimore bringing with him his rich acquisitions. He spent the winter in opening his parcels, arranging, labelling and repacking them, previous to their transmission to Europe. His great industry in the field, rendered this a herculean labor, and he would have been unable to accomplish it in time, had he not been aided several hours every evening by Mr. Samuel Feast, a Florist near this city, with whom he resided, whose knowledge of plants is extensive and accurate. Mr. Beyrich lived here, surrounded by plants living and dead, and the numerous and well filled green-houses were his daily resort and recreation, when wearied by study and laborious application, to which he was addicted. The results of these researches among the hidden botanical treasures of the south yielded nearly two hundred new species, and the whole collection was forwarded to Berlin. If these new species have ever appeared in their scientific journals, it has not come to the knowledge of Mr. Beyrich's friends in America. He also caused to be gathered great quantities of seeds of our plants, and especially of the forest trees, which were sent off in casks, so large was the amount, and to ensure against loss from being imperfectly packed.

Early in May of the year succeeding that of his arrival in America, he started upon an expedition to collect plants from the district of country lying between the Mississippi river and the Rocky Mountains. For this journey he had made all necessary preparation, by study of the geography of the country, the tribes which inhabit it, its resources to fur-

nish food and subsistence, and especially such points in its Natural History as could be then made out. But little more was then known of the latter, than was to be derived from the scanty materials furnished by Long's Expedition; for Messrs. Nuttall and others visited it a few years after, bringing home the fullest account of its plants.

Before leaving the Eastern States, his friends felt exceedingly anxious concerning the effect of this long journey upon him, and of the exposure he might suffer from encamping out, when far from any human habitation at night. The issue, in its disastrous consequences, justified their fears in the fullest extent. He had proceeded up the Arkansas into the country of the Osages, when, being exposed in an inclement spell of weather, the consuming fires of disease within were suddenly lighted up; that form of consumption, which had remained so long quiescent, was suddenly excited into great activity and violence, insomuch that he had barely strength left to reach Fort Gibson. Here, after receiving the attention which the officers on our distant posts are so ready to afford a stranger in distress, he lingered a short time, to die far away from his friends and his fatherland. His last resting place is near the rushing waters of the Arkansas.

His collections and other effects being brought to Baltimore, were for the most part transmitted to Europe. His traveling furniture, collecting boxes, &c., were sold by order of the orphan's court, and the writer of this article has rescued a *vasculum*, which was to have been appropriated to a baser purpose, (he had two or three in constant use), and still retains it as a highly prized *souvenir* of a most skilled botanist, and a man eminent in science.

We have understood that the intrigues of a rival candidate for the curatorship of the Imperial Garden at Berlin defeated him from an appointment, which would have gained additional lustre from such an occupant, and induced his friends to make up this expedition to this country, with which, in some degree, to repay him for the discomfiture. Few at home, from the state of his health, expected him to survive the voyage, and if all that is said of them be true, whilst knowing this, they were heartless enough to expedite him on his travels. Being the favorite candidate of the High or court party, the fund to be made up was *intended* to be ample; but such friends are remarkably oblivious when not reminded frequently of their obligations; be this, however as it may, some drafts, which were honored in this country, we believe remain to this day unsettled. F.

SOCRATES. NO. II.

The philosophy of Socrates forms an interesting epoch in the history of the human mind. Although Thales, Bion and Anaxagoras delivered many excellent truths before him, he may be considered as the first teacher of ethical science. He has been designated by Cicero *(de orat. Lib. I. C.* 10), as the perennial source of philosophy. From him the fundamental points of the leading philosophic sects originally proceeded:

> "From whose mouth issued forth
> Mellifluous streams, that watered all the schools
> Of Academies, Old and New."

He acted, in a certain sense, the part of a physician for Greek philosophy about to perish from inanition, and his influence was felt even in schools which differed most materially from his ethical doctrines. He called philosophy from those obscure and intricate physical inquiries in which she had been involved by the founders and followers of the Ionic sect. He desired, that men should not entangle themselves in vain subtilities and fruitless investigations. He took correct views of the powers and wants of human nature, and turned his attention to that true philosophy, whose object is to enlighten the mind and improve the heart. His examinations were directed to the nature of vice and virtue, of good and evil: all science, which did not tend to the happiness of man, by regulating his conduct in society, was contemptible. He taught, as far as uninspired reason could teach, a true and spiritual religion. He believed most firmly in the existence of one supreme eternal and invisible God, omnipresent, omniscient, omnipotent, infinitely wise, just and good, who created the universe, governs the world, hears prayer, gives wisdom to those asking it of Him, and who will reward the truly pious, by the everlasting enjoyment of himself in a future life, and punish the wicked in an after state. Wrong should be avoided as odious to the divine nature, the beautiful, the good, the honorable and true are to be sought after and followed as harmonizing with the divine nature. The God he loved could only be served by sincere virtue; in whatever form worshipped, He looked not so much at the outward as at the inward state and habit of the soul; the heart being more regarded than the most costly sacrifices: alluding, on a certain occasion, with high encomium to an oracular response, which declared, that *God loved the thanksgivings of the Lacedæmonians better than all the sumptuous offerings of the Greeks;* he said: *It is absurd to think that the Deity, like a false judge, can be bribed by presents.* The duty of prayer he, at all times, inculcated, and he furnished his disciples with a most beautiful

and simple formula: *Great God! give us the good things of which we stand in need, whether we ask them or not; and keep evil things from us even when we pray to thee for them.* He also believed that a divine spirit (δαιμων) constantly attended him, rebuking him when he did wrong, and prompting him to do what was right. *Esse divinum quoddam, quod Socrates demonium appellat, cui semper ipse paruerit, nunquam impellenti, sæpe revocanti, (Cic. de divin.)* This was conscience, which has been pronounced by another, "God's vicegerent in the soul of man." But the doctrine dearest in his creed, upon which he loved so frequently to speak, is the immortality of the soul beyond the grave. He

> "With reasonings sublime,
> Half-pierced at intervals the mystery
> Which with the Gospel vanished and made way
> For noon-day brightness."

He entertained the opinion that a perfect example of human excellence would yet appear on the earth. He anticipated the advent of one of humble origin, yet of heavenly wisdom, who should be a divine teacher and yet a martyr to the truth. When treating of the divine man he seems to speak of the qualifications, life and death of the Saviour with almost as much clearness as Isaiah himself. "He will be a simple and ingenuous man, desiring not the semblance but the reality of goodness; for if he shall be thought to be just, he will have honor and reward; and thus it will be uncertain, whether he be just, for the pure sake of justice or the rewards and honors of it. Let him be stripped of every thing but his integrity; while he doth no injustice, let him have the reputation of doing the greatest; that he may be tortured for justice, not yielding to reproach or such things as arise from it; but may be immovable until death, appearing to be unjust through life, yet being really just. The just man being of this disposition will be scourged, tormented, bound, have his eyes burnt out, and lastly, having suffered all manner of evil, will be *crucified.*"—*(Plato's Rep.)*

The more we contemplate the character and sentiments of Socrates, the more we are filled with admiration of his excellence and eminence. But lest we should exceed the limits allowed us, we will conclude with a quotation from the writings of one of his pupils. "To me indeed Socrates was such a man; so religious that he would do nothing without asking counsel of the gods; so just that he would harm no man in the slightest thing, but render every assistance to all who sought it of him; so temperate that he never preferred pleasure to goodness; so sagacious that he seldom erred in discriminating the better and the

worse, and needed no man's assistance in making this judgment; in fine, he excelled all in the art of aptly and accurately expressing his thoughts, of exploring the sentiments of others, of convincing their errors, and inspiring men with virtue and honor, that he has seemed the best and happiest of men. If any think otherwise, let them contrast his morals with those of others and thus judge."—*(Mem. Socrat.)*

THORWALDSEN.

A sketch from the German.

Modern plastic art has no name of which it has so much reason to be proud as that of THORWALDSEN. Without him, in fact, it is doubtful whether our age could assert its claim to the production of any work of statuary of the highest order or destined to lasting fame. Without Thorwaldsen, we must think, that the question of the plastic calling of the moderns could have remained undecided. But he has answered it in the most glorious manner. Canova was confessedly the only modern, who could be mentioned before him and for a considerable time after he had commenced his lofty career; but the spirit of Canova was softness, and his works scarcely ever got out of the domain of painting, thus rather strengthening than refuting the idea of the unplastic character of modern art. Thorwalden, however, had this great advantage over Canova, that he came after him. Canova's statue of Pope Rezzonico had been finished some time before Thorwaldsen can be said to have had a clear consciousness of his calling, when he formed his first model at Copenhagen, for which he received the scholar's medal; and when he commenced his studies in Italy, taste for the arts, which Canova found so rude, had already by his influence taken a higher direction, returned to the long neglected study of the antique models, and deserted the unnatural statuary of the eighteenth century. No one more willingly or more gratefully acknowledged these services of his illustrious predecessor than did Thorwaldsen.

It is said that Thorwaldsen was descended in a pretty direct line from the Danish King Harald Hildetard, and that one of this race, Oluf Pan was not only a powerful chieftain, but likewise, according to the songs of the Skalds, endowed with great taste for works of art. According to other statements, one of the collectors of the Eddas was an ancestor of Thorwaldsen. It matters not how much truth there is in these legends, for the muses weave their chapters of glory from the leaves of the laurel, not of the genealogical tree. Certain it is that Thorwaldsen bore the stamp of a northern nature of the purest and loftiest character.

His figure was stately, not too large, distinguished by its powerful build and noble bearing, in perfect harmony with the earnest, impressive, but naturally plain expression of his face; the lines and movements of his mouth showed a certain susceptibility of tender emotions, but the most attractive feature was his clear blue eye, whose sparkling glance was full of poetry, and at the same time expressive of a clear and penetrating mind. His dress was of the simplest fashion, and yet when he entered society, he was one of its brightest ornaments. But he was not fond of large parties, avoided them as much as possible, and sought in preference the smaller circle of a few friends or acquaintances.

I had from his own mouth the following sketch of his early history. He was born at Copenhagen in 1770, the son of a poor carver of figure heads and ornaments for ships. He spent his earliest years in assisting his father at his business, and attracted no notice until he was twenty years of age. At that period he succeeded in gaining several minor prizes for models in plaster, and finally, in his twenty-third year, the chief prize awarded by the Danish Academy of Arts, to which he had been sent for the purpose of study. With this prize a stipend for travel was connected, but he was not in a situation to avail himself of this at once, as his literary attainments were very limited. He therefore spent several years in reviewing and extending his studies, so that he had reached his twenty-seventh year before he set out on his journey for Rome. It is characteristic of his genius that he commenced his studies in Rome with the Quirinal Dioscuri, and this may be considered as the true school of Thorwaldsen, for it was here that he received the idea and formed the model of his first important work, Jason. A wealthy English gentleman, Mr. Hope, (a name full of good omen for the young sculptor), entering his work-shop, ordered the work in marble, and paying a very handsome price for it in advance, became the most efficient benefactor of the artist, who, embarrassed by want, was just upon the point of leaving Rome to return to Denmark. Extricated from pecuniary difficulties, he remained at Rome, and went to work full of courage. Henceforward his life presents no events of any interest apart from his profession. His Jason was the forerunner of a whole series of heroic and Olympic forms, which gradually elevated the reputation of the artist higher and higher until, in 1811, he reached the summit of his fame by the production of his great basrelief, the triumphal entry of Alexander into Babylon. By this most glorious and most classic work of modern sculpture, Thorwaldsen became *the* artist of the age. As such he was greeted by his country, when in the evening of his days, be returned home to Denmark. The whole nation arose to meet him, and to welcome him; they

bestowed not merely homage and honor, but thanks and submission. The Danes, not last in the ranks of literature and science, were yet unused to such national glory in the domains of art. "Thorwaldsen" was the redemption of national pride, and the bond of patriotic union. His funeral was celebrated with the same elevated feelings, when only a few years later, on the 24th of March, 1844, he met a sudden, but peaceful and happy death.

Thorwaldsen took but little part or interest in the affairs of ordinary life. Fame was his grand passion. He devoted himself entirely to his statues, and, though one of the most modest men in the world, defended the productions of his chisel with the most lively interest. Of course, he was quite susceptible to criticism, as every artist and man of genius is said to be. It has also been intimated that he was influenced by a much lower passion, avarice, but not only his numerous acts of charity and generosity, but much more the noble donations, which he made to his native city, are a sufficient refutation of this charge. He early bestowed upon it not only some of his finest productions, but likewise a splendid collection of pictures, medallions, mosaics and other treasures which he had partly purchased and partly had presented to him by his numerous friends and admirers. This charge of avarice, however, originated in the retired habits, and plain and simple mode of living adopted by the artist. He was never married, but adopted a neice, to whom he was very much attached; and he was very domestic in his habits. He seemed never to think of conveniences, much less of show or ceremony. If you rang at his door he would often come to it himself, and a friend was always sure of a cordial reception. In winter, you would find him in his night-gown, his feet wrapped up in warm slippers, in a room of moderate dimensions, warmed (in Italy) only by the heat of the sun, where he worked at his plaster models. It was only now and then that he was to be found in his work-shop in the Barherini palace, where the casts of most of his statues and basreliefs were set up, and which was one of the finest places to which visitors at Rome turned their steps. But if you found him in the midst of this world of his own creation, his criticisms upon one object and another satisfied you that he was not unaware of the differences between his productions nor of the faults of some of his works; here he rose to the height of artistic dignity, and laid aside all the littleness of variety. Most remarkable upon such occasions was what he said of his statue of Christ; in this he professed to have reached the zenith of his art, yea, almost to have fulfilled the mission of his life as an artist. He seemed to insist upon the recognition of this work, as though he had some internal doubts

about it, or as though he did hot here, and in that region of art, to which this and the statues of the Apostles belonged, feel the wonted confidence of his genius.

As to our judgement of the relation of this man to his art and to his age; he went back to the ancient world and to the circle of ancient ideas and conceptions of the world. He became so great only because he, like the spiritually allied Winckelmann, reproduced the ancients with whose artistic conceptions his own were homogeneous.

But however much imbued with the spirit of antiquity, however classical in his taste and plastic imagination, Thorwaldsen still felt the power of that deeper truth in which he had been born, and strove to embody it and express it by his art. This is the origin of those works, Christ and the twelve Apostles, which he prepared for a church of his native city. His expression, "*I believe I have attained it at last*," uttered at the completion of his statue of Christ, are a proof how deeply he was impressed with the sublimity of the idea which he here strove to exhibit, and that he was never satisfied with his efforts may indicate the loftiness of his conception of the God-man.

Introductory Lectures delivered at the Opening of the Course in Pennsylvania Medical College. Winter of 1845 *and* '46.

The lectures of Drs. Atlee and Wiltbank remain to receive our tribute of praise. We freely accord to them a high degree of commendation. They are both eminently worthy of an attentive perusal, and cannot fail to impress the reader favorably in regard to the enlightened judgment, and professional attainments of their authors.

Dr. Atlee, the Professor of Chemistry, has selected as his theme, the Chemical relations of the Human Body with surrounding agents. To say that he has handled it well would be inadequate praise. we think it has been discussed admirably, and is adapted to be profitable both to the head and heart.

Chemistry has made rapid advances within a few years; it is indeed adding every day to the riches of its spoils. Cultivated extensively both in Europe and America, employing some of the best minds on earth, it is exploring the extensive field opened to it with unexampled brilliancy and success.

Organic Chemistry is advancing with rapid strides, and new light is continually thrown on animal processes and the relations of external objects to the operations of the animal economy. Dr. Liebig, an eminent

German Chemist has rendered himself illustrious by his discoveries and inductions in this department, and if he has not always secured approbation for his speculations, he has unquestionably contributed largely to the advance of Chemical Science.

Dr. Atlee, making use of the discoveries of this eminent Chemist, shows what are the agents, what is their composition, and which are related to the nutrition and support of animal existence. Some of them are adapted to renew the waste of vital operations, to resupply the loss in the various structures of the body. They are the nitrogenized food, or as Dr. Liebig calls them—the plastic elements of nutrition. They alone are supposed "capable of conversion into blood, and of assimilation to the various organs and tissues, and containing a peculiar principle, called proteine, essential to existence." There are the non-nitrogenized, or "elements of respiration, and are supporters of respiration and animal heat."

Says Dr. Atlee, "although this peculiar principle, proteine, exists in the plastic elements of nutrition, it has no separate and distinct existence in organic structure, but is associated with mineral and organized substances, constituting fibrine, albumen, and caseine, the so called proteinaceous or nitrogenous aliments. Proteine, consists of carbon, hydrogen, nitrogen and oxygen. Add sulphur, and we have Caseine. Add sulphur and phosphorus, and Albumen is the product. Réduce the quantity of sulphur in the albumen, and Fibrine is formed, so that proteine is the base of all these alimentary principles."

In these substances, or their elements, constituting nitrogenized food, we have the constituents of the human body, except fluorine. "Pereira," says Professor Atlee, "is of opinion that if fluorine is a normal constituent of the body, it is introduced into the system in the small portions of the bones of animals occasionally swallowed with their flesh, Berzelius having detected minute quantities of fluoride of calcium in the bones of animals."

The importance of proteine is very great. On it depends the organic structures—"the organic nitrogenized constituents of the body—which are formed from it by the agency of oxygen or the elements of water, and by resolution into two or more compounds." The question become interesting: What is the source of this proteine, which plays so important a part in the animal economy?

Here we will let our author speak: "Recent researches of Chemical philosophers have disclosed the beautiful and important fact, that the proteinaceous compounds are alone produced in the vegetable organism, and that the various tissues of the animal body depend for their forma-

tion upon those vegetable principles, their developement being aided by the action of other chemical agents and the vital force. How peculiarly interesting is this connection between two of the great kingdoms of nature! How perfectly adapted are the works of creation to one another! In confirmation of the fact that proteine is the base of organic structure, Liebig refers to an egg during the proces of incubation. Feathers, claws, globules of blood, fibrine, membrane, and cellular tissue, arteries and veins are produced from albumen, a proteinaceous compound, merely by the action of the oxygen of the air."

The non-nitrogenized articles of food are allied in their composition to fat, and supply this in the body. It only requires a loss of part of the oxygen to effect it.

The other external agents needed are water and air. The first is absolutely necessary—the human body contains nearly 75 per cent of its weight of water. It may be, in addition to its other uses, nutritive, consisting as it does of hydrogen and oxygen, and may contribute to the formation of the tissues.

The air of the atmosphere, and particularly the oxygen of it is shown, and the interesting statements are terminated with the following fact: "Thus the body is continually balanced; food enters the stomach, is digested, assimilated, and carried to every part of the body to be converted into organic tissue, but it cannot accumulate; oxygen enters the lungs, is absorbed, and also carried to every part of the body to act upon the already used particles of this food, and it cannot accumulate; the elements of the former chemically unite with the latter, and both pass out of the system together, leaving it just as they found it, to be followed by their successors in the same round unceasingly, until the vital power yields up the body wholly to their destructive influences."

There is a species of combustion carried on in the body, on which animal heat depends, the fuel of which is furnished by the carbon and hydrogen of non-nitrogenized food. The waste of oxygen by respiration and other processes, which might appear to threaten a great disaster, is counteracted by the vegetable kingdom, which resupplies by its processes the loss. Thus is there a beautiful adaptation of external agents to animal wants, and a continual circulation is going on, of needed agents into the body, and back again to renew the supply.

The reflection, which connects itself with all this, and it has not escaped our author's eye, is that there is a beautiful adaptation of external things to man and of man to external things, a striking display both of the wisdom and goodness of God. The whole discussion adds an instructive and attractive chapter to our natural theology, and might pro-

fitably be connected with the next edition of the able work of Paley, on that subject. "How beautifully simple," concludes Dr. Atlee, "is the order of this whole arrangement! A few elements competent to subserve such manifold and apparently opposite purposes! To what simplicity does such a view reduce the complex system of the world, bind down the products of organic nature under all her different forms, and oblige her to confess her real essence and divine origin!"

The lecture of Dr. Wiltbank, in real merit, is not inferior to the others. It is indeed a truly excellent and ornate expose of its subject. This, however, being less suited to our pages than the others induces us to pass it with this general notice.

In conclusion, we cannot refrain from an expression of our entire confidence in the faculty of Pennsylvania Medical College. Thus far they have been prospered in their infant enterprise; the future remains to be disclosed. In the multiplication of Medical schools, there may appear to be danger; it may be found that those that are yet weak, may never become strong, but whilst deprecating this multiplication, and believing that it must be injurious, we venture to predict, that Pennsylvania Medical College, will, as it surely ought, hold on its way, and it will prosper. In it are elements, which, we sincerely believe, must conduct it to a fortunate issue. So may it be!

THE LINNÆAN HALL.

It will, no doubt, be gratifying to those interested in Pennsylvania College, to learn that active preparations are now making for the erection of an edifice to be appropriated to the *Museum* of the Linnæan Association. The building has already been part under contract, and the foundation dug, and it is expected, that the Hall will be ready, in the course of the year, or early in 1847, for the reception of the valuable and increasing collection of minerals, shells, birds, quadrupeds, reptiles, insects, fishes, coins, fossils, &c. &c., secured by the industry of the Members and the liberality of our friends. Its completion will be a grand era in the history of the Linnæan Association, and hailed by all with the greatest satisfaction. The Hall will not only be an honor to Pennsylvania College, with which it is connected, but an enduring monument of the zeal and perseverence of the young men who compose the Association.

Our object, however, in introducing the subject, at present, is to state for the information of our friends, at a distance, that the ceremonies connected with the laying of the Corner Stone, will occur some time in July next. His Excellency, George M. Dallas, Vice President of the United States, and Prof. S. S. Haldeman, have kindly consented to deliver addresses on the occasion. From the high reputation which both these gentlemen possess, quite a rich intellectual banquet may be anticipated. We shall be very glad to see all our friends, who can make it convenient to attend, unite with us in the celebration. S.

SCIENTIFIC MEMORANDA.

The Comet of Comets.—The return of Biela's or Gambart's comet to its perihelion has been marked by a circumstance unparalled in the history of these bodies. Not only has it verified with the greatest precision the predicted period of its return, but it is to all appearance accompanied by a satellite, bearing in every respect a likeness to its primary, and moving in such a manner as to indicate such a relation between them. Observation has not yet settled the question of the precise nature of their relation to each other, and we await with great impatience the result of those further observations, with which Lieut. Maury has promised to furnish the public.—S. W. M.

Another Comet.—A new telescopic comet was discovered, on Thursday night, Feb. 26th, by Mr. Pond of Cambridge University. It is in the same quarter of the Heavens and not very remote from Biela's comet mentioned above.—S. W. M.

Double Stars.—Prof. Mitchel of the Cincinnati Observatory announces the binary character of Antares, and also of one hundred and fifty others; many of them lying further south than the observations of European Astronomers can reach.—S. W. M.

Eclipse of the Sun.—On the 25th of April, there will be a partial eclipse of the Sun. The degree of obscuration will be about five digits in Illinois, nearly seven at Boston, eleven in Florida, and on the Island of Cuba it will be central and annular. This will be the last Eclipse visible here until May 26, 1854.—S. W. M.

"*The insect scourge.*"—Advices from Cuba state that the Orange, Lemon, and every tree of the citron kind in the district of Matanzas and other parts of the Island are perishing under the attack of insects in shape like a flea, which light upon them by myriads.—S. W. M.

Tale of Worms.—Rev. Isaac Davis, brother to the Mayor of Boston, in a communication to the Congregational Journal, Concord, N. H. writes as follows:

"On the 1st of December, returning from Pierpont, I saw on the snow which had fallen during the night, what I supposed to be oats sown broad cast. To my great surprise, I found them on examination to be living worms about an inch long lying on the top of the snow by hundreds, and scattered along the road for not less than five miles. There were no trees near from which they might have been shaken, and if they had, they must have been frozen for the ground was frozen hard before the snow fell. But the worms were alive, for they coiled up when I took them in my hand. They were of a brown color, with 12 to 16 legs.—S. W. M.

Lead Deposits have been discovered on a branch of the Trinity River, west of Dallas, in Texas. The extensive region extending from the Trinity to the San Saba Valley is supposed to contain valuable lead mines.—S. W. M.

A vast and beautiful Cave has been discovered near Middletown, Va. it has been explored for half a mile.—S. W. M.

Pennsylvania College, Gettysburg, Pa.

PENNSYLVANIA COLLEGE has now been chartered about fourteen years. During this time its progress has been such as to gratify the most sanguine expectations of its friends. The course of studies is as extensive and substantial as that of any Institution in the Country. The *Preparatory Department* provides for instruction in all the branches of a thorough English, business education, in addition to the elements of the Mathematics and Classical Literature. The *College Course* is arranged in the four classes usual in the Institutions of this country.

The government of the students is as energetic as their circumstances seem to require. They attend at least two recitations a day, Church and Bible Class on the Sabbath, and are visited in their rooms so frequently as to preclude the danger of any great irregularities. It is believed no Institution in the United States has more exemplary young men in connexion with it. They are all required to lodge in the College Edifice, special cases excepted.

The annual expenses are—for board, tuition and room-rent, during the winter session, $61 87½; for the summer session, $41 87½. Washing, $10 00; and Wood, $3 00. Total expense, $116 75. Boarding can be obtained in town at $1 25 per week.

There are two vacations in the year, commencing on the third Thursdays of April and September, each of five weeks continuance.

Acknowledgements of Donations to the Cabinet of the Linnæan Association of Pennsylvania College.

April, 1846. From *Rev. R. Weiser*, a package of Porcupine Quills, colored by the Sioux Indians.

2. From *Daniels and Smith*, Philadelphia, 1 Vol. in MS. "Le Secret des Secrets."

3. From *James Renshaw, Esq.*, a Fac Simile letter of Washington written 3 months, 15 days before his death.

Receipts during March.

M. M. Yeakle, Baltimore,	in full.	
J. W. Slagle, "	"	
Jacob Medtart, " per Prof. Hay,	"	Vol. 1st.
M. Diehl, Gettysburg,	"	
Wm. Ruthrauff, "	"	
Levi Miley, "	"	
Joshua Evans, "	"	
Peter Anstätt, "	"	
H. C. Eckert, "	"	
Rev. Prof. Hay, "	"	
" Jno. Ulrich, Petersburg, Pa.	"	
Dr. Wiltbank, Philadelphia,	"	
" Patterson, "	"	Vol. 1st & 2d.
" Darrach, "	"	
" Atlee, "	"	
" Grant, "	"	
C. A. Heinitsh, Lancaster,	"	
Samuel Etnyre, Leitersburg, Md.	"	Vol. 1st & 2d.
Rev. J. P. B. Sadtler, Pine Grove,	"	
" J. Few Smith, Winchester, Va.	"	
" N. H. Cornell, Deleware co. Pa.	"	
" C. Culler, Funkstown, Md.	"	
" G. Bassler, Zelienople, Pa.	"	
Victor L. Conrad, Pine Grove,	"	

VOLUME II.] [NUMBER 7.

THE

LITERARY RECORD AND JOURNAL

Of the Linnaean Association of Pennsylvania College.

MAY, 1846.

CONDUCTED

By a Committee of the Association.

CONTENTS.

1½ sheet, periodical—Postage, 2½ cents, to any distance within the Union.

NEINSTEDT, PRINTER, GETTYSBURG.

THE LITERARY

RECORD AND JOURNAL

OF THE LINNÆAN ASSOCIATION OF PENNSYLVANIA COLLEGE.

Vol. II. MAY, 1846. No. 7.

LINNÆI-ANA. NO. I.

Linné, like all other naturalists frequently made scientific tours, taking with him a number of assistants. He could well afford to employ such men, for the expenses were usually paid by the government of Sweden or some distinguished noblemen, who were patrons of science. Most naturalists in our day, especially in our own country, are obliged to go alone, or to be contented with one assistant at most, to carry hammers, gun, nets, bags and other indispensible paraphernalia.

I will give an account of one of the great master's expeditions, or rather the outfit of it, and it will be seen that he traveled like a prince surrounded by a brilliant court. In 1734, he made a tour over the Swedish Province of Dalecarlia, at the expense of Baron Nicolas Reutherholm. (I love to see the names of these Macænases in capitals. May their memory be blessed!) A number of students requested permission to accompany him. It was indeed a high privilege, and no wonder the number of applicants was large. He selected seven of the most able and zealous, and thus established a sort of caravan of naturalists. He enacted certain laws and regulations, for the due observance of which every member of the corps made himself answerable. Linné, of course, was general of the whole expedition, and enforced his laws with precise rigor.

The following is a list of the names, with the appropriate department of each, and it will be seen that scientific duties, debasing drudgery, religious functions, and menial services are all curiously blended.

Nahemann was to act as geographer; to give an accurate description of all the villages, lakes, rivers, roads, and districts; to read morning and evening prayers, and to preach on Sundays.

I like this latter feature, for naturalistsof all men should be most truly devout; their pursuits constantly bring them in close communion with the great God of the Universe, and an undevout naturalist is mad.

Clewberg was to make observations on the four elements, as they were then called; such as on the quality of the water, on mineral springs, on the snow which never melts on the Alps in summer, on the height of the mountains, the weather, the fruitfulness or sterility of the soil, &c. He was also charged with drawing up the report of the whole corps.

Fahlstedt was appointed metallurgist; besides collecting minerals, earths, petrifactions, &c. &c., he was *hostler* of the expedition. It was his business to feed, saddle, harness, water, clean, and shoe the horses. The geologist a groom! Buckland, Mantell, Silliman, and Hitchcock, what say ye?

Stohlberg went as botanist; he was to examine and collect and describe all the trees, plants, herbs, grasses, and fungi. He was moreover quarter-master general. It was his business to procure good lodgings; to buy meat, and poultry, flour, and all other good things. He bargained with the peasants for their best rooms, and, no doubt, sent the owners into the stable, or if they were obdurate, made a contract for the softest and cleanest place in the barn for his own master and companions. A very dignified employment for a botanist!

Emporelius was the zoologist. He was to describe and figure the quadrupeds and all other animals, fishes, birds, worms, insects, &c. &c. He had a collateral occupation, and must have been a sort of adjutant to Stohlberg, for it was his business to shoot the game and to catch the fish that were necessary for the subsistence of the company.

Hedenslad, was the economist; he was to examine the dress of the Laplanders, their dwellings, their mode of preparing provisions, their matrimonial and funeral rites, their knowledge of medicine, their mode of living, diet, &c. &c. His additional employment was to act as aid-de-camp to the general, to communicate his orders, to ease the other men together whenever required, to summon them into the presence of the master every evening to give an account of the proceedings of the day; he was also to see that every man was in bed at the proper time, and up again in the morning at the appointed hour. So that poor Hedenslad himself was last in bed and first out, rousing up his drowsy associates! We know a *few* men whom this office would not have suited!

Sandel, a *Pennsylvanian* by birth, (what took him to Europe one hundred and twelve years ago?) was Steward and Treasurer. This was the most responsible of all the offices, and it is a compliment to Pennsylvania that he was chosen. He must have acted in connexion with Stohlberg; probably Stohlberg made the bargain and Sandel paid the

money and kept the accounts. It appears that there was no other employment connected with that of treasurer. It is enough of itself.

Owing to these excellent regulations and their punctilious observance, the tour was continued and terminated with the greatest ease and convenience. When the President discovered a village, it was not necessary for all the company to ride thither, but the geographer alone was sent to enter it. If some particular mineral or fossil was found in the way, the geologist was directed to alight; at the sight of some curious plant or insect the botanist or zoologist did his duty: they took the respective objects with them, and prepared a description to be inserted at night in the transactions.

At night they all met together. The President then dictated to the Secretary the memoranda collected by each naturalist, beginning with the geographer and ending with the steward.

Many valuable discoveries were made during this tour, all of which have been printed in various works. This is but a sample of many expeditions which the illustrious Linné made, the fruits of which the scientific world will enjoy to the end of time. J. G. M.

GEOLOGY. NO. III.

The great Coal Measures

In the last number of the Journal, *fossils* or the remains of animals and vegetables, which are found extensively distributed, and existing in considerable abundance, were adduced as affording conclusive evidence of the comparatively recent formation of the rocks in which they occur. Their great interest forbids that they should not be passed over with that general notice. Some of them, at least, deserve a somewhat more extended examination.

5. Amongst these, *the great coal measures* or beds of mineral coal cannot fail to arrest the most lively attention of our inquirer into the structure and natural history of the earth, both on account of their vast extent and great utility to mankind.

Having ascertained the fact, that the stratified rocks maintain, in all countries, the same invariable relation to each other in the order of their superposition, we derive the important advantage from the knowledge of this fact that we know precisely where to look for any particular stratum of the series. That rock or stratum, for instance, which is below another, in one region of country, is below the same every where else, except it should be where the folding of strata may have produced a *local* inversion. Beds of coal have likewise their fixed place in the as-

cending series of rocks. Their proper place is immediately above the *Millstone grit.* Should this stratum be wanting in any particular locality, the coal series will be found resting upon the rock next below, which is a well characterized limestone, by some called Transition or Mountain Limestone, or should this be wanting also, then they would be found resting upon the Old Red Sandstone, which is next below the limestone.

If the inquiry should here arise, how may we with certainty know that the stratum under examination is the Old or the New Red Sandstone, or that the limestone is the Transition or Mountain, or some one else of the numerous limestone formations, which occur in the great series of strata, &c.? It may be observed that a little examination and comparison will satisfy us that each formation may be readily distinguished. (1) by its lithological character, that is, by its composition, structure, and appearance; and (2) by the fossils which it contains; each member of the series having organic remains differing, either in whole or in part, from those immediately above or below it. This second characteristic is even more to be relied on, when the fossils are present, than the first. The Millstone grit, is however easily recognized by its lithological character alone. It consists of rounded quartzose fragments, of various sizes, from that of a walnut down to that of ordinary sand, firmly cemented together.

Now the use which we may make of this information is, that we can by it determine whether, in any particular region, coal may or may not be found. If, for instance, the Millstone grit, or Transition limestone, or Old Red sandstone, or any of the rocks, which occur below the coal series, be the surface rock, then it is in vain to expect coal there, and any search for it would be folly. Thus from A to B, as also between C and D, (see figure in No. II of the Journal of the last month), no coal can be found, because the inferior rocks rise to the surface, and the uppermost even of these are washed away from the intervening summits. Hence some of the highest ridges of the Allegheny mountains are destitute of the coal measures, which are to be found both on the East and West of them; and the whole of the State of New York is alike destitute, the series of strata ascending in passing southward, until the coal is met with on the borders of Pennsylvania. By a proper attention to these facts the expenditure of much time, labor and money, in a vain and fruitless search may be avoided.

But it is by no means certain that coal may be found, even if the higher members of the series be at the surface; for each stratum is not always present in every locality. Further search will be necessary to

ascertain whether coal may or may not be found by digging, &c., or whether, if found, it be of a good quality and will justify the expense and labor bestowed in getting it out for use.

One of the most interesting circumstances in reference to this mineral, so valuable, and, in the present state of the arts and manufactures, so essential to man, is its extensive distribution. It is found principally between the latitudes of 30° and 60°, in North and South America, in Europe, and in Asia. One of the most extensive coal fields in the world is that of the United States, extending from Eastern Pennsylvania, with some slight interruption in Ohio, to Indiana, and from New York to Alabama; being about eight hundred miles long, and two hundred to four hundred miles wide. In the eastern part of this field, it is of the variety called Anthracite, being hard and burning without flame; in the western part it is soft, bituminous, and burns with a bright flame. This difference in the character of a mineral, evidently belonging to the same deposit, is ascribed, by some, to the contignity of igneous rocks, in the East, by which the more volatile parts were driven off, and by Lyell, to the difference of inclination of the superincumbent rocks, which, being nearly horizontal west of the Allegheny range, would not as easily permit the hydrogen and carburetted hydrogen to escape, as on the East, where the seams and strata are nearly vertical. The decrease of volatile matter in the coal with the increase of the inclination of the strata renders this opinion highly probable; although it favors the first named opinion no less, for, the disturbance having been greatest where there was the greatest action of the subterranean heat, the sublimation of the volatile matter would be most readily effected there. Formerly it was supposed that the differences between the several kinds of mineral coal were due to a difference of age, or that they marked different eras in the earth's history. But now they are found to be mainly referable to local causes; the great coal fields all over the earth having been formed under substantially the same circumstances, and during the same geological period.

In confirmation of this opinion it may be remarked, that, not only do they occupy the same position in the geological series, but, what is still more remarkable, they, with slight exceptions, contain the same fossils both animal and vegetable, showing a remarkable nearness to identity of the *flora* and *fauna* all over the earth at the period of their formation. The reason of the occurrence of the workable coal beds entirely or principally in the present temperate zones is probably to be found in the great and continued heat of the intertropical belt, producing the rapid decomposition of the vast and luxuriant vegetation, which it

caused, and thus preventing the formation of coal, and in the low temperature of the higher latitudes being unfavorable to vegetation.

Another important fact, which may be noticed in reference to the subject before us, is the *vast amount* of this mineral treasure, which is found imbedded. There are in general several workable beds, varying from a few inches to six and eight feet in thickness, and sometimes, where several run into one, to fifty and sixty feet. When now we take into consideration the vast extent of the coal field of the United States, of that of England and Wales, of those of France and Germany, of those of Asia and New Holland, and of other minor ones which we have not named; and further remember that the most of these were once much more extensive than they are at present, their boundaries having been contracted by the action of powerful water currents, we are struck with astonishment at the vast quantities of vegetable matter, which was once imbedded, and which even yet remains in the almost inexhaustible beds of mineralized carbon.

Its value to mankind as fuel, both for domestic comfort and manufacturing purposes, is incalculable. It is difficult to conceive how the north temperate zone could long remain the seat of a dense, civilized, active and enterprising population, how it could long maintain its preeminence over all the rest of the world in the arts and sciences without the possession of these mineral treasures. The forests must soon fall before the axe of the woodman, and being consumed leave society bereft of those vast means of industrial operation at present at its command.

LETTERS TO A FRIEND AT COLLEGE. NO. I.

My Dear Amicus,

You wonder at my long silence, and complain that my letters come more and more "like angels' visits, few, and far between." But I assure you that this is no less a source of regret to me than to you, and nothing but the pressing nature of my engagements prevents me from inflicting upon you a weekly epistle. But if you will turn to the account, which I some time since gave you, of my pedagogical labors, you will perceive that I am engaged from "rosy dawn 'till dewy eve," as Homer, I believe, phrases it. To teach the "Classics, Mathematics, Natural Philosophy, Belles-Lettres, English," and all the *et ceteras* of a Maryland Academy, requires in one like me, who have just finished my College studies, a steady industry of which I am afraid you have no idea. I do not speak of the time spent in school, though from six to eight hours *per diem* is no trifle either, but the *preparation* for these multi-

plied studies takes up about as many hours besides. "What!" you will exclaim, "you the foremost scholar in our class, talk of having to study the elements which you are now to teach! Why, my dear fellow, do not let this get out or it will destroy the credit of our College." I hope not. It surely cannot be expected that a youngster, who has just graduated, should have the perfect accuracy and universal knowledge of a Professor of ten years' standing. And nothing less than this is, in my opinion, sufficient for the proper discharge of the duties with which I find myself here invested. I am here called upon to teach precisely the same things that make up our College course, and even if I had but the elements of these various sciences to teach, I suppose it would require a perfect familiarity with all their details to do it intelligently.

Yet even if I were found incompetent to my task, I do not admit that it would reflect any discredit upon my "*Alma Mater.*" That she, through our revered Professors, did all, and more than all that was necessary to prepare me for this or any similar post, both you, and I, and all her ingenuous sons can testify. A brilliant array of her pupils and graduates in all the professions, and in every honorable and useful walk of life likewise proves, beyond a doubt, that she is by no means stinted in her communications of knowledge, nor dwarfs the intellect committed to her training. And how unreasonable to hold an institution responsible for all the indolence, stupidity, and perverseness that it could not cure, and for mental abortions that it could not transform into men.

Enough, however, of myself; let me return to you and your letter, which, though so welcome, contained some things that have made me sad. You speak of being "tired of College, and anxious to get out into the world." When I read this I could not help thinking of the lines of Virgil as more appropriate to students than to farmers:

> "O fortunati nimium sua bona si norint
> Agricolæ."

Allow me to use the liberty of a friend and to express my fears that you are far from appreciating the advantages and privileges of your present position. Believe me, I speak from experience. I know how frequently the feeling to which you give utterance has disturbed my peace and turned my mind aside from its appropriate employments. Students often regard their College course as a term of imprisonment, to which they have been sentenced by cruel friends, and where Tutors and Professors are a kind of jailers, whose business it is to keep them at hard work, and rob them of any little alleviations of their bitter lot, which they from time to time devise for themselves. Such, I must confess, was often the color of my thoughts.

But my present situation and reflections upon the seven years of my Academical course, from the ferule of a disciplinarian of the old school, up to the mild admonitions of our venerable President, or the sharper animadversions of some of our Professors, have satisfied me that I am never again to be so favorably situated for the attainment of the highest degree of enjoyment and happiness as I was at College. As I see you, even across the South Mountain by which we are separated, raise your eyebrows and shake your head, I must, I suppose, argue the question with you in due form. By answering the two following questions, I shall endeavor to prove that you are, or ought to be, one of the happiest fellows upon earth:

1. *What is your object in entering College?*
2. *What is your situation when there?*

1. You have entered College for the purpose of *study*—to lay the foundations of knowledge—to make yourself acquainted with the principles of things. Study, habits of study, fixed attention to the nature and laws of things, is certainly one of the loftiest attainments which the mind of man can make. Compared with this the mere knowledge of facts is of but little consequence. A fact separated from its cause possesses small importance. How many generations had seen fruit ripen and apples fall before Sir Isaac Newton? But it remained for his philosophic mind properly disciplined and intent upon referring the effect to its cause to deduce from this the laws by which the material universe is controlled in its motions. Fichte* well observes in the style of the transcendental philosophy: "Philosophical knowledge, such as we are now seeking, is not satisfied with answering the question, What is? Philosophy asks also for the How, and, strictly speaking, asks only for this, as that which is already implied in the What. All philosophical knowledge is, by its nature, not empiric, but genetic,—not merely laying hold of existing being, but producing and constructing this from the very root of its life." It is undoubtedly the object of study, to obtain this philosophic knowledge and thus to penetrate into the arcana of the universe.

Do you say, No, it is only my object here to prepare myself for a profession—for the practice of law—for making a living, and becoming influential and respectable among my fellow men? True, you may study for this object, and others for similar ends, but if you do not pursue truth for the love of it, if you do not in all your studies habituate yourself to look at, and to endeavor to understand that which is true, and the great truth lying under and behind all semblances, you will never

* Nature of the scholar, Sect. I. p. 128. (Smith's translation.)

be fitted to practice any profession. You design to practice law, and are to be engaged in the administration of justice; but how can you secure justice to your client, unless you know what justice is? You have your array of facts, and the opposing counsel has his conflicting array of facts, and how are you to clear away the dense clouds of ignorance and of error from the minds of your empanneled jury unless you can show the true relations of all these seemingly inconsistent facts with the eternal principles of truth and justice? So with the theologian; unless he can penetrate beyond the mere letter into the spirit of religion, and can rest his faith upon its unchangeable realities, he must ever remain a novice liable to be "cast to and fro and carried about with every wind of doctrine," floating as a weed upon the boundless sea of speculation, unable with his short line to reach the ground in which the anchor of his hope may repose.

Now the mind must be disciplined for study. Do you not see it every day whenever you attend recitation? What is the reason that some members of your class habitually acquit themselves so wretchedly? Why is it that they fail to answer some of the plainest questions that are proposed to them in any of their studies? Some, you will say, have not studied. But why have they not studied? Because they cannot fix their minds upon the subject or the book that is before them. Nay, some will tell you that although they have read a proposition in Geometry, or a demonstration over and over again, they do not understand it. Yet you have known a child of ten years of age, to whom the same thing was as clear as the noon-day sun. What is the cause of this difference? Not any organic difference in the minds of those who appear so vastly different in their mental ability. "It is notorious," says Dr. Arnold, in one of his lectures,* "that minds of equal power are most unequal in their practical efficiency, and that many persons with considerable talents and favorable opportunities are unable to avail themselves of either to any good purpose, because the cultivation of their mind has been wholly neglected." And what is this cultivation that is possessed of this wonderfully invigorating power? Why, manifestly, that ability of the mind to grapple with and to understand the subject presented to it by which it makes the thought, however conveyed, its own. Mere memory is not sufficient for this; for, as is often seen, memory may take only the words without reaching the idea. Study is more than memorizing. It is more than acquiring the ideas of another. It is the incorporation of those ideas with our own, so that we can not only reproduce them when we have occasion for them, but can trace them

* Miscellaneous Works, p. 297, Am. Ed., 1845.

out in all their connections and draw from them all those conclusions which we draw from our own. Study is the highest exercise of our reasoning powers, and it is on this account that I have ascribed to it such high dignity. To be sure, this is not attained at once. It is a progressive work, and it depends upon circumstances how soon we shall attain in it that perfection at which it aims. We commence it in our infancy, but if we do not go about it intelligently and industriously we shall descend to our graves without having achieved our task. And here is the answer to the question which we have asked about the apparent stupidity of some of our classmates; they do not apply their minds so as to penetrate beyond the very roughest exterior of the subject which is presented to them for their study.

But my paper is exhausted, and I must break off in the midst of what I was about saying to convince you of the immense advantages, which you now enjoy, for the acquisition of that most important of intellectual and moral habits—study; and I must abruptly close with the assurance that if you receive this homily patiently, I shall, in due time, inflict upon you a "second lesson," ever remaining,

Your attached,

PHILO.

SIBERIA. NO. III.

For fifty-two days, during the three months honored with the name of Summer, the sun never entirely disappears; it remains so near the horizon that his light is accompanied with but little heat. Except Winter and Summer, there is no distinction between the seasons; although the inhabitants, with that "amor patriæ" which burns as intensely in Siberia as in our own native land, pretend to point out Spring, when the sun is just visible at noon and the thermometer during the night is often −35°; and Autumn they refer to the first freezing of the river, which is early in September, with a temperature of 47°. During this brief season, a few little birds hail the opening Summer with their lively twittering, and a few flowers expand their petals. The stinted willows put forth a few wrinkled, semi-verdant leaves, and the plants bearing berries begin to blossom, when, not unfrequently, an icy blast from the sea turns the verdure yellow and destroys the bloom. In addition to this dreariness, and as if to rob the inhabitants of all the blessings of their only genial season, clouds of musquetoes darken the air, from which there is no refuge but in the pungent smoke of the *dymokuries*. These are large heaps of fallen leaves, moss, and damp wood, which when set

on fire, drive away the insects by their dense smoke. They are placed both in their pastures and near the houses, so that the inhabitants pass the whole of the musquetoe season in a cloud of smoke.

But every poison has its antidote; the ills of life are disguised blessings; and the musquetoes are a blessing to the Siberian, for they drive the rein-deer from the dense forest into the cool open sea coast, where he falls an easy prey to the hunter. In addition to this the musquetoes confine the horses, which graze in the large plains or *tundras* without enclosures, within the influence of the smoke of the dymokuries.

How, it may be asked, do the inhabitants of such a wretched climate live? To them there is neither seed-time nor harvest. The song of the reaper is not heard, nor the shout of him who treadeth the grapes. Here in truth vegetable existence has found its grave, and the earth in vestal innocence knows not to be fruitful. But this poverty of vegetation has been amply compensated by the rich abundance of animal life. The upland forests are filled with elks, bears, foxes, sables, grey-squirrels, and innumerable herds of rein-deer, whilst stone foxes and wolves roam over the low-lands. Immense flocks of geese, ducks, and swans arrive in the spring season seeking a moulting-place, whilst the snipe and the ptarmigan run along the low bushes and in the morasses. The ocean opens its inexhaustless store-house for their benefit, and brings within their control the monsters of the deep, from the huge whale, who, in his fury, lashes the sea into foam, to the herring, whose countless myriads annually visit these inhospitable shores.

From these seas so chill and ungenial, yet overflowing with a vast super-abundance of animal life, temperate regions are supplied. About January, immense bands of herrings break up from their frozen depths, and visit the various bays and rivers of the oceans, until July, when by an unknown impulse they halt and begin to retrace their course to their northern home. On their return to the ice of the north, which is effected during the month of September, immense shoals of them begin to ascend the now opened rivers of Siberia. Almost all the population then hasten to the favorite spots for catching them. Upon the supply thus taken depends in a great degree, not only their comfort, but their very existence. In the month of June already, are the rivers open for the operations of the fisherman. The larger species, as the sturgeon, a large kind of salmon, and a species called *tschir* among others, are then taken. Whilst the different fisheries are in operation, the swans, geese and ducks are moulting and bringing out their young broods on the lakes. As soon as the birds arrive, some of the fishermen are sent to watch their nests. At first a few eggs only are taken, which are

speedily replaced by others newly laid. The chase of the birds does not begin until they are moulting and unable to fly, when a great many of the fishermen leave the rivers and go to their breeding-places. Trained dogs are employed to pursue them, whilst great numbers are killed with guns, sticks, and arrows, several thousands have sometimes been taken in a single day.

Besides the stores of fish and fowl, good house-keepers provide themselves also with rein-deer meat. When the deer in large troops are in motion, during the Summer season, a part of the hunters proceed up the river Aninj in boats, whilst others, on horseback, go to the shores of the large lakes in the *Tundra*. The animals are driven by trained dogs into the water, and are killed with the spear as they are swimming. A skillful hunter on the Aninj may kill in a good season one hundred deer. The most favorable season to take the rein-deer occurs late in the Autumn, when they return in immense herds from the *tundras* or moss-plains, in which they have become fat, to their winter quarters in the forests. In good seasons the migrating body consists of many thousands, and, though they are divided into herds of one or two hundreds each, yet they press upon each other so closely, that they appear to form but one immense column. They always cross the river at the same place, choosing a situation with the most favorable banks. As each separate herd approaches the river, the animals crowd together, and the largest and strongest takes the lead. He advances, closely followed by a few others, with head erect, apparently examining the locality. When satisfied he enters the stream, and the herd crowd after him, and in a few minutes the surface of the river is covered with them. Upon this scene so interesting the hunters have have been gazing with intense anxiety from their lurking places to the leeward. Immediately they rush out in their light boats, and dash into the herd and despatch large numbers in an incredibly short time, whilst others surround the herd and obstruct their passage as much as possible. It often happens when the herd is large and gets into disorder, that their antlers become entangled in each other and then they become an easy prey to the hunter. A good hunter will kill one hundred or more in less than half an hour. He effects it, however, at great risk. The males with their horns, teeth, and hind legs offer considerable resistance, whilst the females seek to overturn his light boat which, if effected, would be followed by certain death. Yet such is the skill of these people that accidents seldom occur. "The whole scene," says Wrangell, "is exciting and curious in the highest degree, and quite indescribable. The throng of thousands of swimming rein-deer, the loud clashing of their antlers, the swift ca-

noes dashing in amongst them, the terror of the frightened animals, the perilous situation of the huntsman, the shouts of warning or of applause from their friends, the blood-stained water, these, and other accompaniments form altogether a spectacle, which no one can picture to himself without having seen it." In the preparation of birds, beasts, and fishes for their long season of inactivity, the inhabitants, rejecting salt, either dry them in the air, or smoke or freeze them.

The only plants and roots made use of are the wild Thyme and a farinaceous root called Makaischa. In addition to this, when the season is favorable, a few berries are gathered, during their brief Summer, which are preserved in a frozen state for winter use. When therefore the winter is unusually long or the season of harvest has not been sufficiently productive, want and starvation are the inevitable consequences. It is true that the Russian government has established a magazine for the sale of rye flour, but in consequence of the immense distance of transportation occupying two years, the cost of the article is so raised that the greater number cannot buy it. The introduction of steam navigation upon those large rivers would not only be an act of charity to the miserable natives, but would be a source of increased revenue to the government.

Besides the hunting and fishing, the Summer is the season to prepare the traps and snares with which the fur animals are taken. These furs constitute the only article of export, if we except the tusks of the elephant and rhinoceros, which are found in certain localities in immense quantities. Skill in setting a trap is highly valued, and the best fur-hunters are known far and wide. But those who are distinguished by success in the chase of the bear and elk are held in still greater esteem. Such warriors in truth are worthy of greater admiration, than they who have become distinguished for shedding the blood of their fellow men. The adroitness, courage, and strength shown in such encounters, are favorite subjects of conversation. Some of the stories related are truly extraordinary. Take the following as an illustration: "Two hunters, father and son, had gone out on horseback to hunt foxes; they had very poor sport, and were returning almost empty handed, when by accident they came upon a bear in his den: and though unprovided with proper weapons for attacking him, they resolved to attempt it. The father placed himself at one entrance of the den and stopped it with his broad shoulders, while the son, armed only with a light spear, attacked the animal at the other. More tormented than injured by the weapon, the bear sought to escape by the first opening, but neither his claws nor his teeth could pierce the thick, smooth, well-stretched, double, fur jacket

of the stout Juhakir, who kept his post until his son succeeded in killing his formidable adversary."

THE STUDENT'S MYSTERIES.

A quaint theme to descant upon. One full of grave import, that carries along with it something unexpressed and inexpressible.

You have never been in a student's room. Its door has never opened to give you admittance, nor closed to make you feel that you were really in the sanctum. You have never breathed the atmosphere laden with the oderiferous sanctity contained within its four walls, nor have your eyes ever opened upon its mysterious doings. Stand there, then, within the magic circle, while with goose-quill wand we dimly trace these shadows that dimly flit before us.

What constitutes a student? Had such a query been proposed in past days, the questioner would have been laughed at for his simplicity. But it is not so now; and we find the assurance for making the proposition, dear Reader, in the perplexed lines of your countenance, as again we ask, what constitutes a student? Such a sphynx-riddle never startled the ears of men, and alas, alas! there is no Œdipus! Think not, then, that we shall attempt to read it; no, there it is, a huge tangled mass of unknowables; of which, nearly all that can be understood, is understood, when we once more propound the question, What constitutes a Student? Yet we may talk about him. If we cannot decipher the lineaments, and follow out the minute ramifications, we may, as we before hinted, trace the utlines of the shadow, and speculate upon the length, and the breadth, and the depth. This much we know. If we take the definition of a Student, derived from the days of old, and apply it to the creature now bearing that name, we shall find that here too, "wearing grandfather's clothes" does not insure a neat fit. Particularly the head piece—that thing called a hat.—Is it a hat? Why fifty heads might have accommodation in that huge cavernous receptacle! Yes, fifty heads; and not find their brains the least incommoded for want of room.

Do you enjoy peeping through a key hole? For my own part, I have a superstitious dread of the act, ever since an amiable lady-friend of mine met her death in that manner; yet, as I see your eye glisten, and myself feel a slight return of that innocent curiosity, which, in common with my lamented friend before mentioned, I sometimes indulged in a pleasant way, I will venture with you for *your* gratification. There now, I'll just peep in a little, and, if you're not in a hurry, I'll tell you what I see.

What a queer leg! (don't start,) it's a table leg. No, it can't be, for it is in the middle of the room. And it is not a chair leg. I'm nearly sure it is a table leg, made of two or three sticks nailed together. Close by it is a chair without a back. No, it must be a stool, for it has only three legs. Yet it looks very much like the dilapidated remains of a superannuated chair. Ah! now, that is a better light—I can see much more distinctly. Just have patience, I'll let you look directly. There, I see him, as I'm alive, sleeping; in broad day-light too, with his mouth open. Nod, nod, nod—I thought so. He struck his head against the book case, and is awake now. He rubs his eyes lazily, looks at his book lying upon the floor, lays his head back to nod again, but recollects the book-case and stops. What a funny-looking fellow! He picks up his book—to study I suppose, and make up for lost time; he lays it upon the table, and whistles; commencing on a very high key, which, growing finer and finer—an attenuated whistle—terminates in a yawn.

There is a confused heap of black-looking things in a corner, and close by, a globe—a miniature world. Boots and the world! I presume some of those are more than "seven league boots." Ah, now, hush!—just what I want to see. He is opening his box; his treasure-box, as it seems; what wonders! Three or four piles of scribbled paper; a quantity of what is intended to be "Sketchings," "Pencillings-by-the way," "Dashes at Life," and "Moonshee Documents." He looks upon his progeny with an amiably paternal look. There is a whole port-folio of engravings, interspersed with drawings. What drawings! A cart load of withered leaves, crushed flowers, pieces of cracked glass, and bits of a little-of-every-thing-under-the-sun. What more is in that box? Ah, sir, a great deal more; but I do not intend to tell you. The mantle-piece. What a mantle-piece! Tell me what is not on it! Lamps, bottles, brushes, inkstands, tin-cups, match-safes, boxes, whet-stones—that's a commencement of the inventory for you. On the whole it looks rather dusty and dirty. I wonder how they manage to keep such clean faces, and look so trim before the public. It's a mystery. I wonder how they can be sick all day and well in the evening. It's a mystery. I wonder where they get their appetite and fastidiousness? It's a mystery. I wonder if they are really descendants of our first parents; and if so, how it happens that they differ so much from human beings in a great many respects? It's a mystery. I wonder—but we must get away from this keyhole; for I perceive, from the brushing of his coat, that he intends to walk out.

HEROD.

BY DELTA.

Upon his throne, 'mid gems and gold,
The impious Herod sat,
  In pomp of royalty
With arrogance and hauteur cold,
While crouching slaves cried, '*caveat*'
  To crowds on bended knee.

There Tyre and Sidon's legates bowed
To crave that they should still be held
  By bonds of amity:
Then, from the hushed and mighty crowd,
Long shouts of homage loud up-swelled
  Like anthems of the sea!

And hushed again, while Herod spoke,
Still swayed that countless host
  In blind servility;
Then, forth in thunder-tones loud broke
Of blasphemy and godless boast,
  "The voice of Deity!"

"The voice of God, and not of man!"
The tones the godless Monarch drank,
  Drunk with idolatry!
But lo! a with'ring silence ran
O'er that dense sea, as backward shrank,
  Its billows fearfully!

A curse! The Angel of Jehovah God!
The Mighty One, in vengeance drest
  And awful majesty,
Smote the bold wretch, who, godless, trod
Through martyr's blood, and dared to wrest
  The throne from Deity!

"The voice of God," accursed king!
Earth's fame hath made thee mad,
  To claim Divinity;
Nor, pay to Heaven, thy offering,
But, fill a throne, in crimson clad,
  And utter blasphemy!

"A God!"—The basest worm of earth,
Thou sat'st, thyself a banquet-room
  For grave-worms' revelry!
Cursing the hour that gave thee birth
Thou found'st thy rebel throne, a tomb—
  Sin's fearful destiny!

The Commencement of Pennsylvania Medical College, and Professor Gilbert's Valedictory Address to the graduates,—March, 1846.

The Introductory Addresses of the Medical Faculty of Pennsylvania College delivered at the commencement of the course of lectures just completed, having been subjected by us to a brief notice, it appears to be proper, that our critical ken should be directed to the last public performance of these gentlemen, the Valedictory, delivered by Dr. Gilbert to the class of graduates at the Commencement, held in the Hall of the Chinese Museum, March 4th, 1846.

It may be noticed, *in limine*, that the exercises of the occasion are represented, in the public prints and verbal accounts of those present, as having been conducted in a manner calculated to furnish the highest gratification to the numerous auditors, and to reflect great credit on the faculty.

The number of regular graduates was thirty-six; and two gentlemen were admitted to the honorary degree of M. D.

It is certainly encouraging to the friends of the institution to learn that a class so numerous has been sent forth, qualified, from this infant institution, to "heal the sick." We are gratified to learn that several of the theses, presented by the class, were written in the German language. We notice one on *Blasenentzündung*, another on *Das Nerven-System*, and a third on *Allgemeine Pathologie*. This pleasure arises from the hope, that the Pennsylvania Medical College is viewed with favor by the German portion of our community, as it ought to be. The parent Institution is the offspring of German parentage, it is devoted to German interests, and is bound by its charter to give instruction in the German language. This close identification of Pennsylvania Medical College with the German population of our state and country, peculiar, so far as we know, to it, and in which the Parent Institution has a pecuniary interest, so that it is actually aided in its operations in the education of Germans and their descendants, renders it proper, that this class of the community should look with especial favor on its Medical Department. For another reason we are pleased; it indicates a capacity to study German medical works, and to translate them into our own language, which may be regarded as promising the elevation and advancement of the medical learning of the United States. We hope that Pennsylvania Medical College will be considered Κατ' εξοχην the German institution, and that we shall learn, every year, of Germans having been crowned with its laurels.

We must not, however, forget the address of the Professor of Surgery, Dr. Gilbert, who was honored by his compeers with the duty of expressing the united views and feelings of the authorities to their interesting charge, as they stood before them for the last time, flushed with joy for what they had achieved, and exulting in hope extending into the bright future. To meet the expectations, formed on such occasions, is not easy. It is indeed a difficult task to present instruction steeped in feeling in such proportions as to satisfy and delight, to warn and to impress. Dr. Gilbert has, notwithstanding these difficulties, accomplished his task in such a manner as has already in various ways been acknowledged to be in a high degree commendable. He is entitled to the praise that he has received, and whatever additional plaudits may follow, will not be misplaced. His highest honor will be derived from the fidelity of the graduates to the principles he has inculcated.

The topics handled in this address, which will indicate its appropriateness and shew its value, are, 1st, a Location for future operations; 2d, Competition; 3d, Honesty; 4th, Idleness; 5th, Trials. All these are handled with great perspicuity, in an excellent spirit, with words fitly spoken, and with the inculcation of the best principles of professional and moral conduct. Various subordinate topics enrich the discourse under the heads designated. We will present one or two extracts. On the subject of study the highest ground is taken, and German literature recommended. "The world is, however, beginning to acknowledge the just claims of Germany. Being emphatically the land of books in general literature, so in Medicine, in no part of the world are all its departments cultivated with greater diligence and success. Hence it follows, that in England and in this country, a knowledge of German is beginning to be regarded as almost indispensable to thorough scholarship in Medicine. It is not easy to commune, thoroughly, with the German mind, in its profound researches, simply by translation or report. Being a primitive language, and remarkably full, rich, and expressive, it is difficult to convey its full import in another tongue. That each one may avail himself of the rich stores which are locked up in it, as in an immense magazine, he should study this language; and it will open to him the thoughts and doings of men, who have accomplished whatever is brilliant in genius, or profound in medical philosophy. We need but recite the names of Schwan, of Chelius, of Müller, of Stromeyer, of Liebeg, and of Dieffenbach, already familiar to us all; but these are only isolated rays—individual stars of that magnificent galaxy which illumes the literary hemisphere of Germany. A great amount of ignorance and error has, however, especially in this country, prevailed in re-

ference to the literary position of Germany. The debt of gratitude due to her is neither trifling nor unimportant. It is to her we are indebted for the art and foundation of all arts—the art of printing. Every department of literature and science has been adorned by her genius and talent. In mathematics, philosophy, astronomy, and theology, she boasts of powerful names, whilst in medicine, as already stated, no field of inquiry has yielded more splendid results than "*das Vaterland.*"

The moral and religious tone of the conclusion of this address is excellent. The more hortatory part is embraced under the three following heads, which speak for themselves: "1st. *In your professional and other studies, fortify yourselves against every device of scepticism.* 2d. *In your studies, and in your professional intercourse, regard man as a moral being.* 3d. *That he should recognize* RELIGION *as an all controlling principle and duty.*" Under the last division, we find the following just and beautiful sentiments—deserving of an enduring place in the heart of every young man:

"There is, in the religion of the Bible, a most perfect adaptation to the nature and capacities, and immortal longings of the human soul. It is the fountain from which streams issue to purify the moral world; bearing upon their surface those unalterable principles of right, which give life and vigor to every useful institution of man. Let your life, then, gentlemen, be devoted to its interests, and consecrated by its precepts. You will enjoy the greatest possible amount of happiness, become co-workers with those who exert a most salutary influence on the moral, social and civil interests of the world; an influence which, unseen and silent, is *now* preserving the peace of nations. Each one of you may be the centre of a thousand, for good or for evil, the whole amount of which cannot be developed this side of Eternity. Be assured that "Christian is the highest style of man." This will qualify you for the active benevolence which should characterize the good physician, make plain your duties and responsibilities, fit you for every work in society which promises to ameliorate the condition of man; and in your profession, when experience fails and judgment is at stand, you can lift up the mind to its *source*, and there obtain the needed aid. When trials are to be endured,

> "His hand the good man fastens on the skies,
> And bids earth roll, nor fears her idle whirl."

Our limits admonish us to close, and we do so with the renewed expression of our very decided approbation of the valedictory of the Professor of Surgery, both as to its form and matter, and with the sincere desire that the College may flourish much and long, and that its

sons "may go forth," as enjoined by the valedictory, "as good Samaritans, as ministering angels, blending a profound knowledge of their profession, with that cheerfulness which belongs to the consciousness of right principles and the practice of virtue. And when they approach the close of their *career*, a course of virtuous prosperity will gild the retrospect of life, whilst before them will be the cheering prospect due to well-spent time."

NATURAL HISTORY OF THE BIBLE—THE LOCUST.

The American reader is very apt to be misled by the word "locust," as that name is so generally but improperly given to a very remarkable insect of our country. The locust of the Scriptures is an entirely different species of insect. Ours is is a *hemipterous* insect, that is, the two upper wings, in the form of crustaceous cases, are membranous at their extremities, or similar to the lower ones, and they feed by means of a sucker, upon nothing but the juices of plants. It is properly called a *Cicada*, one of the most remarkable species being the *Cicada septemdecim*, or seventeen-year locust, whose periodical appearance attracts so much attention. But the true locust of the Scriptures is an *orthopterous* insect, that is, its lower wings are either folded simply lengthwise, or only in two directions, and it has mandibles and jaws for mastication. It is the *Gryllas locusta* of Linnaeus, but is now placed by Latreille (in Cuvier's Animal Kingdom, iv, 17,) under the genus *Acridium*. The wings are frequently colored very prettily, red and blue predominating. The thorax often exhibits large warts or crests of a very singular character. Its length is from two to three inches, and it has nothing of that formidable appearance ascribed to it by the Arabians, when they say that it has "the eyes of the elephant, the neck of the bull, the horns of the stag, the chest of the lion, the belly of the scorpion, the wings of the eagle, the thighs of the camel, the legs of the ostrich, and the tail of the serpent." Yet it is peculiarly fitted for the work of destruction which has rendered it so famous. "It is armed," says Kirby & S.* "with two pair of very strong jaws, the upper terminating in short, and the lower in long teeth, by which it can both lacerate and grind its food; its stomach is of extraordinary capacity and powers; its hind legs enable it to leap to a considerable distance, and its ample vans are calculated to catch the wind as sails, and so to carry it sometimes over the sea; and although a single individual can effect but little evil, yet when the entire surface of a country is covered by them, and every one makes bare the

* Entomology, I. 213.

spot on which it stands, the mischief produced may be as infinite as their numbers."

The following extracts from a communication by the Rev. Thompson, American Missionary in Syria, dated *Abeih, (Mount Lebanon,) May* 18, 1845, gives the most recent account which we have seen of the ravages of this plague, and contains some interesting facts in their natural history, which we do not recollect to have met with elsewhere, as well as a lively explanation of some passages of Scripture having reference to them. We do not think our readers will find fault with its length or with its minute details:

"In the early part of spring, clouds of locusts, passed along the sea coast, but without doing much mischief. Having deposited their eggs, they quickly disappeared. The people, however, familiar with the habits of these insects, looked with anxiety for the time when the eggs should be hatched. Nor were their apprehensions groundless. Four days after Abeih was burnt, I heard that the locusts were marching up the valley towards us, and the next morning the head of the column had reached the lower part of the village. Having collected a number of people to assist us, we went to encounter the coming desolation, with the hope of turning it aside from our village. I shall long remember the impression which the first sight of them produced. They were without wings, about the size of full-grown grasshoppers, which they very much resemble in appearance. But their countless numbers were appalling. The whole ground was black with them. On they came, like a living, creeping deluge. Nothing could arrest their progress. We kindled large fires, and burnt heaps upon heaps of them, but all in vain. Wave after wave rolled up the mountain. They poured over rocks and and stone walls and ditches and hedges, those behind forcing on those before. After a long and fruitless contest, I walked down the mountain in order to ascertain the depth of the column. But I soon grew weary of my walk through this living deluge, and seeing no end to it returned to my house. During all the succeeding day I did battle for the integrity of my own dominions. But finally, worn out with incessant skirmishing, I was obliged to surrender my rose bushes and grape vines to the enemy. Nothing was saved but the flowers which we could cover up. It was dreadful to look upon the living tide as it rolled past my house for four days. They devour every green thing, and the noise of their marching and foraging resembles that of rain on a distant forest.

In every stage of their existence the locusts furnish a most impressive exhibition of the power of God to punish a wicked world. Look at the pioneers of the host, those flying squadrons that appear in spring.

Behold this furious impulse for the propagation of their devouring progeny. No power on earth can interrupt it. Millions upon millions, with most fatal industry, deposit their innumerable eggs in every field, plain, forest and desert. This done they vanish like the morning mist. But in six or seven weeks, the very dust seems to waken into life, and, moulded into maggots, begin to creep. Soon this animated dust is transformed into minute grasshoppers, which, by some strange instinct, all creep and hop in the same direction, devouring every thing in the line of march. After a few days, this voracious appetite palls; they become sluggish, and fast, like the silk worms. Like the silk worms, they are said to repeat these fasts four times before they have passed through all their transmutations, and are accommodated with wings. I do not remember to have seen this circumstance mentioned by any naturalist.

The references to the habits and characteristics of the locusts in the Bible, are numerous and accurate. The prophet Joel says, 'He hath laid my vine waste, and barked my fig tree; he hath made it clean bare, and cast it away; the branches thereof are made white.' These locusts stripped the vines, in a few hours, of every leaf and cluster of grapes, and of every green thing. Large fig orchards were 'made clean bare.' Not a leaf remained, and, as the bark of the fig tree is of a silvery whiteness, the whole orchards thus rifled of their green robes, spread abroad their branches 'made white,' in melancholy nakedness, to the burning sun. Contemplating the utter desolation which they effect, the prophet exclaims, 'Alas for the day! For the day of the Lord is at hand, and as a destruction from the Almighty shall it come. Is not the meat cut off before our eyes?' This is emphatically true. I saw a large vineyard, loaded with the promise of an abundant vintage, stripped bare in a very short time, literally 'cut off before our eyes.' Again, 'How do the beasts groan! The herds of cattle are perplexed because they have no pasture; yea the flocks of sheep are made desolate.' This is not more poetical than just. A field, over which this flood of desolation has swept, shows not a blade for even a goat to nip. 'The land is as the garden of Eden before them, and behind them a desolate wilderness; yea, and nothing shall escape them.' Every green thing vanishes as if by magic; nor is any weed too bitter for their omnivorous appetite. 'They shall run like mighty men; they shall climb the wall like men of war; and they shall march every one on his ways, and they shall not break their ranks.' When the front 'ranks' of this mighty host reached the lofty palace of the Emir Asaad, they did not break their ranks, nor wheel round the corners, but climbed the wall like men of war, and marched over the top of it. And so also a living

stream poured over the roof of Doct. Van Dyck's house, notwithstanding his efforts to make them 'break their ranks,' and turn aside from his premises. 'They shall run to and fro in the city; they shall run upon the wall; they shall climb up upon the houses; they shall enter in at the windows like a thief.' They appear to have a partiality for the walls of houses, and often cover them with their countless numbers until they are quite black. Nor were flowers, carried into the rooms in pots safe; for 'they entered in at the windows like a thief.'

The prophet Nahum says, that the locusts 'camp in the hedges in the cold day; but when the sun ariseth they flee away, and their place is not known where they are.' They did not again commence their march until the sun, on the succeeding morning, became hot. The rapidity with which they 'flee away' is always in proportion to the heat of the day. 'Their place is not known where they are.' "

COLLEGE RECORD.

The Annual Contest between the Literary Societies of Pennsylvania College took place, in Christ's Church, on Wednesday evening, the 15th ult. The following is the order of exercises:

PRAYER—By REV. J. FEW SMITH.

ESSAYS—"*Pompeii*," J. WILSON PAXTON, Gettysburg, Pa. "*The Design of Creation*," G. J. MARTZ, Frederick Co., Md.

ORATIONS—"*The Desire of Reputation*," A. ESSICK, Franklin Co., Pa. "*The Unknown God*," W. A. RENSHAW, Littlestown, Pa.

DEBATE—"*Do the Signs of the Times indicate a Dissolution of the Union?*" Affirmative, J. M. CLEMENT, Mocksville, N. C. Negative, C. A. BROUGHER, Tippah Co., Miss.

BENEDICTION—By Pres. C. P. KRAUTH, D. D.

We have heard but one opinion expressed in reference to the exercises, and it was that of strong commendation. The productions were of a highly interesting character, well written and reflected great credit upon the young gentlemen representing the Societies on the occasion. The purity of sentiment, excellence of thought, elegance of diction, and correctness of delivery, made a very favorable impression upon the large and attentive audience, who evinced undiminished interest until the close, although the exercises were protracted beyond the space of three hours. We must not forget to state that *The Haydn Association* enlivened the intervals of the exercises with sweet and well-selected music, performed in their usually admirable manner, and that this contributed in no small degree to give additional interest to the exercises.

MISCELLANEOUS ITEMS.

Remedy for Arsenical preparations. For several years already, it has been known that Iron, in its state of hydrated peroxide as obtained by precipitating the persulphate by a solution of ammonia, is a valuable antidote to poisoning by arsenic. It has been recently ascertained that, in those cases in which its ordinary use has had no efficacy, success is insured by adding acetic acid, so that the peroxide however may remain in excess. This preparation largely administered, diluted with water, is much more certain in its results than the simple peroxide.

Newly discovered Metals.—The list of metals has within the last few years been greatly enlarged by the discoveries of chemists. Within a little more than a year just past three new ones have been discovered, viz: Pelopium, Niobium, and Ruthenium. The list now contains 48.

Prof. Faraday announces the fact, that the polarization of light can be essentially modified and controlled by means of the galvanic current. Hence he infers, (or we should say conjectures) that the magnetic currents of the earth are evolved from air and water by means of the action of light.—S. W. M.

A Pennsylvanian has invented a new method of propelling steamboats by which it is claimed a speed of twenty-five to thirty miles an hour may be obtained even in the ocean. Models are now before a committee of the U. S. Senate, and arrangements are making to carry it into operation. The invention entirely supercedes paddle wheels, screw propellers, &c., and operates under water out of reach of an enemy's fire.—S. W. M.

An important improvement on the Belier Hydraulicque or Hydraulic Ram has been made by Benjamin S. Benson, of Jerusalem Mills, Harford Co., Md., by which the power of the machine can be applied to raising water from a different stream from the one which furnishes the power. Heretofore the water raised by these machines was always a part of the stream which set them in motion, and of course partook of all its impurities.—S. W. M.

The U. S. Topographical Engineers are engaged in surveying the coast of Texas. It is thought that an inland navigation, by means of the numerous sounds and bayous existing along the coast, may be constructed for steam boats at a small expense, the entire distance from the Mississippi to the Rio Grande.—S. W. M.

Mr. Samarre Picquot, a French Naturalist, arrived at Detroit a few weeks since from a protracted scientific excursion round Lake Huron. He has collected over three hundred different kinds of marine plants, many of which are new.—S. W. M.

Pennsylvania College, Gettysburg, Pa.

PENNSYLVANIA COLLEGE has now been chartered about fourteen years. During this time its progress has been such as to gratify the most sanguine expectations of its friends. The course of studies is as extensive and substantial as that of any Institution in the Country. The *Preparatory Department* provides for instruction in all the branches of a thorough English, business education, in addition to the elements of the Mathematics and Classical Literature. The *College Course* is arranged in the four classes usual in the Institutions of this country.

The government of the students is as energetic as their circumstances seem to require. They attend at least two recitations a day, Church and Bible Class on the Sabbath, and are visited in their rooms so frequently as to preclude the danger of any great irregularities. It is believed no Institution in the United States has more exemplary young men in connexion with it. They are all required to lodge in the College Edifice, special cases excepted.

The annual expenses are—for board, tuition and room-rent, during the winter session, $61 87½: for the summer session, $41 87½. Washing, $10 00: and Wood, $3 00. Total expense, $116 75. Boarding can be obtained in town at $1 25 per week.

There are two vacations in the year, commencing on the third Thursdays of April and September, each of five weeks continuance.

Acknowledgements of Donations to the Cabinet of the Linnæan Association of Pennsylvania College.

April, 1846. From *J. Harrison Kelly*, a Revolutionary sword.
2. From *H. M. Bickel*, 14 specimens of minerals.
3. From Rev. *W. H. Harrison*, a specimen of lead ore.
4. *A. J. Huntzinger*, Continental money.

Receipts during April.

Rev. D. F. Bittle, Middletown, Md.	in full.
" W. Passavant, Pittsburg,	"
" J. Karn, Canton, Ohio,	"
" Prof. H. I. Smith, Hartwick, N. Y.	" Vol. 1st & 2d.
" Wm. Kopp, Loudon, Pa.	"
H. W. Thorp, Elkton, Md.	"
Jno. T. Morris, Baltimore, Md.	"
H. R. Geiger, Gettysburg,	"
Isaac Sprecher, "	"

TERMS OF THE RECORD AND JOURNAL. *One Dollar per annum in advance.*

Address—"*Editors of the Record and Journal, Gettysburg, Pa.*"

VOLUME II.] [NUMBER 8.

THE

LITERARY RECORD AND JOURNAL

Of the Linnaean Association of Pennsylvania College.

JUNE, 1846.

CONDUCTED

By a Committee of the Association.

CONTENTS.

1½ sheet, periodical—Postage, 2½ cents, to any distance within the Union.

NEINSTEDT, PRINTER, GETTYSBURG.

THE LITERARY

RECORD AND JOURNAL

OF THE LINNÆAN ASSOCIATION OF PENNSYLVANIA COLLEGE.

Vol. II. JUNE, 1846. No. 8.

GEOLOGY. NO. IV.

Igneous action.

The inquisitive explorer, who every where encounters numerous evidences that changes of the most decided character and on an extensive scale have taken place in the structure of the Earth, very naturally enquires what are the probable causes which have been instrumental in their production. His observation and past experience, together with the character of the results under consideration, readily suggest to him that two causes have been principally at work, viz. the agency of *fire* and *water*. The latter degrades hills, mountains, and continents, transports the washed materials to other localities, and thus becomes the originating cause of all stratified rocks. The former acts in a contrary direction; elevating hills, mountains, and continents, and diversifying the earth with dry land and ocean, with mountains and plains, and with hills and valleys. As the elevating and disrupting must act anterior to the degrading and levelling force, igneous action first claims our attention.

6. In our inquiries upon this point, our attention is at once arrested by the large number and the extensive distribution of volcanos, which are evidently the channels of communication between large masses of subterranean igneous matter and the upper world.

Their number. Arago enumerates *one hundred and sixty-three* active vents as occurring in various parts of the known world. These, regularly or at intervals, send forth into the atmosphere *smoke*, *vapor*, *flame*, *large stones*, *sand*, *scoriae*, and a melted mass, *or melted rock* called *lava*. Some throw out mud and boiling water. Some are in a constant state of eruption, as Stromboli, Nicaragua, and a few others; some manifest a state of activity at intervals of a few years, and others only after the lapse of fifty to one hundred and two hundred years, as Etna and Teneriffe. Besides these one hundred and sixty-three, there are some which

have never, within the memory of man, been in an active state, or at least we have no record of their eruptions, if any have occurred; but as they have craters like the active, are surrounded by lava which has flowed from them, and other products, which have been ejected, and yet emit vapors and gases, we cannot be mistaken as to their former character. Such are called dormant volcanos; the probability being that they never will again assume a state of activity, but yet the probability remaining that they may hereafter become a terror to those persons, who have dared to erect their dwellings upon their sides, and even in their very craters. Such had been the case with Monte Somna, Italy. The cities of Herculaneum and Pompeii had been built on its flanks, their streets paved, and the walls of their edifices raised with the old lava, and the inhabitants secure and given up to luxury and pleasure, and fearing no evil, when unexpectedly, in A. D. 79, Vesuvius, a new crater within the old Somna, was formed, from which the lava ingulphed the nearer Pompeii, and the ashes and scoriae overwhelmed the farther Herculaneum.

Distribution. These one hundred and sixty-three active vents, the many which are dormant, and the yet imperfectly known submarine volcanos, are distributed without much partiality over the earth's surface. We find them under the Equator, in the temperate and in the frigid zones, on the Eastern and Western Continents, and in every ocean. They seem, however, nearly all to have some regularity of connection with each other. The great chain of American mountains, from Terra del Fuego, at the southern point of America, throughout its whole length to the promontory of Analaska, seems to conceal a continuous stratum of fire, which, here and there at the separate volcanic vents, sends forth into the atmosphere a portion of its burning mass. From Analaska this chain passes off into the Pacific ocean through the Aelutian or Fox Islands, thence into Kamtskatka, and, through the mountains of Siberia and Tartary, into those of Asia Minor, Syria, and Arabia, thus forming one vast arch of fire. From one leg of this arch, in the northern parts of South America, there passes off a branch to the North and North-east, through the West India islands, towards the Azores on the West of Spain.—From the Eastern leg there pass off two branches, the one from Southern Asia, through Sumatra, Java, and the islands of Australia and Polenesia,; the other from Western Asia through the islands of the Mediterranean, and the mountains of Italy, &c., into the Atlantic at the Cape de Verd, Canary Isles, and the Azores, thus forming a direct connection between the great American and Asiatic chains. Besides these, we might notice the vents of Iceland, of the Sandwich Islands, and many others, which pour forth their fires from amidst the waters of the several oceans.

From such a view of the subject we are struck with surprise, that so large a portion of the earth's surface is resting upon subterranean fires. It is not a hyperbole to say, that these connected chains constitute but one vast volcano, communicating with the surface and the air, by its more than one hundred vents or craters.

A second fact, which demands our attention, is the intimate connection which subsists between volcanic action and earthquakes. *The geographical relation* of earthquakes immediately raises a presumption of their necessary dependence upon volcanic action. So readily does this conviction arise, that the ancient Greeks and other nations of antiquity referred them to the same cause. They take place most frequently in volcanic districts. The northern portions of South America and some portions of the districts near the Andes, especially the province of Quito, which has often been represented as resting on one vast volcano, are almost constantly more or less shaken with earthquakes. The same is true with reference to the countries in Southern Italy and the adjacent islands. *Their intimate connexion is farther shown by the remarkable fact*, that when the volcanic vents are open, and belching forth vapor, fire, and lava, the earthquakes are less violent, than when the volcanos seem to be inactive. "At Naples and at Messina, at the foot of Cotopaxi and the Tunguragua, earthquakes are dreaded only when vapors and flames do not issue from the mouth of the volcano. In the kingdom of Quito, the catastrophe of Riobamba led many of the well informed inhabitants to believe that this unfortunate country would be less often disturbed, if the subterranean fire would succeed in destroying the dome of porphyry of Chimborazo, which prevents eruptions from its top, and if this colossal mountain should become an active volcano." The reason of these facts seems to be plain; for when the volcanic forces are repressed and confined, it is reasonable that they should keep the superincumbent crust in a state of violent agitation, and frequently seek egress for themselves, by uplifting and breaking the rocky strata above, but when there is free egress for them through the volcanic vents, they should less disturb the country around. An other fact worthy of remark, and explicable upon the same principles, is that the earth's surface is generally more violently disturbed at some distance from the volcanic vents than at places which are near. Sometimes immediately before the earthquake the volcano ceases its activity. On the morning of November 1st, 1755, on which day the terrible earthquake which destroyed Lisbon and shook one-fourth of the whole northern hemisphere took place, Vesuvius was in a state of excitement, but it became suddenly quiet at the very hour of the shock; and Van Hoff relates that the column

of steam, which previously arose, returned into the crater. The same happened during the earthquake of Calabria, 1638. Stromboli, which is continually active, subsided and almost ceased smoking. Other facts of a similar character might be adduced, but these will sufficiently illustrate our point. But facts of this kind, and others which will be presently adduced, suggested to Seneca the true nature of volcanos, for he says concerning them, "*in ipsa monte non alimentum habent, sed viam.*" We are also no less surprised at the simultaneous occurrence of earthquakes at places immensely distant from each other. Thus the fatal earthquake of 1775, which destroyed Lisbon, was felt over nearly all Europe, the northern coast of Africa, and the West India Islands, or over one-quarter of the Northern hemisphere. On the 16th November, 1827, simultaneous shocks were felt at Ochotsk in Eastern Siberia, and at Bogota in South America, nineteen hundred geographical miles distant. On the coast of the southern Pacific their action is almost instantaneously communicated from Chili to the gulf of Guayaquil, a distance of six hundred miles. In 1812 when Caraccas, South America, was destroyed, and the country terribly convulsed, the country along the west bank of the Mississippi was rent, several small villages were nearly destroyed and the shocks felt along the upper lakes. Not unfrequently have eruptions in the mountains of Mexico and the West Indies been accompanied by shocks in the valley of the Mississippi, along the lakes, and the St. Lawrence. Not longer than about five years ago, during a violent earthquake in the island of Martinique, some of the springs in the valley of the Mississippi were rendered turbid. Thus, when we take into consideration the extensive distribution and communication of volcanos with each other, the intimate connexion which exists between volcanos and earthquakes; and the magnitude of the districts in which the latter are felt almost simultaneously, even where no volcanos exist, we advance one step farther towards the conclusion, that the surface of the earth is every where resting on subterranean fires.

ON THE NATURAL ORDER OF THE ARTICULATE SOUNDS OF THE HUMAN VOICE.

BY PROF. S. S. HALDEMAN, A. M. OF COLUMBIA, PA.

The order and relations of the letters in a philosophicl alphabet is a very nice problem, the solution of which will afford considerabl aid in the study of philology; throwing light upon the variations which words undergo with respect to an interchange or replacement of letters.

The alphabet may properly commence with the vawels, the order of

which, as determined mechanically, is, using the Italian, German (or only proper) power I, E, A, O, U, for what may be called the faiv *primary* vawels. Between these, however, there are certain secondary vawels which raise the number to twelv, exclusiv of the Arabic glottals, which vawels may be marked with ˵ beneath; and nasals, which may have ˷ beneath. The twelv vawels are

VOICE

- uninterrupted, . . . Vowels, . . . 1 ɩ marine, 2 ˥ fit, 3 E were, 4 Ɛ net, 5 ʎ fan, 6 A art, 7 ∩ nor, 8 O lo, 9 O fur, 10 U rule, 11 Y (9″ ∀) u Fr. œ Germ.
  - Natural, as in . . . . . .
  - Assonant in man. ˷
  - Glottal in ain. ˵
- Consonants, ... *labial, dental, palatal, guttural, glottal.*
- interrupted
  - partly, LIQUIDS, ...
    - lenc. 12 Wi 19 Li 26 Ri, rri 33 Ji (yi) 40 Hi
    - aspr. 13 Whi 20 Lhi 27 Rhi 34 Jhi 41 Hhi.
  - fully, MUTES,
    - assonant . . .
      - lenc. 14 Mi 21 Ni 28 35 Ngi 42′
      - aspr. 14″ Mhi 21″ Nhi 28″ 35″ 42″
    - natural
      - grave
        - lenc. 15 Bi 22 Di 29 Zi 36 Gi 43 G˵i.
        - aspr. 16 Vi 23 Dhi 30 Zhi 37 Ghi 44 G˵hi.
      - acute
        - lenc. 17 Pi 24 Ti 31 Si 38 Ki 45 K˵i.
        - aspr. 18 Fi 25 Thi 32 Shi 39 Khi 46 K˵hi.

Ending the vawel series with those which may be called labial, the natural passage to the consonants is thru Wi* which thus becomes the first of the labial consonants, whilst its affinity with U (oo) is so great that many consider them identical.†

In pronauncing the syllabl *hap* the breth is cut off abruptly, but if we force it past the labial barrier, the final consonant unites with *hi* or a portion of breth, when the syllabl becomes *haf*. *Fi* is therefore an *aspirate*, and *pi* a *lene*, whilst both are whisperd, *surd*, or *acute*. *Bi* and *vi* are not acute, they are *grave* or *sonant*. From the whisperd character of *pi*, *si*, *ki*, and their aspirates, they are calld *mutes*, a term which may be extended to include the sonants *bi*, *vi*, &c. excepting the liquids and nasals.

The liquid of the *pi* series, Wi, being grave or sonant, is heard; it is moreover not aspirated, it is *lene*. If we aspirate it, it becomes acute or whisperd (Whi) as in *when*. Both ar capable of being nasalised. The principl nasal of the series is hawever Mi, which is only a nasalised or "resonant" *bi*.

There ar two kinds of labial mutes, as *bi*. *pi*, and the labio-dental as *fi*, *vi*. The German (16′) ꝑi is a tru labial *vi*, as well as *fi* when it follows *pi*. The labio-dental *vi* may be numbered 16″.

From the lips we proceed to the tung and teeth which form the dentals or lingui-dentals, the liquid sonant of which is (19) Li, and (20) Lhi when aspirate, surd, or acute. The nasal of the dental series is (21) Ni, which is nasal (22) Di, being, like it, sonant. It may be remarkt that the nasals are subject to an acute aspiration which is not introduced into the table, to leav it as simple as possibl. I have noticed that of (21″) Nhi in Cherokee. The aspirate of *di* is (23) Dhi in *these*, after which follow (24) Ti, and (25) Thi in *thin*.

If we remove the tung from the teeth and place it a little farther back, we get the Si series, of which the liquid is (26) Ri English, and (26″) ri vi-brant, the former an acute aspirate in (27) *rhi*. The nasal palatal (28) I have not been able to discover in any language I have heard. The grave and acute lene *zi*, *si*, of the palatal series differ from the other mutes in being continuous, and not abrupt.

* I place the first vawel after every consonant for the sake of juniformity when a name is required. The vawel must follow, because some nations cannot pronaunce a final consonant, as in *ef*, *em*.

† Dr. Webster says that *well* is merely *oo-oo* or *u-u*. This false view induces some to write "such *an* one" insted of "such a one"—*a* wonder. So I and *yi* are confaunded by those who say *an* insted of *a* unit, altho they do not say *an* yoke. The initials of *year* and yunit (more correctly junit) are identicl.

Posterior to the palatals, the post-palatals, usually called gutturals are formed. They do not come from the throat, altho they ar the most posterior of the usual Europèan consonants. The guttural liquid is (33) *yi* whose aspirate (34) *yhi* I believe I have detected in Cherokee. The nasal of (36) *gi*, is (35) *ngi* (ʒ) in *sing*, *ring*,* which has no connexion with *ni* as usually supposed. The aspirate of *gi* is (37) *ghi* in the German word regen, and of (38) *ki*, (39) *khi* in ich, (Spanish J) which makes a near approach to the English and German (40) *hi*, which I have doubtingly placed as a liquid of the glottal series. It has a vibrant aspirate (41) which can be readily formd, and may be the proper power of the Hebrew *hhaith*.

The Tshiauk Indians of the Columbia river, have a K formed farther back than the ordinary *ki*, which always precedes its proper aspirate, and is represented by *qq* or *qh* by the Spaniards; the same sound being, as I believe, found in Mekhiko. I am unable to tell in what respect this differs from the Arabic K or *qof*, never having enjoyed an opportunity of studying the latter. Q of appears to be more posterior than qqi, and the mouth less contracted, whilst the tip of the tung does not rest upon the palate near the teeth. The latter peculiarity virtually places *ti* before the letter, and perhaps a slight *lhi* after it. Mr. Hale of the United States Exploring Expedition appears to have confounded it with no. 39, at least in its essential peculiarity. I am inclined to think that the Arabic vibrant (44) *ghain*, which corresponds to no. 37, is the grave correspondnt to the Tshiauk (46) with the addition of the vibration. The glottal series, being as distinct from the guttural as these ar from the dentals, they require distinct characters, altho I am of opinion that each of the faiv verticl columns should be represented by a single character, the distinctions being made by appropriate points. Thus if B, (the curves of which may indicate the lips) be a proper representativ of the sound *bi*, its nasal *mi* would be well represented by B.

The last modification of the vois to which I will call attention, is the close of the glottis as in coughing, and is of cours the termination of the seris. It is heard in a vulgar German equivalent for *no*, which may be written n o ʔ o, each of the three letters being nasalised. The corresponding English word is pronaunst n o ʔ h. It is an essential element of human speech, and the Wyandot language cannot be written with out it.

* Dr. Patterson of the Am. Phil. Soc. informs me that in Herr Faber's speaking machine *ngi* is formed by touching the *gui* and the nasal key at the same time. This machine requires but sixteen keys several of which can be touched at once, A and O for example, producing ɑ.

INTERESTING ANT-SCENE.

Mr. Editor:—Since the appearance of several articles in your excellent Journal on the subject of ants, my attention has been directed to them. I have a distinct recollection of a scene that occurred on the step of my porch during the warm weather of last Summer. Seated in the shade during the evening of a sultry day, I saw many ants passing to and fro with the characteristic alacrity of that insect, frequently stopping a moment and touching each other with their feelers, apparently saluting each other, and then passing on with hurried steps to complete the work of a day. Among the crowd that were moving along, I noticed two large black ants that did not participate in the activity and friendly feeling of those around them. They were in close proximity with each other, and, when first seen, were motionless. On close examination I discovered that they were engaged in deadly combat, and that they had seized each other with their powerful mandibles, and were not disposed to relinquish their grasp. Presently they renewed the contest, and began to pull each other furiously. One of the gentlemen, I discovered, had already lost a leg in the warfare, but manifested no disposition to abandon the contest. I wondered how they two, and no more, happened to come together in this place, and, away from their friends and acquaintances, engage in such a fearful battle; for they were of a different species from the small ants which were passing near them, and seemed to be ignorant of their existence. Did they belong to the same family or different families? Had high words passed between them in a debating club, or in a congress of the tribe, and had they come here on the step of my porch as a neutral ground to settle their difficulties? I knew it could not be a love affair, for the ants have never been known to pull off each others legs, or blow out each others brains under such influences. These chaps belonged to the class called *neuters*, and therefore cared nothing at all about the ladies. I knew that the ants, in large numbers, marshalled in battle array, attacked and robbed their neighbors of their larvæ, and reared them as members of their own tribe and employed them as workers. But here is a single combat, between two gentlemen, without seconds or attendants of any kind, in a retired place, behind the corner of my porch, in the shade, in the after-part of the day. It was to me quite inexplicable. Whilst these thoughts were passing through my mind another ant of the same species passed along on the step; whether he was in pursuit of the two combatants, or what he was after, I could never discover. He paused when he came near them, touched one of them with his feelers, and then jumped back with

a short convulsive jump, as if he had come into contact with something very offensive. He then touched the other combatant, and a similar movement followed. The effect of these touches upon the belligerent parties was to inflame their anger, and to stimulate them to more fearful deeds of violence. I supposed, from the movements of the third party, that all his efforts were directed to the pacification of the warriors, and I have had no reason unto this day to change my opinion. He seemed to be startled and alarmed at the spirit of his brethren, and when his well-meant efforts resulted in nothing but an aggravation of the evil he sought to remedy, he stood for some moments in silent astonishment, apparently grieved at heart, then, as a final appeal to all the nobler sensibilities of the ant-nature, he raised himself up on his hind legs and stretching out his feelers and his fore-legs (or arms) seemed to say with tears in his eyes, "Alas! brethren you ought not to do so; you are destroying yourselves, and you are violating the laws which bind us together in the social compact. I pray you make an amicable adjustment of your difficulties, and suffer not your example to exert a deleterious influence upon mankind, who by the Great Creator have been directed to us in order that they may learn lessons of wisdom." What the effect of this speech was I did not stop to ascertain, as the bell at that moment summoned the family to the evening meal and I was compelled to leave.

LETTERS TO A FRIEND AT COLLEGE. NO. II.

DEAR AMICUS:

You assure me that you are "anxious for the '*second lesson*,' and hope it will not be delayed so long, that you will have forgotten the first before it arrives." Well, although collegians are so fond of quizzing, I take you at your word, and, according to the three rules for Epics, dash at once "*in medias res.*"

I am to examine "*What is your situation*" as a student in College? Of course, in accordance with what I have already said, my question refers to the advantages which you enjoy for study.

Ah! I see in your snug little room, surrounded with books and associated with a friend who is now to you what you once were to me, a spur to urge me forward in my literary pursuits by your generous emulation. You would like to talk over all sorts of subjects, but it is within an hour of "recitation," and he must busily thrum his Dictionary, and you must read over your notes and consult the authors to whom the Professor in his last lecture, upon which you are forthwith to be examined, referred you for further elucidations of his subject. I see

you bend in deep absorption over some knotty passage of the "Analogy," when, all at once, you are startled by the cry, "Come! it is time to go," and off you hurry to the "Recitation-room." You are examined upon some of the mysteries of that plan of the divine government, the whole scheme of which angels find themselves too weak in judgment fully to comprehend; but the least of whose laws is a link that unites earth and heaven. You hesitate to express the crude conceptions that you had formed. Your experienced Professor sees your perplexity. An adept in the Socratic art he asks another question which presents the subject in a light entirely new. You now see the force of what he had said in his last lecture, penetrate into the very spirit of BUTLER, and feel that you now have in your hands a clue to guide you through all the mazes of this labyrinth. You give your answer, though but in two words, and these shall henceforth and forever be your "open sesame" into what you had but an hour before regarded as a gloomy region into which you could never find your way, or as one where you must forever wander about in uncertainty, even if you should succeed in crossing its threshold. Thus, one point after another is elucidated, and you return to your room with fresh courage for the prosecution of at least this department of your studies.

In the same way are the principles of every science, the treasures of Grecian and of Roman literature, (where the most insignificant circumstance now lies, like the ant of MARTIAL,* immortalized in amber,) and the Gothic richness of modern languages unfolded to you. But if all this is not sufficient, if you wish for additional light or for a greater variety of studies, there are the ten thousand volumes of the various libraries of the Institution opening to you their exhaustless stores. And again lest you should dissipate your mind by wavering from one volume and from one subject to another, as the bee is said to have gathered no honey in the island of Java where innumerable flowers were ever blooming around it, there is the fixed amount of study, the prescribed Academical course over which you must go, if you will be dismissed from College crowned with its "first laurel."

Or do you tire of studying in silence? Whilst you are gathering ideas and culling the choicest words in which to clothe them, do you feel the impulse grow strong within you to give them utterance? There is your friend and room-mate to whom you can talk "*De omnibus rebus*

* *Dum Phaethonteâ formica vogatur in umbrâ,*
Implicuit tenuem succina gutta feram:
Sic modo quae fuerat vitâ contemta manente,
Funeribus facta est nunc pretiosa suis.—Mart. Epig. Lib. vi. 15.

et quibusdam aliis." There are your classmates A. and Z. who are engaged in the same investigations as those of which you used to be so fond, the one all imagination, the other "pure reason," between whom you are the proper connecting link—the conductor to draw thunder and lightning out of this positive and negative electricity. There are your "Essays" to be read before the Professor of Rhetoric, which you can fill with any of your speculations, and make redolent of all your reading and meditations. There is your "Literary Society," that true arena of American College-life, where our future statesmen and demagogues, lawyers and clergymen first essay their arms and learn the tactics of the approaching campaign.

These are a few of your facilities for study which make up the routine of your every-day life, and if they do not impel and hurry you along with still accelerating velocity in your appropriate course, that is to say, in the acquisition of knowledge and the mastering of principles, then you must either be hopelessly stupid, or deep sunk in the mire of indolence. The former supposition we will not for a moment entertain. Stupidity and study are the antipodes of each other, and I can scarcely conceive it possible for a dolt to gain admittance into the temple sacred to Apollo and the Muses, whose arrows would soon transfix or their jeers expel so daring an intruder.

But well did our Archon, when admitting us into our Literary Society say "Beware of *Indolence!*" Indolence among students takes various forms. The most common is that of *novel-reading*. This is natural. The student cannot conceal the fact that his business is with books, and therefore he imagines that the reading of this trash gives him at least the *appearance* of study. Novels are to the mind what ardent spirits are to the body. They first stimulate into an unnatural activity some of the faculties, particularly the imagination and passions, and then leave it prostrated and unfit for ordinary duty, with a constant longing after the dangerous drug. But not only do these books unfit you for the proper exercise of your mind, but they likewise disgust you with your present condition and employments whatever they may be, and unfit you for all the realities of after-life. The novelist, who possesses any genius, converts you at once into another man, and transfers you to another world entirely different from that in which you are habitually to live. No wonder, then, that the habitual novel-reader is disgusted with his studies and the slave of indolence.

But a no less certain forerunner and accompaniment of indolence is *the visiting of female society*, during term-time. We may apply to the student what Horace says of the athlete:

Qui studet optatam cursu contingere metam
Abstinuit venere.

The student's profession is to be his mistress, and it is as true here as in anything else, than "*no man can serve two masters.*" The reasons are obvious. The society of ladies introduces an entirely different set of ideas into the mind—utterly inconsistent with our studies. Who would be so rude as in the elegant society of *young* ladies to talk about those *old* heathens the Greeks and Romans? It would be the most ridiculous pedantry. And if you do not go into society generally, but devote yourself to one *particularly*, the case is still worse. You are the miserable victim of passion. Your days are devoted to preparation for your evening meeting, and your nights to dreams and visions of your beautiful Dulcinea. Poor wretch! how is it possible for you to study? How can you concentrate your thoughts upon the abstractions of science? Hoping that this is not your sad case, I remain, as ever, yours truly,

PHILO.

WYTTENBACH.

Holland has ever been distinguished for her learned men. Her intellectual history is exceedingly rich and interesting. No where do we find names more conspicuous in Letters and Philosophy. In classical philology Germany alone can claim a higher rank. Her scholars have accumulated treasures of most valuable materials, and by their extensive acquisitions have secured the praise of all Europe. And a country that can boast of such illustrious names as Erasmus, Dousa, Scaliger, Lipsius, Heinsius, Gronovius, Perizonius, Valckenaer, Hemsterhuys, Ruhnken, and Wyttenbach, is justly entitled to a prominent position among all nations. They would shed lustre upon any land.

But of all these philologists there is none whose character and success in study we so delight to comtemplate as *Wyttenbach.* The influence which he exerted, the sway which he exercised over the realm of letters, and the reputation which his works have won, will, doubtless, justify a brief sketch of him in the *Record.* And would! that those who are engaged in classical studies, at the present day, possessed the same irrepressible enthusiasm, *always the harbinger of success*, the same ardent love in their prosecution, the same patient industry and inflexible perseverance which he evinced; then, indeed, might we look for profound scholars and thinkers, instead of sciolists; then would the student reap all the advantages from the classics which their study is designed to impart.

"Wyttenbach," says one of his biographers, "seems to have been born for the study of antiquity. He was so imbued with classical learning from a child, that all which he said, all which he wrote, and all which he thought had an ancient coloring about it, and seemed to have sprung from antiquity itself. He spoke Latin in his public lectures as one does his native language; indeed as few are able to use it. For his diction flowed pure, limpid, harmonious, luminous, wholly free from the defilement of a later age; it gushed out, as it were, spontaneously, so that he seemed not to have premeditated either what he should say or how he should say it." His elementary education he received under the direction of his father, and even in boyhood he showed all that enthusiasm which is so essential to success in study. On one occasion, having accidentally met with *Xenophon's Memorabilia* for the first time, he thus speaks of the emotions of pleasure which its perusal excited: "I was captivated with the indescribable sweetness of the author. The grounds of it I had better understood afterwards. In studying this treatise, I made it a point never to begin a section without re-perusing the preceding; nor a chapter or book, without studying the preceding chapter and book a second time. Having, at length, completed the work in this manner, I again read the whole in course. It occupied me almost three months; but such unceasing repetition was most serviceable to me." He then read all the works of Xenophon four times in four months.

We refer to the plan he adopted and the success which crowned his efforts in studying the classics, supposing it may be interesting to others engaged in similar pursuits. He read the Greek authors in chronological order, commencing with the *Iliad* of Homer. This he finished in two months, revising it in the same manner as he had the *Memorabilia.* At first, the reading of Homer was more irksome than pleasant; it was only by repeated readings that he was enabled to appreciate the merits of the author, or recognize the divine genius of the poet. He now imagined that he could read any author with equal facility. He took up *Demosthenes;* but here all was darkness—he was perplexed on all sides. He, however, had determined not to shrink from any difficulties, to be deterred by any discouragements. He writes: "I went on. I found greater difficulties than I had ever had before, both in the words and in the length of the sentences. At last with much ado, I reached the end of the first *Olynthiac*, and then read it a second and a third time. Every thing now appeared plain and clear. Still I did not perceive the fire of eloquence for which he is distinguished. I hesitated whether to proceed to the second oration, or again read the first. I resolved to do the

latter. *How salutary are the effects of such a review!* As I read, an altogether new and unknown feeling took possession of me. In perusing other authors, my pleasure had arisen from a perception of the thoughts and words, or from a consciousness of my own progress. Now an extraordinary feeling pervaded my mind and increased with every fresh perusal. I saw the orator on fire, in anguish impetuously borne forward. I was inflamed also and carried on upon the same tide. I was conscious of a new elevation of soul, and was no longer the same individual. I seemed myself to be Demosthenes, standing on the *bema*, pouring forth the oration and urging the Athenians to emulate the bravery and glory of their ancestors. Neither did I read silently, as I had begun, but with a loud voice, to which I was secretly impelled by the force and fervor of the sentiments, as well as by the power of oratorical rhythm. In this manner, I read in the course of three months, most of Demosthenes' orations. My ability to understand an author being thus increased, I took more delight in Homer, and studied other authors with greater profit."

He next took up *Plato*, not only reading the dialogues but writing annotations upon them, an exercise which has proved most profitable to every student who has tried it. In an address to his pupils, he thus refers to this period: "Then I began to know that the study of Plato is not only useful in itself, through the influence which it exerts on the manners, the intellect, the moral character, the style of writing; also by its promoting an elegant delivery, and a thorough acquaintance with Greek literature and philosophy; but that it is far more useful, from the fact that it enables all scholars who have lived subsequently to understand the Greek and Roman authors correctly, the effects of the study of Plato being diffused through them all, and even through the whole circle of ancient knowledge."

He then directed his attention to Julian, Plutarch, and other philosophers and rhetoricians of that age. But we must hasten on with our narrative. In 1768 he went to Gottingen, where he continued his studies under the celebrated Heyne, by whose aid he read with diligence and care the most prominent Latin authors. In 1770 he visited Leyden, and having secured the friendship of Ruhnken, by his influence he was invited to fill a Professor's chair at Amsterdam. Here he remained twenty-eight years. In 1798 he was appointed Ruhnken's successor at Leyden, where death terminated his labors in 1819. To the last, although afflicted with blindness, his mental powers remained unimpaired. As an instructor his qualifications were of a high order. He had the rare quality of interesting his pupils in a very high degree, of directing his en-

tire energies to the topic under discussion, and of making a subject perfectly clear and intelligible to his hearers. His method of instruction was the Socratic, in which it is said he particularly excelled. His success as a teacher is seen in the "literary career of his more distinguished pupils, who reflect in their writings the purity of his taste, the elegance of his Latin style, and the justness of his criticisms. All who came under his influence, reveal in their works, that sobriety in regard to ornament, and that rythmical cadence, which charm both the mind and the ear in the works of their master, and on which one reposes most delightfully, after being wearied with the toilsome rhapsodies and barbarous dialect of those who fail to make themselves intelligible, by not taking pains with the language which they use."

But we must stop, merely stating in conclusion that his principal works are *Annotations on Plutarch*, *Rœcepta Philosophia logicæ*, *Selecta Principum Græciæ Historicorum*, *Vita Ruhnkenii*.

GRECIAN EDUCATION. NO. VI.

The Athenians deserve our most particular attention, in treating of Grecian education. It is natural to infer from their great eminence in all the walks of literature, that their system of instruction must have possessed many excellencies. It is, as a historical fact, undeniable that the classic age of Greece was classic in Pedagogics. From all the great writers in the Attic dialect, may something be learned in regard to the course of training the body and mind, at Athens. Aristophanes, Xenophon, Plato and Aristotle, furnish us exceedingly interesting and very ample expositions of the views entertained, and the usages adopted by this refined and highly cultivated people.

Education at Athens was not restricted to any particular model from which there could be no deviation. It was not designed to produce uniformity. It partook of the freedom of the Constitution under which they lived. It expanded itself in the various directions, which, in a republican government, might be expected. It assumed at different periods various forms. The innovations were not always such as to give satisfaction to those who intelligently compared the past and the present. It was then, as it is now, innovation is not always improvement, and the abandonment of the processes of our fathers and the substitution of others for them do not necessarily issue in good. A picture of the contrast between his own times and the good old time of Athens, is drawn by the unrivalled dramatist, Aristophanes, in his celebrated piece, "The Clouds." The passages are quoted by Schwartz, and rendered in a

German translation. Professor Smith, in his admirable work on education, in the first part, which contains, in a brief space, the best History of Education in our language, known to us, cites these passages in the translation of Mitchell. Occupying a classic position in illustration of Athenian Education, we cannot forbear to incorporate them with our articles. As many of the readers of the Journal can refer to the original, and receive them in their original force and beauty, and as others can turn to the work above cited, or to Mitchell's translation of the Clouds and read them in our vernacular idiom, we propose to furnish them in a form less hackneyed before our public, but nevertheless placing them within the comprehension of many. It is the French translation of Aristophanes by M. Artaud which we use.

LE JUSTE. Je vais dire quelle était l'ancienne éducation, aux jours florissants où j'enseignais la justice, et où la modestie régnait dans les mœurs. D'abord, il n'eût pas fallu q'un enfant fît entendre sa voix. Les jeunes d'un même quartier, allant chez le maitre de musique, marchaient ensemble dans les rues, nus et en bon ordre, la neige tombât-elle comme fa farine d'un tamis ; lá ils s'asseyaient les jambes écartées, et on leur apprenait ou l'hymne "Redoutable Pallas, destructrice des villes," ou "Cri retentissant au loin ;" ils conservaient la grave harmonie des airs transmis par les aïeux. Si quelqu'un d'eux s'avisait de faire quelque bouffonnerie ou de chanter avec les inflexions molles et recherchées, introduites par Phrynis, il était frappé et châtié comme ennemi des Muses. Au Gymnase, ils devaient être assis les jambes étendue, pour que les voisins ne vissent rien d'indécent; chacun, en se levant, devait balayer l'arène à sa place, pour ne laisser aux amants aucune empreinte de son sexe. On ne voyait alors aucun enfant s'oindre au-dessous du nombril ; un léger duvet, comme celui des fruits, voilait le reste de leur corps. Ils n'allaient pas s'offrir eux-mêmes à un amant avec des sons de voix efféminés, et des regards lascifs. On ne leur permettait de manger ni raifort, ni l'*anethum* réserve aux vieillards, ni céleri, ni poisson, ni grives ; ils n'en sent jamais croisé les jambes.

L'INJUSTE. Tout cela est bien vieux, et remonte au temps des fêtes Diipoliennes, des Cigales, de Cecidas, et des Bouphonies.

LE JUSTE. C'est pourtant cette même éducation qui forma les guerriers de Marathon. Aujourd'hui tu leur enseignes à s'envelopper tout d'abord de vêtements ; aussi je m'indigne lorsqu'il leur faut danser aux Panathenées, de les voir tenir leurs boucliers devant leur corps, sans penser à Pallas. C'est pourquoi, jeune homme, n'hesite pas à me prendre pour guide : tu apprendras à haïr les procès, à ne pas frequenter les bains, à rougir des choses déshonnêtes, à t'indigner si l'on rit de ta pudeur, à te lever devant les vieillards, à ne donner aucun chagrin à tes parents, à ne faire rien de honteux ; car tu dois être l'image de la Pudeur. Tu n'iras pas voir les danseuses, de peur qu'au millieu de ton extase, une courtisane ne te jette la pomme, et ne fletrisse, la reputation. Tu ne contrediras pas ton père ; tu ne riras point de son grand âge ; tu oublieras les defauts de celui qui t'a eleve.

L'INJUSTE. Crois-le, jeune homme, et, par Bacchus, tu ressembleras aux enfants d'Hippocrate ! tu seras une vraie blette.

LE JUSTE. On te verra briller dàns les gymnases ; tu ne t'amuseras pas à debiter des fadaises sur la place publique, comme tant d'autres de nos jours : tu n'auras

point de procès pour un sujet frivole, où des recriminations obstinées peuvent causer ta ruine. Tu iras à l'Académie, te promener sous l'ombrage des oliviers sacrés, une couronne de joncs en fleur sur la tête, avec un sage ami de ton âge ; au sein d'un heureux loisir, tu jouiras de la douce odeur qu'exhalent le smilax et le feuillage du peuplier blanc, aux beaux jours du printemps, lorsque le platane et l'ormeau confondent leur murmure.

Si tu fais ce que je dis, et que tu suives mes maximes, tu auras toujours la poitrine robuste, le teint frais, les épaules larges, la langue court, les fesses charnues, et le reste petit. Mais si tu t'abandonnes aux mœurs du jour, tu auras bientôt le teint pâle, les épaules étroites, la poitrine resserrée, la langue longue, les fesses grèles, le reste grand, et l'esprit de chicane. L'autre te fera trouver honnète tout ce qui est honteux, honteux ce qui est honnète, et enfin tu te couvriras d'infamie, comme Antimachus.

The difference between an earlier period of simplicity and virtue and one of luxury and licentiousness is here clearly shown.

Amongst those whose educational views have come down to us from this people, Socrates occupies a very prominent place. Devoted to the acquisition and diffusion of truth, such as he regarded important to the well-being of man, avoiding the speculative for the practical, and the scientific for the moral, his whole life was devoted to the cultivation of the human mind by the peculiar method which he adopted. A spiritual accoucheur of great skill, he aided many in the production of truth, the generation of which was of lasting advantage to them. The memorabilia of Xenophon and the dialogues of Plato are full of proofs of the power of this man in detecting sophistry, in exposing error, and leading gradually, by a plan deservedly Socratic, to the the discovery of truth the most important in the sphere of human investigation.

Says Professor H. I. Smith, in his History of Education, "The peculiar mode of his teaching presents itself under a twofold aspect. In the first place, it was, undoubtedly, antagonistic, subversive, or polemical in its tendency. But in this tendency it was directed against the absurdities, the self-conceit, the selfish policy of the sophists, whom he completely unmasked, by treating them with that happy irony, which is from him called the Socratic. The positive direction of his pedagogic philosophy induced him to select his pupils, but to avoid establishing a school or sect of his own. Athens was not, at that time, the place for a Pythagorean Consociation ; yet, in so far, the ancient customs still prevailed, that pupils congregated about their teacher, to learn from him both in doctrine and practice. Such followers were his three most distinguished pupils, Xenophon, Plato, and Aeschines, all of whom wrote concerning him, and in the spirit which they had imbibed in their intimate intercourse with him. A compensation Socrates accepted from none of his pupils, although such as were rich, for example Crito cheer-

fully offered him all they had. He would not even accept presents from them, and when Aeschines gave himself to him, he said, "Very well; but I shall spare no pains to return you to yourself better than I have received you."

PARROT'S ASCENT OF ARARAT: *Journey to Ararat, by* DR. FRIEDRICH PARROT, *Prof. Nat. Phil. in the University of Dorpat, &c. Translated by* W. D. COOLEY. New York: Harper and Brothers, 1846.

This is a most interesting volume, replete with instruction, delivered in the most simple and satisfactory manner. It is not a mere ramble over the country, told in a still more rambling manner, but a scientific tour to a fixed point, recorded, from beginning to end, with all that clearness which truth and science require. The importance of his enterprise is very properly presented by the author in the following language:

"And yet there is one consideration of a peculiar kind which may be properly urged in its favor; for if the exploration of a great mountain redounds, generally speaking, to the advantage of science, and affords enjoyment to the admirer of nature—if even a bare rock or little hill, left untouched by the hand of man, affects, from a pure and simple sense of nature, the heart of the observer, what must not be the feelings of the christian when he fixes his eyes on that sacred mountain, where all the attractions of natural grandeur, so long concealed from our view, are united to the peculiar interest of a primitive monument and witness of one of the most remarkable events in the history of the world, and of God's immediate dispensation for the preservation of the human race!"

Passing over all the interesting matter collected by Parrot during his journey across the country, from Dorpat by Kaluga to the Don, and over the Caucasus, among the Cossacks, Kakhetians, and other tribes around Ziflis, as well as his valuable services in obtaining the level of the country between the black and Caspian seas, we proceed at once to his ascent of Ararat. It is well known that the mountain called by this name has two peaks; the former called Great Ararat, is in north latitude 39° 42′ and 61° 55′ east longitude from Ferro: the latter or Little Ararat, is in 39° 39′ north latitude, and 62° 2′ east longitude. These two points are thus about seven miles apart in a straight line, with a pretty wide valley between them. They are not immediately connected with any other mountain-range, but stand by themselves in solitary grandeur,

though they send off hills to the south-west, where the Euphrates has its head, and to the west whence the Araxes flows, and where it appears to unite with the Saganlúg, a branch of Mount Taurus. Though this mountain has been known by this name for more than three thousand years, yet it is not so now called by the surrounding nations. The Armenians call it Massis (the ancient *Macis*), and the Turks and Persians Agridagh. But the Armenian Chronicles inform us that one of their kings, who bore the name of Arai, fell in a bloody battle with the Babylonians upon a plain which was afterwards called from him Arai-Arat, or the fall of Arai, whence the province and the mountain, in all probability, derived their name.

Great Ararat rises to an elevation of 17,210 feet perpendicular, or more than three miles and a quarter above the plain of the Araxes. Little Ararat is not so high by three quarters of a mile, being only 13, 000 feet above the level of the sea. "From the summit downwards," says Parrot, (p. 144 et seq.) the Great Ararat "for nearly two-thirds of a mile perpendicular, or nearly three miles in an oblique direction, it is covered with a crown of eternal snow and ice, the lower border of which is irregularly indented, according to the elevations or depressions of the ground, but upon the entire northern half of the mountain, from 14,000 feet above the sea, it shoots up in one rigid crest to the summit, interrupted here and there by a few pointed rocks, and then stretches downward, on the southern half, to a level somewhat less low. This is the silver head of Ararat! Notwithstanding its great height Little Ararat is not always buried in snow, but is quite free from it in September and October, and sometimes also in August, or even earlier. Its declivities are considerably steeper than those of the Great Ararat; its form is almost perfectly conical, marked with several delicate furrows, which radiate downward from the summit, and give the picture presented by this mountain a very peculiar and interesting character."

The difficulty of reaching the summit of either of these mountains, especially that covered by perpetual snow, must, of course, be great. Foiled in a first and second attempt, nothing but very favorable circumstances, a careful preparation for the undertaking, and his indomitable perseverance enabled our traveller to gain the point at which he aimed, by a third effort, and after he had spent about two weeks upon the mountain. We give his narrative of his final success in his own words. After giving the details of his previous failures and the narrative of his first days' labors in the third attempt to ascend the mountain upon which he spent the night at an elevation of 13,800 feet above the level of the sea, he proceeds:

"At the first dawn we roused ourselves up, and at about half past six proceeded on our march. The last tracts of rocky fragments were crossed in about half an hour, and we once more trod on the limits of perpetual snow nearly in the same place as before, having first lightened ourselves by depositing near some heaps of stones such articles as we could dispense with. But the snowy region had undergone a great, and, for us, by no means favorable change. The newly-fallen snow, which had been of some use to us in our former attempt, had since melted from the increased heat of the weather, and was now changed into glacier ice, so that, notwithstanding the moderate steepness of the acclivity, it would be necessary to cut steps from below. This made our progress a laborious affair, and demanded the full exertion of our strength from the first starting. We were obliged to leave one of the peasants behind at the place were we spent the night, as he complained of illness; two others, tired in ascending the glacier, stopped at first only to rest, but afterward went back to the same station. The rest of us, without allowing ourselves to be detained an instant by these accidents, pushed on unremittingly to our object, rather excited than discouraged by the difficulties in our way. We soon after came again to the great crack which marks the upper edge of the icy slope just ascended, and about ten o'clock we found ourselves exactly in the place where we had arrived on the former occasion at noon, that is to say, on the great plain of snow, which forms the first step downward from the icy head of Ararat. * * * * *

After a short rest, we ascended, with the aid of hewn steps, the next slope (the steepest of all,) and then another elevation; but now, instead of seeing immediately in front of us the grand object of all our exertions, a whole row of hills had developed itself to our eyes, and completely intercepted the view of the summit. At this our spirits, which had never fluctuated so long as we supposed that we had a view of all the difficulties to be surmounted, sank not a little, and our strength, exhausted by the hard work of cutting steps in the ice, seemed hardly adequate to the attainment of the now invisible gaol; yet, on calculating what was already done and what remained to be done—on considering the proximity of the succeeding row of heights, and casting a glance at my hearty followers, care fled, and "boldly onward!" resounded in my bosom. We passed without stopping over a couple of hills, and there we felt the mountain wind; I pressed forward round a projecting mound of snow, and behold! before my eyes, now intoxicated with joy, lay the extreme cone, the highest pinnacle of Ararat. Still, a last effort was required of us to ascend a tract of ice by means of steps, and that accom-

plished, about a quarter past three on the 27th of September (9th of October,) 1839, WE STOOD ON THE TOP OF ARARAT.

What I first aimed at and enjoyed was rest; I spread out my cloak and sat down on it. I found myself on a gently vaulted, nearly cruciform surface of about two hundred paces in circuit, which at the margin sloped off precipitously on every side, but particularly towards the southeast and northeast. Formed of eternal ice, without rock or stone to interrupt its continuity, it was the austere, silvery head of Old Ararat. Towards the east, this summit extended more uniformly than elsewhere, and in this direction it was connected by means of a flattish depression, covered in like manner with perpetual ice, with a second and somewhat lower summit, distant apparently from that on which I stood above half a mile, but in reality only 397 yards, or less than a quarter of a mile. This saddle-shaped depression may be easily recognised from the plain of the Araxes with the naked eye, but from that quarter it is seen foreshortened; and as the less elevation stands foremost, while the greater one is behind, the former appears to be as high as, or even higher than the latter, which from many points cannot be seen at all. M. Fedorow ascertained by his angular measurements, made in a northeasterly direction from the plain of the Araxes, that the summit in front is seven feet lower than that behind or farther west; to me, looking from the latter, the difference appeared much more considerable.

The gentle depression between the two eminences presents a plain of snow moderately inclined towards the south, over which it would be easy to go from one to the other, and which may be supposed to be the very spot on which Noah's ark rested, if the summit itself be assumed as the scene of that event, for there is no want of the requisite space, inasmuch the ark, according to Genesis, vi. 15, three hundred ells long and fifty wide, would not have occupied a tenth part of the surface of this depression. Kerr Porter, however, makes on this subject a subtle comment favorable to the opinion that the resting-place of the ark was not on the summit of the mountain, but on some lower part of it; because in Genesis, viii., 5, it is said, "On the first day of the tenth month the tops of the mountains came forth;" but in vi., 16, it is stated that the window of the ark was above; consequently, Noah could have seen only what was higher than the ship, which was therefore lower down than the tops of the mountains: on these grounds Kerr Porter is inclined to look upon the wide valley between the Great and Little Ararat as the place where the ark rested. In this reasoning, however, he takes the above quoted texts of Holy Writ in a sense different from the literal one; for it is nowhere said that Noah saw the mountains coming forth,

but it is simply stated that after the ark had rested, the waters subsided, so that already on the first day of the tenth moon the mountains began to come forth; then, "after forty days Noah opened the window which he had made in the ark and let fly a raven;" and again, after three weeks, "Noah took off the cover of the ark, and saw that the ground was dry," respecting which he might have formed as good a judgment, or even a better, from the more elevated point than from the lower.

Should any one now inquire respecting the possibility of remains of the ark still existing on Ararat, it may be replied that there is nothing in that possibility incompatible with the laws of nature, if it only be assumed that immediately after the Flood the summit of that mountain began to be covered with perpetual ice and snow, an assumption which cannot be reasonably objected to; and when it is considered that on great mountains accumulated coverings of ice and snow exceeding 100 feet in thickness are by no means unusual, it is obvious that on the top of Ararat there may be easily a sufficient depth of ice to cover the ark, which was only thirty ells high."

THE COCHINEAL INSECT. (COCCUS.)

Of this insect, which affords the coloring matter of those brilliant crimson and scarlet dyes which have rendered cochineal so valuable in the arts, there are several species. The *Coccus Cacti*, so called because it is said to feed on a species of *Cactus*, the *Cactus coccinilifer*, occurs most abundantly in commerce. It is found in Mexico, from which the principal supply for the American and European market is derived, in the West India Islands, and in the southern parts of the United States. In Mexico a wild species is found, which however is scarcely ever collected for the market. Parrot, in his journey to Ararat, found another species in the vicinity of that mountain, and which, he thinks, is the *Coccus polonicus*, so called because it was produced in Poland, whence great quantities were derived, before the discovery of America. It is principally for the purpose of directing attention to this fact, that this notice has been introduced.

"The *Coccus* is a genus of hemipterous insects, having the snout or rostrum in the breast, the antennæ filiform, and the posterior part of the abdomen furnished with bristles. The male has two erect wings, the female is wingless."—*Rees's Cyclopædia.*

The Mexican Indians, particularly those of the provinces of Oaxaca and Guaxaca, form plantations of the *Cactus coccinilifer*, upon which they place the female insect. The ova, which she deposits, are soon

hatched out by the heat of the sun, and an innumerable progeny of insects, which are nearly all females, distribute themselves over the plants. These, after some time, nearly lose their power of locomotion, attach themselves to the leaves, grow rapidly in size, and are brushed off by means of a blunt knife, and destroyed either by the heat of a stove or dipping them enclosed in a sack into boiling water, and subsequently dried.

The insect of the shops is in the form of irregularly circular or oval grains, marked with transverse wrinkles. These are bruised and infused in water, from which alumina throws down a beautiful red precipitate called a *lake*, the salts of tin or acids produce the brilliant pigment called *carmine*, and the salts of potash a purple dye.

The insects observed by Parrot "were collected together in large nests, round the roots of a short, hard species of grass, the *Dactylis litteralis*, which grows in large quantities in the vicinity, where they may be gathered in abundance." "This," he farther remarks, "is a discovery of some interest to the commercial speculations of Russia, and one which, under proper management, might become a source of profitable occupation to those provinces. The value of these insects is well understood in Persia, where they are very generally used for dyeing scarlet, and, in fact, throughout every part of the East; the prepared insects being sold, sometimes at a very high price."

COLLEGE RECORD.

The Summer Session of Pennsylvania College commenced on the 21st ult. It gives us pleasure to be able to inform our numerous friends abroad, that the session has opened with the most encouraging prospects. Upwards of thirty new students have already entered the Institution, and several more are expected to arrive soon. The students, in attendance during last session, have, with a few exceptions, returned. The annual Catalogue, which will be issued in August next, will show a large increase above the last, and a larger number than has ever, heretofore, been in attendance, during any one year, at the Institution.

This College is yet comparatively in its infancy, and, having been permitted to gain its way into public favor almost entirely as its merits developed themselves before the people, without any puffing or unfair representation, on the part of its friends, it has but recently become generally known. That an institution, possessing so many facilities for the acquisition of knowledge, and holding out so many inducements for young men to enter its walls, should be patronized by an intelligent pub-

lic, when its claims are presented to it, is to be expected. There are nine persons, seven Professors and two Tutors, engaged in the department of instruction, each of whom is earnestly desirous of seeing his pupils advancing in mental and moral improvement.

Perhaps no institution in the land has a more correct and orderly company of students, and who feel a deeper interest in its prosperity, than this. As an evidence of the former, it may be said that the acts of discipline required by the Faculty are comparatively rare, and of the latter, that the Association, of which this Journal is the organ, has labored faithfully not only to beautify and ornament with walks, flowers, shrubs and trees the College grounds, which at this moment present a feast to the eye; but also collect a cabinet of curiosities and specimens in Natural History, and, with the aid of the Trustees, to erect a Hall suitable for the reception of that cabinet.

Corner-stone of the Linnaean Hall. We would inform our readers, that at a meeting of the Linnaean Association, held on Saturday last, Thursday the 23d prox. was designated as the day for the ceremonies connected with the laying of the corner stone of the Hall.

The petrified forest near Cairo, in Egypt.—From within several miles of Cairo to Suez, a distance of eighty-six miles, the desert is strewed loosely and at intervals with the fragments of an ancient forest, consisting of trunks, roots and branches, some of considerable length and size, and lying in all directions and positions. Their first appearance is that of rotten wood dug out from a peat-bog, which easily crumbles to pieces; but farther examination proves that they are petrified wood, in which the *carbon* has been replaced by *silica* (basis of flint,) and so hard as to strike fire with steel. So quietly and perfectly has the one been replaced by the other that the vegetable structure remains perfect, "the sap vessels and medullary rays, the bark and marks of worms and insects, and even the spiral vessels remain entire." Wonderful as is this forest in its extent and the perfection of its preservation, it is remarkable that it has excited but little attention, and that when, a few years ago, its discovery was announced to the French Academy, the account was not credited.

Delay of the present number.—We are sorry that unavoidable circumstances prevented the appearance of the present number of the Journal at the usual time of publication.

Acknowledgements of Donations to the Cabinet of the Linnæan Association of Pennsylvania College.

May, 1846. From *Capt. Focke*, Baltimore, Branch coral.

2. From do. Flamingo wings and feathers from the West Indies.

3. From do. Asterias, wings of Exocetus, and feathers of the White Crane.

4. From do. Sea moss, twig imbedded in coral, and shells.

5. From do. Bill of a Squid taken from the stomach of a Dolphin.

6. From do. Integument taken from a Whale.

7. *Mr. D. A. Martin*, Baltimore, case of Chinese Insects.

8. *Mr. Jno. Lynch*, Reptilia and Arachne in spirits.

9. *L. R. Buehler*, two Plaster Casts and a shell.

10. *Arthur Kennedy*, 8 Curacao and Danish coins.

11. *Mr. Joseph Baugher*, a relic of the political campaign of '40.

12. *Hon. Charles Barnitz*, Minerals.

13. *Rev. Prof. Hay*, do.

14. *J. R. Bradshaw*, Cotton in pods.

15. *J. R. Weaver*, a beautiful cross-section of fossil Calamite.

16. *Mr. Samuel Henry*, Indian curiosities and a coin.

Receipts during May.

Daniel Tritle of P., Waynesboro', Pa.	paid in full.	1st & 2 Vol.
Rev. Jno. Heck, "	"	
Henry Ealy, Gettysburg,	"	
Geo. Albert, "	"	
Geo. Martin, "	"	
J. G. Martz, "	"	
C. A. Brougher, "	"	
Philip Sheeder, "	"	
John Lynch, "	"	
J. C. Badham, "	"	
J. P. Smeltzer, "	"	
W. D. Roedel, "	"	
Prof. H. L. Baugher, "	"	1st & 2d Vol.
P. Born, "	"	
Rev. Jas. L. Shock, Reading, Pa.	"	
Prof. S. S. Haldeman, Columbia, Pa.	"	
Rev. J. W. Eyer, "	"	1st & 2d Vol.
Jas. Gallagher, Chambersburg, Pa.	"	
Rev. J. Martin, Mifflintown, Pa.	"	
F. Brougher, Ripley, Miss.	"	
Rev. E. Schwartz, Manchester, Md.	"	
John Hill, Esq. Hughesville,	"	
Jacob Miley, Mechanicsburg, Pa.	"	
Mathias Sheeleigh, Chester Co. Pa.	"	
Henry Stoner, per F. Benedict,	"	1st Vol.
J. G. Schmucker, Williamsburg, Pa.	"	

VOLUME II.] [NUMBER 9.

THE

LITERARY RECORD AND JOURNAL

Of the Linnaean Association of Pennsylvania College.

JULY, 1846.

CONDUCTED

By a Committee of the Association.

CONTENTS.

1½ sheet, periodical—Postage, 2½ cents, to any distance within the Union.

NEINSTEDT, PRINTER, GETTYSBURG.

THE LITERARY

RECORD AND JOURNAL

OF THE LINNÆAN ASSOCIATION OF PENNSYLVANIA COLLEGE.

VOL. II. JULY, 1846. No. 9.

GERMAN PHILOSOPHY.

THE DOCTRINES OF KANT, FICHTE, SCHELLING AND HEGEL.

By C. De Remusat, Member of the Institute of France.

[In 1836 the French Academy proposed prizes for the best Memoir upon German Philosophy. In 1838 they received six works of the kind, two of which the Committee appointed to examine them declared possessed of "undoubted merit," but in order that they might attain that excellence of which they regarded them as containing the germs, the committee advised that the decision should be suspended for *two years* longer. At the end of that time *seven essays* were presented, but the Academy wishing to give the authors ample opportunity to perfect their work kept the prize open until 1844. At this time *three Memoirs* were handed in and submitted to the examination of the same committee, of which M. De Remusat was the chairman, and upon these he made a long, analytical, and critical Report, concluding with the proposition of the Resolution that "the Academy award the prize to M. WILLM, the author of Memoir* No. 2, and make most honorable mention of M. GUIRAN, the author of Memoir No. 3, with the expression of regret that they cannot make him some special recompense." When this Report (occupying over 200 pages 8vo.,) was published, M. De Remusat prefixed to it an "Introduction" of near 160 pages additional, from which the following article is translated. The high reputation which De Remusat has gained by his various philosophical writings is here well sustained.—TR.]

"German philosophy has just completed a period comparable perhaps to the half century which in Greece followed the founding of the school of Socrates. KANT is the author of this great movement. His modest life presents nothing that elevates him to the tragic heroism of the son of Sophroniscus, although his virtue was no less pure; but the originality of his genius places him almost upon an equality with the greatest names in the history of thought. It is he who more resolutely than any one else has realized that idea of the moderns, that the mind

* This work of M. Willm is now published in Paris under the title "*Histoire de la Philosophie Allemande*, depuis Kant jusqu' a Hegel, par M. Willm, Inspecteur de l'Academie de Strasbourg"—in four large vols. 8 vo.

of man, in itself, isolated from everything that it reflects, from everything that it encounters, from everything that it supposes is the sole object of philosophy. Science thus conceived is at once both exact and profound. It gives to reason absolute certainty, and absolute doubt to everything else. If the world is problematic, if the human mind alone is not so, the existence of the world depends entirely upon the human mind, and reason creates everything that it conceives. This at least is what FICHTE drew from Kantianism—FICHTE that stoic patriot who believed in nothing but the soul and constructed upon the foundation of spiritual independence the whole of morality and the whole of politics. But if the thought produces everything that it comprehends, that which exists, exists only in conformity with thought, and the world is identical with the intellect; the description of the ideal agrees with the description of the real, and natural philosophy has for its type the philosophy of the human mind. It was to this that VON SCHELLING dared to push his conclusions, and which he endeavored to establish with the double power of system and imagination; possessed as he was of the ability like a Grecian philosopher to mingle physics and poetry. It is the same system of universal identity that HEGEL has invested with the vigorous forms of an immense deduction, disguising hypothesis under the appearance of algebra, and creating out of the whole a philosophy at once romanesque and demonstrative. Thus the idea establishes nothing but itself, said Kant. Fichte added: the idea gives the being. The being reproduces the idea, continued von Schelling. The idea is the being, concluded Hegel. See how a sceptical idealism has renewed beneath our eyes the pantheism of Spinoza."*

It was thus that upon a recent occasion I endeavored to characterize in a few words the developement of German philosophy from 1780 to 1830. Although these statements are summary, I believe them just, and it is to explain them as well as to state their grounds that I devote this introduction. Not that I am ignorant that, taken as a whole, the German philosophy cannot be reduced to a summary so succinct. It has presented during its course a spectacle most rich and varied. The four names that have just been cited are the greatest, but they are not the only ones that deserve an extended memoir. There have been on the other side of the Rhine, within the last sixty years, a great number of collateral schools, opposite systems, episodical doctrines, attempts at eclecticism which deserve a place in the science. But we are not here

* Discours prononcé dans la seance publique annuélle de l'Academie des sciences morales et politiques, le 17 mai, 1845.

writing a history of philosophy. We only aim at bringing together some general observations suggested by the four greatest systems that modern Germany has produced. It is wished thus to prepare the reader better to comprehend them so as to be better able to judge of them. Above all we aim at clearness, and to attain this, we translate, as far as possible, into common language some fundamental ideas which the Germans seem to take pleasure in enveloping in the studied obscurity of a language worthy of the scholastics.

Let us, then, return to the philosophy of Kant and attempt to explain with simplicity the principles of that system, in order that we may the better lay hold of the three great systems that have come forth from its bosom. Our own observations will naturally come at the close of this exhibition.

I. Kant.

Many have repeated what Kant was fond of saying, that he had attempted in the science of the moral world the revolution that Copernicus had accomplished in the science of the physical world. Thus, the latter transferred the movement of the sun to the earth; the former having to give an account of the system of knowledge, had transferred it from the object that was to be known to the subject that knows. This idea is not altogether original. Without going back to antiquity, without citing the celebrated words of Protagoras, an authority quite proper to render him who adduces it suspected, it is certain that since Descartes, since philosophy has taken the human mind for the centre whence all its researches radiate, the ruling idea in science has been the fundamental idea of Kant. This is, after all, the principle of the psychological method, and the first lines of Condillac's "*Essay upon the origin of human knowledge*," have sometimes been cited, and they might serve as the motto for the "*Criticism of the pure reason.*"* But never was that idea so fully received, so exactly followed, or applied with so much profundity as by the philosopher of Kœnigsberg; and it is thus that it has become the proper characteristic of his doctrine.

We shall sum up this doctrine in as short and simple language as possible.

Kant studied human knowledge in itself; this is the ultimate signification of the expression *pure reason.* As his starting point, he took

* "Whether, metaphorically speaking, we raise ourselves up to the skies, or whether we descend into the lowest abyss, we do not depart from ourselves; and we never perceive anything but our own thought." (1st part, sec. 1, ch. 1. See also, *De l'art de penser*, 1st part, ch. 1.)

for granted two things which he received from his predecessors. First, that in fact all knowledge commences with experience, that is to say, that we do not know anything before our sensibility is affected by something which appears not to come from it, so that the internal activity by which we know is originally passive. The second is only another aspect of the first, viz. that every internal modification reducible to knowledge is perceived by him who experiences it; he has consciousness. The *me*, or as Kant says, the *I think* accompanies every act of knowledge; we have consciousness.

As we penetrate further into the system of Kant we cannot but wonder that he at the outset adopted those two points without examining them, or at least without perfectly defining them. He who piqued himself upon remaking everything, here took upon trust; 1st, the principle of sensualism or of empiricism; 2d, the principle of psychology as the science of observation. This empirical concession is a singular commencement for a transcendental system.

The act of knowing, whatever it may be, may pass over into a judgement; external perception itself is a natural judgement (Reid.) In every judgement one of these two things happens: it is affirmed either that a thing is the thing that it is,—that this thing is such as we necessarily know it whenever we know it; or that the thing is something that we do not know anything about, that it is such that we are ignorant what it is. In the first case the judgement does nothing but express, explain, unfold our knowledge, it is analytic. In the second, it adds a new knowledge to the antecedent knowledge, it produces a more complete notion of the subject. It makes an addition of the subject and of its attribute, that is to say, it is synthetic.

We remark again that this observation of Kant supposes the logical theory of judgement, and that consequently logic, of which this theory is the basis, may here be considered as an admitted principle, as a knowledge accepted anteriorly to all science. It is another premiss to be joined to the other two, viz. sensible experience and consciousness.

But among judgements, of whatever sort, some are contingent, others necessary. The latter are judgements that express not a thing that might not have been, but a thing the truth of which is wholly in the reason. That which is necessary cannot but be, unless reason cease to be reason. But can necessary judgements be derived from experience? Experience is nothing but a fact, or rather a certain phenomenal modification of our external or internal sensibility. This modification might never have taken place, it is accidental; but when it has once taken place, our judgements are a necessary result made. Are these judgements de-

rived from experience? How can experience which is contingent produce judgements that are not so? Of an internal modification, for instance, I judge that it has taken place; this is a judgement of experience. It is contingent; for I by no means judge that it has necessarily taken place. But I thus judge, that after it has taken place, it cannot but have taken place. It is a necessary judgement which no experience teaches me. But judgements which do not in any respect depend upon experience, are pure judgements. That a pure judgement should be synthetic, that is to say, that it should by the attribute add a knowledge to the knowledge of the subject, this cannot happen if there are no pure cognitions, that is to say, cognitions that are not altogether dependent upon experience, that are not induced *a posteriori* from experimental perceptions; in other words, cognitions *a priori*. To seek after, to determine, and to arrange these cognitions, or rather that which is pure, or *a priori* in knowledge, is *to criticise* the pure reason—to construct transcendental science.

No external object can be perceived out of space. Space itself is not perceived; there are objects that we can only perceive upon the condition of space. It is therefore the condition not of the object, but of the perception. It is necessary to the experience, to the sensibility that perceives; it is a pure form of the sensibility, and this pure form is *a priori* in the sensibility.

No internal perception can take place but in time. No internal fact, no affection of the me is perceived in space; but we cannot have consciousness but in time. And as there is here neither consciousness nor perception of time, time is not given *a posteriori*, for no internal perception is possible without it. Time is therefore another condition of internal perception, (not of that which is perceived), or, a pure, *a priori* form of the sensibility. Space and time, the two pure forms of the sensibility, are the object and the basis of the criticism of the pure, or *a priori* sensibility.

Besides the sensibility, the me knows by the understanding: that is to say, perceptions are converted into notions. The notion or the conception is our thought of the perceived phenomenon. Every notion or cognition of the understanding has the form of judgement. There is no notion or intellectual cognition that cannot be reduced to a judgement. But there are many categories of judgments; there are judgements of quantity, of quality, of relation, of modality. These are the foundations of the different categories of the understanding. The categories of judgements, which comprehend all sorts of possible judgements, are twelve in number. And there are no other categories of

things. These are not and cannot be other than what we can know, that is, affirm or judge of things. All notions, therefore, must be referable to one or the other of these categories of judgements.

We remark here, what has already been remarked elsewhere, that this enumeration is taken for granted but not demonstrated, and that the reason of no part is here given.

These notions, or pure judgements can be transferred into certain universal judgements; upon this condition solely do the objects of perception appear to us possible. These judgements are the ultimate principles of the pure understanding, or axioms of the understanding. They are pure, they are *a priori;* for they do not depend upon any experience, being as the laws of the possible experience; laws that are in us, since experience itself is entirely ours. Thus the understanding, like the sensibility, has nothing that is invariable or universal except subjective forms, that is, forms that are necessary to the subject that understands and perceives, to the intelligent and sensible me.

Reason rules the understanding, and transforms into absolute principles the intuitions and notions, or rather, subjects all those intuitions and all those notions to certain principles which appertain to it, and which it finds within itself, or which appear to be its proper laws. Yet, all absolute as they are, these principles are contradictory, or at least pure dialectics which has established them theoretically, has established them as directly opposed to each other. The reason, that faculty of rules, that faculty of the absolute, is full of antinomies. It suggests speculatively insoluble questions. To all the essential points of the rational sciences it opposes contradictories. Meanwhile it raises itself in everything to a certain ideal that pleases it, of whose possibility it is satisfied, although it cannot objectively legitimate (or give a clear demonstration of) real existence.

Above all exists a moral ideal of which the authority is absolute. The good or the evil in our sentiments and in our actions only exists for the reason, the obligation which results being in no sense a physical necessity, but purely moral; in other terms, the conception of duty existing only for the conscience and for the will, we can comprehend that in morality the subjective is confounded with the objective, and that it is sufficient for the law of duty to impose itself upon the me as a necessity relative to it, in order that it may become an absolute necessity. Thus the theoretical principles of the practical reason are invested with plenary authority both of fact and of reason, and communicate a part of that authority to notions which are their consequences or their logical conditions. The fundamental truths of all religion which cannot be de-

finitively established by the pure reason, are certain for and by the practical reason, which without them would have no foundation. In other words, morality cannot be demonstrated for the very reason that it is absolute, and everything that it implies participates in its authority.

IDENTITY OF LIGHT, CALORIC, ELECTRICITY AND MAGNETISM.

These material agents have long been known to possess many points of near approximation to each other in their various manifestations. As the boundaries of our knowledge became more extended through scientific investigation, each new discovery of their properties revealed to us a nearer relationship between them, so that the opinion of the identity of their cause or origin was very generally adopted by philosophers. Of the truth of this opinion the recent discoveries of the distinguished London Professor, Michael Faraday, have furnished us with the most satisfactory evidence.

It may not be unacceptable to our readers to have a brief account of some of these discoveries, in connection with facts previously known and belonging to our common stock of knowledge, spread out upon the pages of the Record and Journal.

1. *Light and heat* or caloric, though they obviously have many points of difference, have so many of near relationship and resemblance as, at once, to arrest the attention of every observer.

Thus, when a body is heated, or according to the common view caloric is accumulated within it, it becomes, at first, faintly, and, as the temperature increases, at length brilliantly luminous. The increase of the light evolved is in some degree proportionate to the temperature of the body. At low temperatures it may be supposed light is given off, but in quantities too small to make a sensible impression upon the organs of vision, whilst at high temperatures the quantities are so great as to make a powerful impression upon the eye. Here *the one seems to be converted into the other*, or to bring it into activity.

Again, in the solar ray, as well as in all cases of combustion, *these two agents always accompany each other*. Every one knows that the same means, as for example a lens or reflector, which is used to concentrate the one into a focus, is applied to accomplish the same object in regard to the other. And this shows that they are governed by substantially the same laws. Both are capable of being *reflected*, *transmitted*, *refracted*, and *polarized* under nearly the same circumstances. The law of reflection is the same; the good reflectors of light are in general good reflectors of heat, the coincidence being only an approximation;

those substances which transmit light or are transparent, mostly transmit heat also or are transcalent, although some transparent bodies are scarcely transcalent, and *vice versa;* transparency and transcalency being rarely proportionate to each other. A similar parallelism is also found to exist in reference to refraction and polarization. When it is remembered that a great difference in these respects exists between heat of different intensities, just as there is between light of different colors, and that the higher the temperature or greater the intensity of the heat the more nearly does it approach light in all its laws, the probability of a community of nature between them, or of their having a common origin becomes almost a certainty.

But this common cause or agent, to which both are referable, may be so modified in in action as to present but one class of the effects at the same time. The lunar ray, for instance, which is a reflection of that of the sun, comes to us almost totally deprived of every trace of heat, this, in ordinary language, being absorbed by the surface of the moon upon which it falls; and some animal and vegetable substances in a certain stage of decay emit phosphorescent light, whose heat is inappreciable, just as the light from bodies of low temperature is incapable of being observed. In the solar spectrum there is likewise a partial separation of the light and the heat.

2. Between *light, heat, and electricity*, there is also a mutual and intimate relationship. In every case of the passage of free electricity from point to point, as in the discharge of an electrical jar or a flash of lightning, light and heat are both evolved. These three are either so many manifested effects of a common agent, or two of them the product of the third, unless it be supposed that, owing to a strong and mutual affinity, they accompany each other. That the light and heat are not due to the sudden condensation of the air by the electricity in its passage, is proved by the fact that they are alike evolved when it passes through a vacuum, as shown in the experiment with a long exhausted tube, or by the Auroral streamers which have their existence, to say the least, in very highly rarified air. In the Voltaic arrangement these three agents seem to be evolved simultaneously or give rise the one to the other; for charcoal may be ignited, even in vaccuo, emitting heat the most intense, and light emulating the sun in brilliancy. Besides these, other points of approximation might, if necessary, be cited.

3. But the most intimate relationship is found to exist between *electricity* and *magnetism.* They are perfectly reciprocal, the one, with equal ease, giving rise to the development of the other. Many of their laws are almost perfectly convertible. In both, bodies similarly charged

repel, and dissimilarly attract each other. Both are developed by friction, and by the inductive influence of bodies already excited. And in reference to both it may be said that their peculiar effects are more easily manifested in some bodies than in others. Vitreous and resinous substances and a few others, are, for example, easily put into the state of excitement called statical electricity, and remain in that condition with some degree of permanency; but the excitement in all others is transient, except when they are insulated by the interposition of one of the former. So iron, nickel, and cobalt are the only substances which have been known to exhibit that permanent excitement called magnetism, and have therefore been regarded as constituting the whole class of *magnetics.* But Faraday has recently shown that seven others belong to this class, being capable of exhibiting the magnetic condition in a limited degree. As this subject is yet new and approached from only one direction, may we not suppose that farther research will yet prove that, as in electricity, all bodies, without exception, under proper conditions will be found capable of magnetization.

But their close connection is more fully shown by their reciprocal action.

Electricity produces magnetism. If an electric current be made to pass at right angles to a short rod of soft iron or steel, magnetism will be developed, in the former case temporarily, in the latter permanently. If the current be made to flow through an insulated wire, wound so as to form a helix or hollow cylinder, into which the rod can be introduced, the magnetic effect is increased in proportion to the number of turns of the wire, which thus makes the one current equivalent to as many currents as there are turns. Magnetism far transcending in power any that was known previously to the discovery of this arrangement for its production, is produced in this manner. The magnet thus formed is called an electro-magnet, and the interesting branch of physical science to which it has given rise, has been denominated Electro-magnetism. It is the electro-magnet, it may be remarked, which furnishes the moving power in the writing apparatus of the great American Telegraph.

Magnetism produces electricity. When a permanent steel magnet is thrust into the helix or hollow cylinder of wire above alluded to, an electric current at the same time flows through the wire. The same effect is prodnced when a permanent magnet is made to approach either end of a bar of soft iron previously introduced into the helix. Upon this principle is founded the construction of the Magneto-electrical machine, and the department to which this class of effects is referred is called Magneto-electricity.

4. But Faraday was the fortunate discoverer of a new and remarkable relationship between light and electricity or magnetism. He proved that a beam of polarized light may be caused to rotate between the poles of a magnet and the converse.

To explain this, let us suppose a beam of light to fall at an angle of incidence of 56° 45′ upon a plate of glass whose plane is placed at right angles to the horizon. This beam will be reflected at the same angle and proceed horizontally. If now it fall at the same angle of incidence upon a second plate of glass placed so that its plane of reflection will be vertical, instead of being *reflected* as ordinary light would be, it will pass *through* this plate. The beam has evidently been changed by its reflection from the first surface and is called *polarized* light. If now the plane of reflection of the second surface be turned round 90°, so as to be horizontal and parallel to the first plane, the light will suffer reflection, and not be transmitted. The same effect without changing the position of the second plane, is produced by the interposition of a number of solid and liquid substances between the two reflecting-planes, so that the polarized beam may pass through them. The beam is by their agency so changed as to suffer reflection where it would otherwise have been transmitted, and *vice versa;* the effect is the same as if the beam had been turned round on its axis. Now let us suppose that, instead of causing the polarized beam to pass through those solid or liquid substances alluded to, it were made to pass between the jaws of a powerful electro-magnet, the beam would be made to rotate in like manner; that is, as long as the electric current flowed around the soft iron and made it a powerful magnet, the beam of light would be reflected from the second plate of glass, but as soon as the electric current ceased to flow and the soft iron lost its magnetism, the beam would become incapable of reflection. This is substantially the discovery of Faraday, and shows a wonderfully close connexion between light and electricity.

5. *On the Magnetic condition of all Matter.* Prof. Faraday has also opened a new field of peculiar interest by his researches into the magnetic condition of various kinds of matter. The poles of a powerful electro-magnet are placed, one on each side of a bar of the metal, glass, or other substance whose magnetic condition is to be examined. The bar may be two inches in length and half an inch each in depth and breadth. It is delicately suspended by means of a few fibres of silk from a cocoon, and the whole protected from currents of air by being covered with a glass jar. If now the bar be inclined at an angle of about 45° to the line joining the poles of the magnet, and the magnetism excited by means of battery connection, the bar will move from

its position so as either to coincide with the line of junction of the poles, or to be at right angles with it. Iron and nine other metals assume the position of coincidence, or become magnetic by induction and arrange their ends opposite to the poles of the magnet. Among these Iron occupies the pre-eminence. All other substances which have been tried, are found to arrange themselves at right angles to the line of junction, and not being susceptible of magnetic excitement themselves but permitting its influence to be exerted through them, have been denominated by Faraday *diamagnetics*. Gaseous and liquid bodies belong to this class.

Prof. Faraday thinks it not impossible that the solar light, in accordance with the facts above stated, (Art. 4,) may originate the earth's magnetism, and the air and water constitute the diamagnetic media in which this force is generated.

From the facts and circumstances which have been thrown together in this paper, we make the inference that one imponderable, all-pervading agent is the cause of all the phenomena of light, heat, electricity and magnetism; each being only a modified effect of its action.

THE GULF STREAM.

We were recently present when this subject, which has so often perplexed the mariner, was introduced, and, discovering the incorrect views entertained by many respecting its origin, we propose to furnish a brief description of the phenomenon, with some explanation of its cause, not, however, designing to present any new theory, or supposing that we can instruct your more learned readers. Our object is simply to give a condensed account of the Gulf stream for the benefit of those who make no scientific pretensions.

What is the Gulf stream? We describe it as a body of water constantly issuing from the Gulf of Mexico, running in a north-easterly direction nearly parallel to the Atlantic coast on the outer edge of soundings, its velocity being so great that it retains the temperature of the tropical water, until it passes the banks of Newfoundland. By examining with care the temperature of the ocean water, you can tell precisely the time when you enter the Gulf stream, when you leave it, and when you arrive on deep water soundings. It passes at the distance of seventy-six miles from the coast of the Southern states of North America. This distance increases as you proceed in a northward direction. Its velocity diminishes towards the North, at the same time that its breadth increases. Its course is greatly influenced by the direction of the wind.

a south-easterly wind drives it nearer the coast, and a north-westerly wind drives it further out into the ocean. Near the Bahama coast the breadth is fifteen leagues, in latitude 28° 30′ it is seventeen leagues, and under the parallel of South Carolina from forty to fifty leagues. Vessels may shorten their passage from North America to Europe by keeping in this stream, and in returning by avoiding it.

The rise of the mercury in the thermometer always indicates the presence of the Gulf stream. It is also known by the appearance and elevated temperature of the water, and, in fair weather, by its smooth and clear surface, as well as its indigo-blue color. The margin of the stream is marked by a ripple on its edge; in some places the water appears to boil and in others to foam like the waters of a cataract, even in a dead calm and in fathomless spots. It is further recognized by the gulf-weed which is every where interspersed, and by the heat of the adjacent atmosphere which in the winter season is very perceptible. In high latitudes it is always covered with a thick fog.

What is the most rational hypothesis as to its origin? How is it occasioned? Several explanations have been given. It has been ascribed by some to the influence of the water flowing from the Mississippi. This to us seems unsatisfactory, for although the river may contribute in some small degree to the formation of the stream, our objection is founded on the inquiry, How is the greater warmth of the water than the surrounding ocean water accounted for? In addition, its extent is greater than the Mississippi, being in some places fifty miles.

2ndly. The revolution of the earth has been offered by some as an adequate explanation of the phenomenon. If this view be correct, why, we ask, is its influence not general in its operation. We find that even in the same stream there is a variation. 3dly. Others attempt a solution of the difficulty by referring its origin to a subterraneous passage at the isthmus of Darien, and its heat to the presence of volcanos. This has the least claim to our favor, because the water on the Atlantic side is always the higher, being fourteen feet higher than on that of the Pacific side.

That which we are disposed to regard as the most plausible explanation is its reference to the easterly trade winds, the impulse given by them to the surface of the water, driving it into the Gulf of Mexico, where, getting above its natural level, it endeavors to seek it by running between the Bahamas and the Florida shore; it then takes a direction along the coast of America over the southern extreme of the Bank of Newfoundland, thence through and among the Western Islands, then it takes a south-easterly direction, spreads out to a greater breadth among

the Canary Islands, and to the southward of these takes to the Barbary shore as far south as Cape Blanc, where it arrives at its first starting point, and is again under the influence of the trade winds.

PHONOGRAPHY.

A PLEA FOR THE DEAF AND DUMB.

The miraculous element in many of the Saviour's wondrous works was not so much the nature of the effect produced as the mode of its production. Many of the sick he healed could doubtless have been cured by the use of natural means, but he cured them *at once and with a word.* "The dumb speak!" By an act of divine power, he instantaneously unlooses their tongues, and communicates to them the gift of speech in its perfection. As truly a miracle as the raising of the dead.

But the dumb now speak. Deafness, which was long considered an insuperable obstacle to the acquisition of speech—as the necessary cause of hopeless silence, now no longer seals the lips. He may be deaf but he is not dumb. Though he hears me not, he *sees* my words, as they fall from my lips, and answers me intelligently with a voice that had seemed condemned to be forever the vehicle of incoherent sounds, less intelligible than the instinctive cries of the brute. It seems almost as though a new sense had been imparted to the mute, who is taught not only to catch up the soul of the printed page, but to seize the thought of the speaker by watching merely those muscular movements which are necessary for the enunciation of his words, and which, as they are merely a means to the end, (the spoken word,) we who are blessed with the auditory sense, so seldom observe at all.

Now why is it, that this astounding discovery, that mutes can be taught to understand spoken language and themselves to speak, has not sent a thrill of joy throughout our land; that our Asylums for the Deaf and Dumb have not become the sources of living language to the mute? Why? *Because the English language is not phonographic!*

The want of a better system of signs for our sounds, is a theme that begins to sound familiar to the readers of the Journal. Would that its importance were more generally felt and that a deeper interest were manifested in the recent efforts to correct this great evil! The difficulties of such an undertaking are great, but not insurmountable, the advantages would be incalculable.

A few days since a pamphlet was handed to me entitled, "Thoughts on a Reform of the English Alphabet and Orthography, by a Teacher." The author feels the importance of the subject and presses home upon

his readers the necessity of immediate action with a very commendable zeal. His essay has evidently been prepared in haste, but it manifests a considerable acquaintance with the difficulties of an attempt at a reform of this kind, whilst at the same time it shows how the most of them might be obviated. It suggests the holding of a meeting for the purpose of bringing this subject fully before the public and proposing measures for a thorough reform.

In this essay some of the faults of our present system are pointed out, viz.:

"1. We have in our written and printed words so many silent letters.

2. Our letters do not represent each a distinct element of words.

3. The same letter is at one time gifted with one power, at another time with a very different sound.

4. There are elemental sounds of our language not represented by our symbols.

5. Our capital and small letters are often radically different in form.

6. The names of the letters give no aid in learning their power.

7. The diphthongs are not properly represented by the combinations of vowels now employed to express them.

8. Several of our letters two closely resemble each other."

These are some of the principal difficulties which present themselves to a learner who has been blessed with the use of all his senses, and they are enough to give the child a settled hatred of books and to make the foreigner, who attempts the mastery of our tongue, bitterly execrate the load of useless encumbrances that envelop so completely the object of his search.

But if these are such formidable barriers in the way of the man whose ears are open and whose tongue is loose, how immensely is not their insurmountability increased in the case of him, who is to supplant the sense of hearing by those of sense and touch. When, with one hand upon the larynx of his instructor, and the other upon his own he begins with the deep guttural A, and rises through E to I, or through O to U, with these vowel-signs successively laid before him as he succeeds in enouncing them, he naturally concludes that he has mastered the open sounds, and now knows their representatives. And so he has, in the noble language of which our own is so degenerate a progeny. The *German* vowel signs uniformly represent the same sounds and their consonants are almost perfectly phonographic. But alas! has the poor mute the misfortune to be born among the conquerors of the Sikhs or the sticklers "for the whole of Oregon or none," he may give up in des-

pair. "Fifteen vowels and diphthongs are represented in our language in more than seventy ways! One of our elementary sounds has at least nine representatives! I mean *e*, represented in nine different ways in the words *me*, *beat*, *beet*, *mien*, *key*, *receive*, *marine*, *people*, and *coeliac*; and these, be it remembered, all denote but one power of *e*. Another power of *e* is denoted in six ways—as in *met*, *dead*, *said*, *oedipus*, *guest*, *friend*. On the other hand most of our vowel letters have several powers; thus *a* has three, *e* four, *i* three, and so on; in all over fifty; but these are not distinct, i. e. *a* has in some situations a power which is also denoted by *e*, *u* the same as *e*, *i* and *o*, and *o* even in one case the same as short *i*, (women). The *combinations* of vowel marks represent *simple* vowel sounds, and that in the most fantastic manner; thus *ey* in *they* is equivalent to one power of *a*, but in *key* it denotes a power of *e*. In short no analogy or rule is followed. Amidst this irregularity and confusion, instead of wondering that so many cannot read, I am surprised that so many accomplish the task."

Yes, it is a matter of surprise that so many are content to wade through all this mire, and that such a mass of arbitrary and awkward irregularities does not defy their patience. As for the poor mute, we may condole with him, but no one can wonder at his silence, for who would encourage him to undertake so herculean a task as this? Add to the illustrations given above, another, viz. the termination *ough* (e. g.) in *rough*. The mute commences the word, and by rolling his tongue against the roof of his mouth he intimates to you that he understands the power of the first letter, *r*. Next comes *o*, and after it *u*, both of which he enounces distinctly. The *g* he recognizes and expresses its value by pressing the root of the tongue and the palate together and then exploding the breath from his lungs. The *h* is the aspirate, which he has easily learned to form, being nothing more than a rapid expiration. Now he has them all, and he is next to combine them into one syllable, *r-o-u-g-h*. He looks up in amazement. You give him to understand that all that array of signs must actually be expressed by one effort, and you teach him the sound of this remarkable monosyllable. There are *enough* that are quite as *tough*. Presently he meets with *though*, and very naturally he pronounces it *thuff*. Has his teacher succeeded in showing him that *ough* expresses sometimes no more than simply *o*, he next stumbles upon *plough*, where *ough* = *ow*. Even here his perplexities are not at an end, for he has not yet got *through*.

Reader, can you still smile at the oddities of English orthography as it existed three hundred years ago, and not blush at the criminal indifference that perpetuates such absurdities as these? For the sake of

the mutes, if for no other reason, the proposed reform should be attempted. The writer had the pleasure of conversing with a class of twelve or thirteen boys, in Berlin, Prussia, perfectly deaf, who had been taught to speak distinctly. It is true, their voices were by no means musical. Some of them squeaked, others grumbled; they seemed to have no control over their voice as far as the modulations of its tones was concerned; but although the instrument, in the providence of God, was very imperfect, their teachers had been remarkably successful in teaching them to play well upon it. One of them, a lad of thirteen, who could not hear even thunder, (though he could feel it), spoke in a perfectly natural tone, and replied intelligently to all our questions. At the same institution there were from twenty to thirty others in various stages of improvement, and the cases were very rare in which the effort proved unsuccessful, and these, the Principal assured us, were generally such in which there was some natural defect in the organs of speech.

Now this seems to be utterly impossible in our tongue.* But need it continue to be so? *Raised letters have given literature to the blind; a reform in our alphabet and orthography would hasten the day when our dumb shall speak.* C.

LAMP-LIGHT SCRIBBLINGS OF MOON-LIGHT MUSINGS.

On as lovely a moon-light night as ever poet fancied or Angel saw, (as your romancer would say,) an old cumbersome caricature of a coach, driven by a drunken Jehu, rattled slowly yet noisily along the quiet streets of G—. The "iron tongue of Time" had already spoken the hour of ten, when we were deposited under the sign of the Spread Eagle. As your informant was compelled to leave early next morning by the western stage, he could not let the opportunity escape of seeing once more the scenes consecrated to him by the sweet associations of youth. But a few hundred paces from the tavern arose a majestic pile of marble splendor, reposing in solemn and impressive beauty in the silver radiance of an unclouded moonlit-heaven. Thither, all jaded and travel-worn as I was, I sallied forth, unaccompanied, except by the "still small voice" of faithful Memory, along a gravel walk, which it seems had usurped the place of the gutters, mud-holes, and all the other inconve-

* The case of a lady who is well known to the writer, perfectly deaf and yet able to converse in English, is no proof of the contrary; for this individual was nineteen years of age before she began to lose her hearing, and gradually accustomed herself to understand others by closely watching the movements of the organs of speech, whilst she was still partly in possession of this sense.

nient *et caeteras* that "long time ago" used to trouble our nocturnal pedestrians so much, disturbing the equanimity and breaking in harshly upon the reveries of many a "nice young man," who should by chance, in the deliciousness of his trance, forget there were such unpoetical, matter-of-fact-things as mud and water in existence. *Via Benedicta* traversed, I found myself strolling along the beautiful walks that intersect the Campus, broidered by every variety of bud and bloom; the grounds around me, which, if I recollect rightly, were then an unrelieved expanse of utter sterility, "herbless, treeless", were now swarded in the richest green.

The College bell had sounded the signal for *Somnus* to resume his sway, yet many tapers remained unextinguished—the light shines as familiarly through one well-remembered window, as though it were still my own sanctum and I had just returned from an evening's call expecting to find my studious chum sitting by the untrimmed lamp, Hutton in hand, busily engaged—*sleeping*. Around each twinkling taper I can almost fancy I discern the well-known features of some former friend. There—do you observe that dim light—that's Jack's room—there surely are a chosen few assembled to discuss a rich, steaming mince pie, whilst those, who were so fortunate as to have had "rope," narrate the adventures of the evening. So perfect is the allusion that I can hardly invest my mind with the reality that I am no longer a youth at College, that the friends whom I had loved are not still lingering around the places where I knew them.

Indulging such dreamy reveries I stood, while the arch enchantress, Memory, was busy in recalling incidents heretofore forgotten, and forms and features of friends for a long time unthought of. Yet still, at length, the feeling began gradually to force itself upon me, that I was a lone stranger, with no acquaintance to welcome me back to my *Alma mater*. The many and dear friends (or rather brothers, for so my heart acknowledged them,) whom I had known and loved and left the happy inmates of these cloisters, where are they? Scattered like the kindred leaves from some tall monarch of the forest before the wild autumnal blast, no two together. Not one of all that numerous band to greet my return—not one kindred soul to recur with me to the days of "*Auld lang syne*." Ah! how many sad and sorrowful emotions, how many painful recollections of bright and sunny hours long since gone forever! how many linked associations of commingled pleasure and pain, how many known and familiar faces of "loved and lost ones" throng upon the half suffocated mind, while gazing upon one's *Alma mater* after long years of absence! Does the pleasure or pain predominate in these saddening re-

trospections? Is it agreeable to look upon scenes, once alive and joyous with objects of our love, now filled with strange forms with whom our souls acknowledge no acquaintance? Yet despite the damping chill which this is calculated to have, we do experience a heartfelt though melancholy pleasure in communing with these mute inanimate objects, gifted as they are with a most eloquent tongue to speak to us mournfully of other days. 'Tis sweet to linger and to muse whilst

> "Up springs at every step to claim a tear,
> Some little friendship form'd and cherish'd here."

College days and College friends, oh! what unwritten volumes of cherished recollections are unclasped, as by Prospero's wondrous spell at the bare mention of these words! Who does not involuntarily and unconsciously exclaim, "I would that I were again a student!" Who would not ardently desire to live over those quiet halcyon days spent within College walls? Man, care-burthened and thought-worn, finds no such paradisean scenes in all his earthly pilgrimage, as in those tranced moments, when the young heart sipped bliss from a flower-strewn world. Then was it, that he experienced the height, and depth, and intensity of the happiness immense couched in that word, (so often misused,) Friendship. Yes, friendship! not such as the mercenary spirits of this sordid world barter in; not such as binds the guilt-ridden soul of accomplices in crime in the iron fetters of dread; not that meretricious and glittering counterfeit, which the treacherous display only to deceive, perchance that they may finally destroy; but that sacred affection that knits together angel hearts amid their bright bowers of bliss—a communion fraught with all that is holy, pure, and joyous, bearing with it the breathless perfume of its heavenly origin, and rewarding its favorites with the rich fruits of unmingled delight. 'Tis only in the pure days of youthful innocence, that this beatific boon can be enjoyed by the crime-cursed sons of earth: for its etherial flame finds elsewhere no vestal altar save in the young unsophisticated heart. How soon, amid the corruption and vices of this wicked world, do these become changed from their truthfulness and constancy!

When we separate, it is with hearts gushing over with tenderness and affection, with one long, thrilling pressure of the hand, with quivering lip and suffused eye, and tongue that can only stammer the inarticulate "good bye." We had fondly and repeatedly and from sincere hearts vowed that time should never tarnish, nor distance sever those firm bright links which years of confidence had welded. But alas for the constancy of man! Business, that heartless despot, on whose blood-dyed altar the human race daily offers its hecatombs of victims, soon

makes even these his abject slaves, and they wear away mind and body in his service. Their fair and ingenuous brows lower and corrugate, their hearts become as dry as ashes beneath the converged Sirius rays of selfishness. They soon ascertain that friendship is a commodity, worth but little in the great bustling mart of traffic in which they drudge. You may sometimes, (although I hope but rarely,) meet such a College companion after a long absence, and how cold is his greeting; how uninviting the glance of his calculating eye; how totally transformed does this Ralph Nickleby of the world appear from the warm-hearted, generous, confiding youth, such as you had formerly known him. It is this change which pierces the tender heart most pungently; to feel, to know that he, upon whom you had expended the wealth of your affections, and who in return you were confident once repaid it, has now suffered other idols to be set up in the room of your displaced image; that he, who vowed eternal love and remembrance, who strained you to his throbbing bosom in an agony of grief, whose bitter tears at parting commingled with yours, over whom though far distant you have thought of by day and dreamed of by night, oh! 'tis a horrid thought that *he* has *forgotten you!* But there are constant hearts, which are only purified by the fiery ordeals through which they pass—are only confirmed and strengthened by the temptations that assail them.

Thus musing alone, I strolled until one by one the lights were extinguished; all except one, and that shed a hazy light around the very room I had formerly occupied. The desire seized me of seeing in what hands it had fallen. Accordingly ascending I proceed along the aisle, when, to my surprise, I see a ghostly figure flit stealthily and noislessly before me, casting back most suspicious glances at me. What can this be? At first a strange sort of a grave yard shudder began to creep chillingly o'er me, inclining "each particular hair" to be independent of its neighbors, as I heard far down that long, dark, viewless passage, a low suppressed whisper, aye, and thought I could even see the saucer eyes and malicious grin of uncouth goblin forms. But sage memory soon repossessed me of my usual courage, causing me to consider that which was alarming me rather as a compliment to my appearance—they had only suspected I might be some one in authority. I approach the door and knock; a strange voice comes forth from within—I enter, but there is no warm and cordial reception from the inmates. With a cold and distant bow, they invite me to be seated on a remnant of the same old chair in which, years ago, I pursued my lucubrations. Every notch, mark or stain, every letter, figure or hieroglyphic carved by my own hand was as familiar to me as my own dear sister's features. And it has

now become proper for these strangers to permit me to use this my old acquaintance—why the idea is as abhorrent to my mind as though I were invited in all kindness by another to kiss my own rosy wife or cuff my own roguish boys. Every thing even here told me in chilling language, I was an utter stranger, forgotten. Stammering a few apologetic incoherencies for my unwelcome intrusion, I enquired after some friend who I knew was far distant, and beat a hasty retreat.

It was with no light heart that I returned to my lodging.

SIGMA.

GRECIAN EDUCATION. NO. VII.

The reader of Plato and Aristotle will easily be convinced that education amongst the Athenians was not only regarded as an exceedingly important matter, but that enlarged views were entertained in regard to it. The system advocated by these eminent men was by no means onesided. The extensive culture of the human powers, both of body and soul, was embraced in their systems. If we regard education as having respect to the body and to the soul of man, and to the latter as consisting of intellectual and moral powers, and classify it under the three-fold head of physical, intellectual, and moral, it may be asserted that no one of these was excluded from the plans of these enlightened scholars and teachers.

What was done in training the body, calling out its energies, and fitting it for energetic and protracted action, is well known. The gymnastics of the Greeks were regarded as exceedingly important, and were made use of with the best effects. In regard to Gymnastic Education, one of the generic divisions of the Platonic system, we have the following account in Professor Smith's History of Education:

"Gymnastics is again divided into two branches: the one for skill in combat, the other in dancing. The former is designed to exercise the neck, the limbs, the hips, with a view to noble carriage, to strength and health; the latter is to give grace, agility, and beauty; so that in the whole body, and in all the motions of the several members, a certain ευρυθμια (harmony) may be expressed. Pure gymnastics ought to render warlike, and should be practised throughout the whole life.

Children should be accustomed, like the Scythians, to use the left hand with the same skill as the right. Boys ought to become strong in the feet as well as in the hands."

The exact sciences, arithmetic, geometry, &c. are embraced in the course. Languages are likewise a part. Logic, economy, and astronomy, are not excluded. Great attention was to be paid to the formation of correct moral habits. Every thing was done that could be, under the circumstances which then existed, duly to instruct the mind, and to call into pure and active exercise its moral powers.

The only material advantage which education now has above what it had then is derived from the christian religion. In other matters it has made very little or no real progress. In some things, it may be regarded as inferior. Physical education is certainly not carried to as much perfection now as it was then. Aesthetical education is not superior to that which produced the fine prose writers and masterly poets of Greece. The intellect is not more powerfully developed than it was in the days of Socrates, Plato, and Aristotle.

Much may, therefore, be learned from these ancient pedagogues, and their precepts enforced, in our days, would be followed by valuable results. *"Every thing should combine to form man, from his youth, to excellence of character, for even as the plant is then most certain to reach perfection, if its first developements are beautiful, so man has indeed his natural distinction as an (tame) animal (ζωον); yet does he most need education, for without it he becomes the wildest animal; but through it he attains his highest destination, and becomes the tamest (most cultivated), yea, the most divine among all creatures. The first food a child can receive is discipline and culture."

Aristotle, particularly in his work on Politics, furnishes us very instructive ideas on the subject of education. Having devoted himself to the education of Alexander, he became prepared both for theoretical and practical agency in the matter. Every one must admit that he discusses the whole subject with his wonted ability, and all must admire the depth and comprehensiveness of his views.

A very satisfactory summary, condensed from the extensive work of Schwartz, has been given in Professor Smith's History of Education. We extract some things from this, referring the reader for more ample details to the work itself:

"In learning arithmetic, the boys were made to distribute apples among themselves, or exchange places, or transpose letters, attempting the possible combinations, first with three, then with four, &c. The units were designated by certain letters, the tens either by accented or compound letters.

In teaching Geometry, the figures were drawn on a board or in the sand, and, according to the ancient method, the pupil was probably left, in a great measure, to independent thought, being required to seek and to find for himself. Instruction in the art of design (γραφικη) was pretty general in the time of Plato; and Aristotle insists on its being practised, in order to cultivate the sense of the beautiful and the artistic judgement.

* Professor Smith's History of Education.

Geography was taught in connection with Geometry. Thales had already made use of geographic tablets (πινακες), on which countries appear to be marked with great accuracy. Of course, the geographical knowledge of the Greeks was limited and defective. Anaximander, (about 570 A. C.) is said to have first described the circumference (περιμετρος) of the earth and sea, to have declared the earth to be speroidal and the central point of the world, and to have constructed a terrestrial globe."

Other interesting facts might be mentioned, but as we design rather to direct the attention to the sources than to exhaust the subject, we will conclude. We sum up by recommending very earnestly the study of the Greek language, which itself is a most extraordinary production of the human mind, embodying thought brought out to an unsurpassed, unequalled extent, expressing every variety of human conception with the richest shades of meaning. No employment can be more profitable to the human intellect than this study, we do not mean the superficial study, but the thorough study of the great masters who have written in this language. We name Homer, Pindar, Aeschylus, Sophocles, Euripides, Aristophanes, Herodotus, Thucydides, Xenophon, Plato, Aristotle, Demosthenes, Aeschines, Lysias, and Isocrates. Let them be studied by day and by night, in youth, manhood, and old age, at home and abroad, and then will we not only know what Grecian Education was and what it produced, but educated ourselves by Grecian mind, we will not found the claim to a blissful immortality on the literary eminence of these men, nor ask in the language of a corrupt christianity, Holy Socrates pray for us; but we will ascribe the best part of our intellectual instruction to these master-minds, and believe that God in his providence made Greece what it was; that it might exert upon all future generations a salutary influence, and contribute largely to his own glory by refining and improving the noble faculties with which he has endowed that noble image of himself, placed at the head of his creation in this world, man.

COLLEGE RECORD.

Linnæan Hall.—The ceremonies connected with the laying of the corner-stone will take place on Thursday the 23d inst. as announced in the last number of the Record and Journal. As we stated some time since that the Hon. Geo. M. Dallas had consented to deliver an oration on the occasion, and as he has since recalled his promise, we deem it proper to mention the fact, lest we should appear to have made a false

impression. We give his communication below, addressed to a number of the committee, which furnishes the explanation.

My Dear Sir,

I find myself forced, by the pressure of imperative and unceasing public engagements, by the clear prospect that these calls will greatly increase between this date and August next, and by a strong consciousness that I shall not be able, while thus absorbed, to do justice to the Linnæan Association, to recall my promise to deliver an address at the ceremony of laying the corner-stone.

As I had promised myself much pleasure from visiting your College, and from a personal though brief intercourse with many of my fellow-citizens whom I have rarely the happiness to meet, this change of purpose is made with reluctance and regret, and would certainly not be made except under circumstances beyond my control. I am, Dear Sir, with great respect,

sincerely your friend and servant,

G. M. DALLAS.

Professor M. L. Stoever. 4th April, 1846.

Although we exceedingly regret the necessity of the Vice President for declining, we are glad that we have been so fortunate as to secure the services of several individuals of distinguished ability, whose high reputation is a sufficient guarantee, that the exercises of the occasion will be of more than ordinary interest. Hon. *Lewis C. Levin*, Professor *S. S. Haldeman*, and Rev. *F. W. Conrad*, are gentlemen that would secure the attention of an audience assembled any where, and that cannot fail to elicit general interest and afford pleasure to all who may favor us with their attendance at the time designated. The Governor of the Commonwealth is also expected to attend and participate in the ceremonies. The position which he occupies, as well as the interest he has always evinced in every thing connected with the progress of education in our State, lead us to suppose that his presence will be hailed with great satisfaction by our citizens, who will be pleased to extend to the Executive the hospitalities of this section of the State.

We again cordially invite all our friends who feel interested in the success of the undertaking and in the welfare of the Institution to unite with us in the celebration. The erection of a Hall by the Linnæan Association for the reception of the increasing and valuable Cabinet is a most praiseworthy enterprise. It will ever be an honor to Pennsylvania College and a lasting monument of the zeal and energy of the students of 1845–6 who projected the undertaking. It will give a fresh impulse to the operations of the Association, and will perhaps rouse the energy of some who are now inactive. We anticipate the exercises of laying the corner-stone of the Hall with peculiar interest, regarding it as an event that will long be remembered, and one which will always form a very pleasing reminiscence in the future history of the College.

MISCELLANEOUS ITEMS.

Sub-marine Telegraph.—The British and French governments have granted permission to two gentlemen to lay down a sub-marine telegraph between the English and French coasts, for the purposes of instantaneous communication between these two countries. The wires have, probably before this time, been insulated and laid down. The soundings, between the points of commencement selected on the two coasts are gradual, being about seven fathoms near each shore, and thirty-seven fathoms in mid-channel. A similar communication is to be formed between Dublin and Holyhead, and another on a gigantic scale is to connect the shores of Europe with those of Africa. No doubt is entertained by scientific men of the practicability of these undertakings. Amidst the wonders which science is developing, and bringing within the power of practical and useful application, who will say that we may not yet see the Eastern continent connected, in a similar manner, with the Western, and consequently intelligence communicated instantaneously over the whole of both hemispheres!

Remarkable case of Mirage.—Until recently a large lake, called Lake Torrens, about thirty miles broad and of undetermined length, was believed to exist in South Australia, New Holland. As the traveller looked down from such lofty eminences as Mount Serle or Mount Hopeless, he supposed he saw before him a large body of water, studded with islands. In 1843, Captain Frome visited the region, and found the lake to be one only in appearance, being a remarkable instance of the phenomenon called *mirage*, so common in sandy and desert countries, and so deceptive to the thirsty traveller. The same region was visited again in 1845, by Mr. Poole, who found it to be a sandy desert, containing only some pools of water, the result or the drainage of the hills.

Salt.—The ocean is the great reservoir into which the atmospheric waters are carried. Whatever is soluble on the surface of the land, is carried thither but is not returned by evaporation. Hence the *saltiness* of sea-water, and hence wherever a part of the year is dry, and the solar evaporation great, large quantities of salt are deposited from small patches of water separated from the great body, either by artificial dykes, as along the Mediterranean, or by sand-banks forming lagoons, as along the coast of Texas, and the Bahamas. Turk's Islands, in the latter region, have long furnished immense quantities to the market, and now it has been discovered that along the coast of Western Texas, whose climate during the summer months is dry, millions of bushels may be procured for the mere trouble of procuring it.

Pennsylvania College, Gettysburg, Pa.

FACULTY AND INSTRUCTORS.

Rev. C. P. Krauth, D. D.—*Pres't and Prof. of Ev. of Christ., Moral Philos'y, &c.*
Rev. H. L. Baugher. A. M.—*Prof. of Greek Language, Rhetoric, &c.*
Rev. M. Jacobs, A. M.—*Prof. of Mathematics. Chemistry and Mechanical Philos.*
Rev. W. M. Reynolds, A. M.—*Prof. of Latin, Mental Philosophy, &c.*
M. L. Stoever. A. M.—*Prof. of History and Principal of Preparatory Department.*
Rev. Chas. A. Hay, A. M.—*Prof. of German Language and Literature.*
Herman Haupt, A. M.—*Professor of Mathematics.*
David Gilbert, M. D.—*Lecturer on Anatomy and Physiology.*
Rev. J. G. Morris, D. D.—*Lecturer on Zoology.*
Mr. W. A. Renshaw.—*Tutor.*
Mr. A. Essick.—*Tutor and Teacher of Writing.*

Pennsylvania College has now been chartered about fourteen years. During this time its progress has been such as to gratify the most sanguine expectations of its friends. The course of studies is as extensive and substantial as that of any Institution in the Country. The *Preparatory Department* provides for instruction in all the branches of a thorough English, business education, in addition to the elements of the Mathematics and Classical Literature. The *College Course* is arranged in the four classes usual in the Institutions of this country.

The government of the students is as energetic as their circumstances seem to require. They attend at least two recitations a day, Church and Bible Class on the Sabbath, and are visited in their rooms so frequently as to preclude the danger of any great irregularities. It is believed no Institution in the United States has more exemplary young men in connexion with it. They are all required to lodge in the College Edifice, special cases excepted.

The annual expenses are—for board, tuition and room-rent, during the winter session, $61 87½; for the summer session, $41 87½. Washing, $10 00; and Wood, $3 00. Total expense, $116 75. Boarding can be obtained in town at $1 25 per week.

There are two vacations in the year, commencing on the third Thursdays of April and September, each of five weeks continuance.

Acknowledgements of Donations to the Cabinet of the Linnæan Association of Pennsylvania College.

June, 1846. From *Mr. Sam'l Wampler*, a live bull-snake six feet in length, caught upon the grand prairie of Illinois, Jacob Streamer.

2. From *Mrs. Mary Hartley*, Va. minerals.
3. " *Miss Ellen Hartley*, " do.
4. " *Matthew Miller*, 1 coin.

Receipts during June.

Peter C. Keller, Philadelphia. Pa.	in full.	
Geo. E. Cooper, "	"	
Rev. J. R. Keiser. New Germantown, N.J.	" 2d Vol. *	
Gilliard Dock, Harrisburg, Pa.	"	
Rev. A. Weiting. Middletown, Pa.	"	
J. R. Duflield, Gettysburg,	"	
G. Henry Snyder, "	"	
Jacob Heck, "	"	

* The payment for the 1st Vol. made to Dr. Kurtz, not received by us.

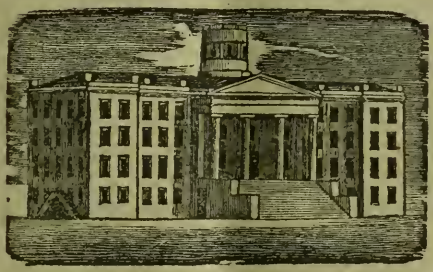
VOLUME II.] [NUMBER 10.

THE

LITERARY RECORD AND JOURNAL

Of the Linnæan Association of Pennsylvania College.

AUGUST, 1846.



CONDUCTED

By a Committee of the Association.

CONTENTS.

1½ sheet, periodical—Postage, 2½ cents, to any distance within the Union.

NEINSTEDT, PRINTER, GETTYSBURG.

THE LITERARY

RECORD AND JOURNAL

OF THE LINNÆAN ASSOCIATION OF PENNSYLVANIA COLLEGE.

VOL. II. AUGUST, 1846. No. 10.

PHILOSOPHY OF STORMS.

BY PROF. WASHINGTON L. ATLEE, M. D. PHILADELPHIA, PA.

DEAR SIR: In the Summer of 1839, Professor Espy visited Lancaster, Pa., by invitation, for the purpose of explaining to a class his views upon the laws of storms. Great interest was excited in the subject by the lecturer among the few who formed his audience. Those who had previously been acquainted with the principles upon which his theory was based, easily comprehended the truthfulness and beauty of their application to these meteorological phenomena. While others, more ignorant of science—yet presumed by the lecturer to be well-informed—could not clearly understand the details of his theory. The condition of the latter, however, was far better than that of the out-door community, who had been led by many of the newspapers to look upon the "Storm King" with little else than ridicule.

Under these circumstances a few of Mr. Espy's friends requested me to draw up a popular account of his theory for one of our papers, which, with his approbation, I consented to do: and having taken notes of the leading points of his lectures, I made these the ground-work of the several communications which follow. Two years after their publication Mr. Espy issued his work on the Philosophy of Storms. Whatever errors, therefore, may have been promulgated, in the first edition of these essays, can now be corrected by my referring to Prof. Espy's book while issuing this second edition.

If, therefore, the character of the subject be consistent with the object of your Journal, and the style of the communications be not too familiar for the taste of its readers, I will revise them for your pages.* In order to avoid explanations hereafter, I would premise that they were originally written and published in Lancaster, and that I shall, for certain reasons, retain that locality in the body of the essays. This will account for the apparent discrepancy of issuing them from Philadelphia, the place of my present residence.

* We doubt not our readers will be highly gratified to learn that the present number is to be the *first* of a *series* of articles, by Professor ATLEE, upon a subject embracing so much that is interesting and practically useful. The Record and Journal will, we expect, during every successive month for a year to come, contain one of these articles.—ED.

NUMBER I.

In order to make the general mass of our community acquainted with Mr. Espy's theory, as explained by himself in two lectures delivered recently in our city, I propose to furnish a weekly communication, until I have gone through with the information contained in those lectures. In the course of my observations it may be possible that I may misinterpret Mr. Espy, although I shall endeavor to confine myself wholly to those matters which I think I fully understand, interspersing them, however, with such remarks and explanations as will bring the subject down to the comprehension of all.

Ever since the discovery of the barometer it has been known to *stand low in the midst of storms*, and lower in proportion to their magnitude. The barometer is nothing more than a glass tube, usually about thirty-six inches long, hermetrically sealed at one end, then filled with quicksilver, and its other open end inverted and immersed into a small basin of the same metal in a perpendicular position. There is, therefore, a column of mercury within the tube communicating with a body of mercury outside the tube, whose immersed end must be carefully retained below the level of the surface so as to prevent the ingress of air to its interior: just as in a common pump-stock in a well of water. This little instrument is employed to determine the weight of the atmosphere, and acts in the following manner: a column of atmospheric air, whose ordinary height is supposed to be about forty-five miles presses upon the surface of the metal in the basin outside the tube, and counteracts the pressure of the column of quicksilver within the inverted tube, and prevents it from running out into the basin; so that the barometer acts precisely on the principle of the common balance.—When the atmosphere is heaviest the column of mercury in the tube is highest, and *vice versa*, its height being in exact proportion with the weight of the superincumbent air. Now it has been ascertained by experiment that at the level of the sea the pressure of the atmosphere is capable of supporting a column of mercury of one inch square and thirty inches high, and that this amount of mercury weighs fifteen pounds. Hence a column of air, at this level, one inch square and extending to the extreme limit of the atmosphere, must also weigh fifteen pounds. The barometer, however, does not always stand at thirty inches, sometimes being higher, sometimes lower, indicating thus a variation in the pressure of the atmosphere. Every inch of variation of the instrument is equivalent to half a pound in weight in the pressure of the air on every inch of surface. The average height of the barom-

eter in this latitude is twenty-nine and a half inches, and its average fall and rise, or range, is nearly nine-tenths of an inch.

The sinking of the barometer during the existence of a storm was difficult to understand upon the old principles of meteorology, and indeed it could not be satisfactorily explained until Mr. Espy engaged in the study of this science. Clouds were commonly believed to be heavier than the air, and, therefore, it was considered an anomaly for the barometer to sink beneath a cloud, although the fact of its sinking was long and well established.

The action of the barometer has a very important connexion with Mr. Espy's theory, and it will be necessary to bear it always in mind in applying this instrument to the elucidation of his views. If the height of the mercury depends upon the pressure of the atmosphere, it follows that the weight of the latter must be least where the former stands lowest, and that the resistance of the air must exactly correspond with its weight. *The air must, therefore, be pressed inward on all sides towards the space where the barometer stands lowest*, and, of course, if it stands lower in the midst of a storm than it does all around its borders, the air must always rush inwards towards the centre of a storm. Here, however, a difficulty presents itself to the mind. If the air rushes in towards the centre of a storm, the barometer, instead of sinking, ought to rise above the mean by this concussion and seeming accumulation. Hence some have hastily inferred, that because the barometer continues to sink, the wind cannot blow in towards the centre of a storm. Were this difficulty insurmountable it would be fatal to Mr. Espy's theory. I shall, however, explain it in my next number. In the mean time it is desired that every principle and fact laid down in this and future communications will be accurately recollected while developing this all important and curious subject.

AGRICULTURAL EDUCATION.

Extract of a communication from an officer of the Agricultural Institute of Walden, N. Y., to one of the Editing Committee.

My Dear Sir: I embrace the earliest opportunity, after my return home, to open the correspondence which I promised, at our recent interview in Philadelphia.

I felt highly gratified with the interest you manifested in the topic of agricultural education, by an inquiry for information upon the subject, and still more so that you solicited such information and views as

I may possess. These I will cheerfully contribute, in the hope that they may conduce to the advantage of your College, our Institute, and the agricultural interests of our common country.

I sincerely regret that I have not been able, at any period, to obtain an expression of my own views in a connected form from any other pen, or even any distinct and connected view of the subject. All that has fallen under my notice has been of a desultory character, without any directly practical bearing, and generally only a view from some particular direction.

Prof. Fanning of the Franklin College of Tennessee about three or four years since introduced the practice of agriculture as a part of education, at Elm Crag school, which was afterwards incorporated by the Tennessee legislature as Franklin College. In this college there is still attention paid to the practice of agriculture, upon a farm connected with the institution. So far as I can gather from the "Agriculturist," a paper edited by the officers of the college, the chief design of this department is the physical training of students, without reference to their ulterior pursuits in life. The College is, I believe, connected with the Methodist denomination: and the connection of artistical employment with classical and other studies has there some features indicating its parentage in the union of secular calling with the ministerial office. The grand and direct design of the agricultural department is not to train and educate farmers for their business as citizens and farmers.

In Holland and upon the continent of Europe, particularly in Germany and Prussia, there has been an agricultural department attached to their Universities. I must confess my knowledge of its duties and objects as imperfect, and destitute of that precision which is satisfactory. From what little information I possess, I have formed the opinion, that the department was charged with the investigation and exposition of the mere theory of agriculture as a portion of the great system of knowledge. The recent developements of chemical science have given those occupying the agricultural chair a more direct bearing upon practical agriculture than they before exercised.

The Institution at Hoffenwhyle classed that of agriculture among other industrial occupations. Fellenberg embraced in his scheme the wide field, and prepared his pupils for various pursuits according to their selections. Among these the farmer occupied a prominent place. The student studied here the theory and acquired the manipulation; I have no evidence that he obtained a knowledge of the domestic economy of the farm,—that which makes it profitable. He may have learned to plough and sow and gather his wheat, and all the sciences con-

nected therewith; but still be ignorant of the profitable arrangement of his land, the suitable grains and their varieties and succession on his farm, and those general principles, which are to govern his judgement and practice, under the thousand and one circumstances to which he will be subjected. I have not yet met with any great agricultural advancement as the result of Fellenberg's plan. It was defective in that item of knowledge and skill, which forms the experience and judgment which leads on to profitable farming.

During the month of March last, an announcement appeared in the public prints, that a Farm-school would be opened upon the farm of General Harmon, in the western part of this state. About the same time, Mr. John Wilkinson, of Dutchess county, of this state, announced that he would open a school upon his farm consisting of two hundred and twenty acres of land. These schools have for their design, as announced, the instruction of young gentlemen in practical and scientific agriculture. About the same time G. G. Howland, a merchant in New York City, owner of a large and very highly cultivated farm on Long Island, offered that farm to the American Agricultural Association, rent free, for the establishment of an agricultural school and experimental farm. The offer was entrusted to a committee whose report I have not seen, if one has been made. These schools seem deficient in the same point in which I had viewed Fellenberg's.

At about the same time with the above, our announcement was issued. The plan was intended to meet the defect of Fellenberg's school, and to have no *other design* than to educate farmers for farming, as physicians are educated physicians, and members of other professions and employments for those professions and employments. The plan was the subject of study about eighteen months before it assumed shape and form. We now think it is calculated to accomplish the design in view, viz. a full English education connected with the theory, economy and practice of agriculture.

I have now, in as concise a manner as practicable, presented the present condition and facilities for agricultural education. Our Institute stands alone in its place. It is yet an experiment. We augur success; but if it fail, we feel that it will only be because of our insufficiency, and not from any inherent defect in the scheme. I must confess when I look upon the great mass of facts to be gathered, the principles to be applied, through the wide range of science, all touching at some point upon agriculture, I am constrained to cry out, Who is sufficient? I am not. When I remember, that one thing at a time is all which is required, hope revives and courage is excited to persevere.

Agricultural education divides itself into two branches: 1st the practice, 2nd the science.

The practice has a similar division as to number: 1st the manipulation, 2nd the economy.

Albert D. Thaer makes a three-fold division: 1st an occupation, 2nd an art, 3d a science. I prefer the view I have given, chiefly because it forms the proper basis for a scheme of instruction. The manipulation includes all handicraft practised in preparing, enclosing land, putting in seed, cultivating the growing plant, gathering the harvest, securing and separating the grain and hay, management of teams, dairy, store stock, &c. This division does not need much explanation; the meaning of manipulation is fully understood. Skill in it can only be acquired by practice. This branch of agriculture is old, even coeval with agriculture itself. Even the farmer on the banks of the Nile, though he does not plough, requires some skill in manipulation. Its advance from the rudeness of the earliest ages has been dependant upon experience, or the influence of mechanical science in other artistical occupations. This part of farming is much ameliorated by improvements in machinery and implements. In fact it is that branch alone, which connects it with mechanics, and may probably be almost superceded by machinery, as the inventive genius of our people is advanced, and the true combinations of mechanical powers and laws understood which are combined and used by animated power, in each step of a manual operation, and the varied obstacles to be overcome. Mind, to provide expedients in unanticipated difficulties combined with skill in manipulation, produces the wonders of art. This mind and skill have been thrown into inanimate machinery, so that the result is obtained without any new exertion of mind, or application of skill. The child now a-days accomplishes the work of many men a few years since, and improves thereon. The manipulations of agriculture are subjects of almost infinite improvement. The progress of that improvement can scarcely be conjectured, either in its rapidity or extent, when skill in practice is combined with truthful and pure science, regulated by pure motive, in the multitude of strong and active and energetic minds in our land among farmers.

DINOTHERIUM.

Bones of this extinct genus have been found near Orthes at the foot of the Pyrenees, and at Epplesheim in the province of Hesse Darmstadt, both in Tertiary strata. From the form of the molar teeth Cuvier was induced to refer them to a gigantic species of the Tapir, but Professor

Kaup gives the animal an intermediate place between the Tapir and the Mastodon, forming a new link in the family of Pachydermata.

The Dinotherium differs from every other animal in several remarkable particulars, forming the distinguishing characteristics of the genus. It is supplied with two enormous tusks, and what is very remarkable these tusks which are nearly six inches in diameter at the maximillary extremity, are not attached to the upper but to the lower jaw of the Walrus. The lower jaw is four feet long, and the whole length of the animal, according to Cuvier, could not have been less than eighteen feet.

In the Western states, bones have been found which bear a great analogy to those described by Cuvier and Kaup, and are supposed to belong to an extinct animal of the same genus; they were discovered near Evansville, Ia., and from an account published by Dr. Casselberry we obtain the following facts:

The fossil bones are found in alluvion of a particular character, consisting of sand, clay, logs, decayed leaves, fresh water shells, with an occasional boulder of red sandstone, a blue carbonate of lime. Some of the logs are in such perfect preservation that the particular species of trees to which they belonged can be easily recognized; among them are found the white and black oaks which with many other species grow luxuriantly on the banks of Ohio. The leaves are very brittle, but the forms of many can be readily distinguished, and the species ascertained. The shells are much more abundant in the immediate neighborhood of the fossil bones than in any other part of the deposit. The pelvic bone, the phalanges and others, were when found, covered with a ferruginous and testaceous deposit, consisting of small shells connected with oxide of iron. This deposit was of considerable strength, and required great care in its removal, as the bones were very brittle and became more so by exposure to the atmosphere.

The position in which the different bones were found renders it very probable that the skeleton was deposited entire, since the whole space which they occupy does not greatly exceed the probable length of the animal, whereas had they been brought from a distance in a disjointed state by currents of water, the fragments would probably have been much more widely separated. This single fact, however, is not sufficient to prove that the animal was contemporaneous with the formation of the alluvion, particularly as similar remains in other parts of the world have been found only in the tertiary deposits. The bones which have been found were washed out by the current of the river, and it is possible that many of the smaller ones may have been removed by the

water and become lost, others may yet be discovered by continuing the excavations in the bank during a period of low water.

The few bones that have been found are however sufficient to furnish reasonable grounds for the opinion that the animal to which they belonged was the Dinotherium Magnum.

The pelvic bone is of immense size, its general conformation differs from that of any other pelvic bone described by comparative anatomists, and is sufficient to prove that it did not belong either to the Mastodon or the Megatherium, to both of which it bears some analogy. The pelvis of the Megatherium is of great solidity and the immense bones of the ilium are set nearly at right angles to the vertebra. The fossil ilium, judging from its size and general configuration, could not have sustained this position to the vertebra, for in this case the acetabula instead of being on the under part of the pelvis, as they evidently were, would have been upon its side in a position the most unfavorable for strength and facility of locomotion. The position of the acetabulum is also sufficient to indicate that the animal was not a Mammoth or a Mastodon, for in both of these the cavity for the articulation of the former is situated on the side of the pelvis, as in the horse, and not beneath as in the Megatherium and Dinotherium.

The phalanges or bones of the toes were found near the pelvic bone, to the magnitude of which their sizes are proportioned: those found appear to have belonged to the same foot.

Without entering into any details in reference to the configuration of these bones, it is sufficient to state that their general appearance indicates that the foot was designed for digging in the earth.

Several pieces of the tusk were also found which from the general appearance of the fragments must have been very much curved.

From all the facts of the case it appears that the fossil bones belong to the Dinotherium Magnum, an animal whose remains have never before been found in alluvial formation.

The concluding remarks of Dr. Casselberry are as follows:

"The lower jaw of the Dinotherium is nearly four feet long, loaded with heavy tusks at its extremity. This structure would have been cumbrous and inconvenient to an animal living on dry land. No such disadvantages would have attended this structure in a large animal destined to live in water: and the aquatic habits of the family of Tapirs, to which the Dinotherium was most nearly allied, render it probable that, like them, it was an inhabitant of fresh water lakes and rivers. To an animal of such habits the weight of the tusks sustained in water, would have been no source of inconvenience. The tusks of the Dinotherium

may also have been applied with mechanical advantage to hook the head of the animal to the bank, with the nostrils sustained above the water so as to breathe securely during sleep, while the body remained at perfect ease beneath the surface; the animal might thus repose, moored to the margin of a lake or river, without the slightest muscular exertion, the weight of the head and body tending to fix and keep the tusks fast enclosed in the substance of the bank, as the weight of the body of a sleeping bird keeps the claws clasped firmly around the perch. In all the characters of a gigantic herbiverous, aquatic quadruped, we recognize in the Dinotherium adaptations to the lacustrine conditions of the earth during that portion of the tertiary periods, to which the existence of this seemingly anomalous creature appears to have been chiefly limited. But the mind of the beholder is struck with awe when it realizes the certainty, that so gigantic an animal as the Dinotherium Magnum must have sustained an existence at so recent a period as the alluvial formation.

The valley of the Mississippi abounds in evidence of the existence of many gigantic extinct fossil animals; but so far as we have learned, this is the first one of the kind that any fortunate observer has been able to find."

GERMAN PHILOSOPHY.

THE DOCTRINES OF KANT, FICHTE, SCHELLING AND HEGEL

By C. De Remusat, Member of the Institute of France.

(Continued from page 199.)

Such, in a summary way, is the doctrine of Kant. It has incurred and appears to merit the double reproach of idealism and scepticism. It is in effect a principle of idealism which reduces to a subjective verity the representations, the notions and ideas of the human mind. It is a sceptical view that supposes as problematic the conceptions of the reason relative to the highest and most interesting questions, or at least regards those questions as susceptible of contradictory solutions.

It is worth while, however, to remark that neither the scepticism nor the idealism is here absolute.

Observe in the first place what is admitted as unquestionable: 1. Empirical impressions, what Kant calls experience, and which cannot be less than the direct appearance of internal phenomena, indirect of external phenomena, independently of the will. 2. The me of the consciousness, or at least the consciousness of the me, *cogito*. 3. The principles of logic. 4. The subjective necessity of the pure laws of

thought considered in the sensibility, the understanding, and the reason. 5. The certainty of a free will, absolute certainty, as there is there nothing external, or properly objective, and consequently an objective certainty is there an absolute certainty. 6. The absolute authority of the law of duty for the same reasons. 7. The practical verity of all the principles which are as the conditions or necessary consequences of the practical reason, that is to say, which are as the logical complement of the unity of the free will and of the moral law in the reason of a true me, (d'un même moi).

The truths thus brought out are not all; Kant did not regard all human knowledge as a fiction. Not only is it real in itself, not only is it necessary in one part of its totality, not only is it certain in all that which it contains as necessary to the practical reason, but it is moreover a subjective reality. Is subjective reality conformed to objective reality? In other words, is it truth? This is neither demonstrable nor necessary. Reason cannot demonstrate itself, and the necessity relates to the reason. It cannot be said that our cognitions *are* illusions; but they *may be* illusions. The faith of reason in cognition or in itself exists in fact, but not of right. That which is ordinarily called human reason is a logic of appearances.

Kantianism then lacks absolute faith in reason; this, according to my view, is a gap and an inconsequence in the criticism.

A gap—for a critical analysis carried further forward, more vigorous and more complete would have established in the subjective the objective itself, or, to speak more correctly, the absolute in the relative. Reason is conformed to truth, or it is not reason; cognition gives the truth, or it knows nothing. It is in fact an *a priori* law of thought and the most universal of all, not that things are thought as they are thought, but that they are thought as they are. The analysis of Kant has not been that *exact review* which Descartes recommended, and which should suffer no fact to escape unobserved.

An inconsequence. For the cognition of oneself, which is there given as true, is an absolute cognition. That which we know of ourselves is as we know it. The *criticism of the pure reason* has established this. Inasmuch as the subjective exists, the reason, which knows it, knows the truth in so far as it knows this truth. But the distinction of the subjective supposes the objective. In fact an objective reality of some sort was not denied by Kant, he admits it, he even demonstrates it in part. But to know this is to know objectively. If then Kant denied the legitimacy of objective knowledge, he contradicted himself. The truth is, he did not deny, but limited it.

Kantianism, then, is not exactly either idealism or scepticism. What we can say is that Kant yielded many points; he did their work very well for them. His doctrine is eminently a rationalism with a tendency to idealism and a risk of scepticism, through the idea of universal subjectivity. But the idea of universal subjectivity is not of itself necessarily exclusive. Universal subjectivity could be true in the sense that everything is subjective, that is, that everything is thought of, even the absolutely unknown, under the general form of the possible; but from the fact that in that sense everything is subjective, it would by no means follow that the subjective was everything; for in the subjective we find the objective, for example, the unconsciousness of the origin of experience; this is a point that Kant received as his starting point. In no place does he appear to suppose that experience, that is to say, the first movement of the sensibility, can be an act that exists of itself, the primitive act of a spontaniety which is its own proper principle—we do not perceive that which makes us to perceive. Thence he inferred that the pre-eminence of the subjective over the objective arises from the experimental and logical belief, that there is immediate consciousness of the one and not of the other, and that we necessarily proceed from the one to get to the other, since we are the one and not the other. The subjective me is itself something, consequently it exists objectively and the subjective is an objective. There is consciousness of an absolute reality; for the consciousness is not nothing.

If universal subjectivity were an absolute, exclusive principle in science, there would result two consequences.

The first would be, the impossibility of error. Error is not an illusion, or at least it is not an avoidable and recognisable illusion. But, if the representations of the me are nothing but the actual application of the necessary laws of thought, they are just as they are in themselves; they should not be submitted to any possible control. The objective being to the reason as if it were not at all, cognitions could not be traced back to it, and experience would be uninstructive. Error would then be only in the subjective; but evidently it is not in those laws and in those forms which are by their very necessity invariable. Is it in the given contingents of thought? But the contingent is composed of the brute matter of the intuitions, which is given fatally, and is not within the province of the reason. Not being in the necessary, nor in the contingent, error should then be in the union, in the application of the necessary to the contingent, of the pure thought to experimental data; but how, according to what rule, after what type are we to judge of the validity, of the regularity of that application? That which comes from

experience is fatal, that which comes from the pure reason is necessary How between a fatal contingency and a necessary subjectivity is error possible? On the one side, what is the ground, what is the substance of it; on the other, what is the principle that could perceive and establish it? On what shall we base any judgment to recognise error and to correct it, if there is not within us an absolute principle superior to us and which judges with authority of the subjective itself, that is to say, an objective reason, absolute in itself, relative by its situation, or as it has ever been said, a participation of the primitive and universal reason?

A second consequence would be, that the doctrine of universal subjectivity would render doubt impossible. Whence could it proceed? What is the pure form, what is the category of the understanding that could engender doubt? All notions *a priori* are necessary. Necessary in themselves, why should they not be so in their application? And why, consequently, do they not imperiously force conviction? They could admit doubt but upon a single condition, that of the existence of a faculty, a superior power which, in virtue of a right which it feels, or rather of a law which does not resolve itself into any category, into any notion, disposes of both notions and categories; of a clear-seeing principle which chooses them according to the cases in order to determine them in each case by a particular application, which employs them freely, not in the sense that it makes an arbitrary use of them, but in the sense that it finds only in itself the law of that determination, a law implied and without a formula and which is as the very nature of the reason. But undoubtedly the reason which thus judges could not but judge as it does judge; it knows that it should judge well, and that it is constituted for that purpose. It does not make the truth; it recognises it; but it knows and perceives at the same time that it is not infallible; yet it has not always an immediate intuition of truth, that is, it does not arrange with an instantaneous certainty the notions and the faculties that are under its orders. Is it *a priori*, is it by experience that it knows itself to be thus limited thus imperfect? That curious question is here of no importance; it is sufficient that it has been shown that doubt is impossible to the subjective reason of Kant, and supposes an absolute reason without which all intelligence such as he describes, would be a dead letter, or rather a thing inert or disorganised.

This is still more true of methodical doubt, of prudent and curious doubt which precedes the accurate acquisition of science. In general doubt supposes an objective, an absolute. There is nothing in the subjective by which to judge of the subjective There is wanting to the

pure reason of Kant, if it is not to certain point the absolute reason, the possibility of perceiving that of which it is ignorant, of questioning that which it imagines, knows, or thinks. But, in fact, nothing is more certain than that quality; philosophy, among other things, is impossible upon any other terms, and the *Criticism of the pure reason* is one of the most memorable monuments of the reason judging the human thought, and deciding with an authority represented by the author himself as demonstrative, the part of the subjective and of the objective, that is, establishing absolute truth. *The criticism of pure reason*, what is the meaning of this title? A criticism supposes a critic, a judge of the pure reason. That title, in truth, signifies the absolute reason judging the human reason.

But, some one may say, that the one does not differ from the other; it is always either the human reason that judges or the absolute reason that is judged. I admit it; but the critical reason, or in a single word the criticism of Kant, in so far as it criticises or judges the pure reason, is distinguished from this, although it cannot be separated from it. It takes it for the objective in so far as it is the object of observation, that is, of experience,; it gives there by the consciousness a certain intuition, and in judging it, submits it to a certain law, it refers it to a type which it finds in itself, and which it imposes upon it, that is to say, to an absolute. Did Kant assert that it is subjective in both cases? He does not indeed assert it, and it is true that it is always the human reason; but in so far as it judges, it is taken otherwise than when it is judged, and those two words *criticism* and *pure reason*, although designating in the last analysis the same subject, are in reality two points of view, two sides, two situations, in the language of Hegel, two moments, and the words translated and read in that proposition, *philosophy judges the human mind*, must not be a useless tautology.

Thus there is no room for the existence of error and of doubt in the human mind of Kant; and, in fact, I do not recollect that the reason of error is given anywhere in his works, or even that the possibility of false or of true judgment, of false or true ideas is anywhere well explained by him. This omission would be natural in a system condemned by its principles to suppose the possible falsity or illusion of all our judgments, of all our ideas, even of necessary ones. Apparently doubt is there nowhere presented as one of the consequences, even possible, of the nature of the faculties of the me, and this omission is equally explicable in a system that makes all notions necessary in the subject that conceives them

Remark, in passing, an important point to which I shall elsewhere

revert. We have no consciousness of that which is deficient in our cognitions. The deficiency of our ideas is, in fact, to us a thing that does not exist. This negative of cognition, by the very supposition, never makes its appearance. It is therefore very difficult to explain how we perceive it; and by Kant's system it is impossible. In general, I do not know what Kant would say if it were to be shown him that he has no consciousness at all of the subjective, or to speak more correctly, that the subject has no consciousness of all that it knows itself to be.

These objections affect the basis of the critical psychology. We observe again, that that psychology is neither scepticism nor idealism properly so called, although it has, in some points, deferred to the sceptical objection, or accepted of idealistic distinctions. But it is a rationalism throughout; it is a reason observed by the reason. Descartes and Leibnitz both professed a true rationalism. Since Kant, I know of no rationalism that has not seized upon the criticism, that has not adopted its principles, except in their negative aspects; but I still look for some one to complete the criticism, to fill up the voids, and to bring forth a rational dogmatism. In the present state of human knowledge, a dogmatical philosophy growing out of the critical philosophy appears to me the ideal of philosophy.

Our observations hitherto have touched only upon the *Criticism of the pure reason.* But this is not all of Kantianism, although it determines and characterises it. Complete it by the other works of Kant; erect the whole by the combination of its parts, into a system of philosophy, and you will meet with invincible difficulties. A common bond is wanting to all the parts of the science; for none of its parts will be a science upon the same conditions. Thus morality is obligatory for the practical reason, or rather the practical reason is not reason except in so far as it judges and directs our sentiments and voluntary acts, in that aspect moral notions are necessary to it; in other words, it cannot avoid thinking that evil is evil, and that good is good, and that we ought to act conformably to this distinction. But this necessity is absolutely of the same kind as that which rests upon the pure reason. The practical reason and the pure reason are only one and the same reason, viz. which is equally obliged under those two names to believe and to think according to its own proper authority. Whence comes it then that the *Criticism of the pure reason* is given as an hypothesis and that of *the practical reason* is a certainty? To the two former criticisms succeeds a *Criticism of judgment* in which the ideas of the *Criticism of the pure reason* are hypothetically taken as true. Thus in the first work the science reduces itself to that of a necessary hypothesis; in the sec-

ond it is applied to an absolute verity; in the third it supports itself by the hypotheses of the first taken as absolute verities. In a science thus dismembered I cannot recognise philosophy. Upon conditions so different, there would cease to be any science. The critical doctrine would then come to the aid of those empirical, mystical and skeptical doctrines which mutually conspire against the truth of philosophy.

Thus the doctrine of Kant which presents a great unity in its method is ultimately neither one nor complete. The three criticisms, which are the essential elements, do not form a systematic whole. The *Criticism of the practical reason* is not contained in that of *the pure reason.* It fills up its gaps, and if it is not precisely its refutation, it is opposed to it in the sense that it restores what the other has suppressed, and remakes what the other has unmade. It contradicts it in attributing to a certain subjective knowledge an authority to the destruction of which the first criticism was in general consecrated. As to the *Criticism of the judgment*, it was not at all announced by the other two, it is not necessarily derived from them; it fills up a void, it repairs an omission; but it is by no means united with what has preceded, and one does not exactly know whether it gives a subjective or an objective knowledge, for we do not find in it either the practical authority of morality, or the transcendental abstraction of critical psychology. From these three great works results a doctrine inconsistent and still incomplete, omitting whole sciences which belong to philosophy. Kant undoubtedly returned to these in other works. He has thrown out upon all questions ingenious or profound views, but these do not always rest upon the grounds of his doctrine. Far from gaining by being attached to it, they there lose in authority, for they are there nothing but the gratuitous and hypothetical sports of a reason deprived of the intuition of everything that is not itself. We might then say, if such an expression had not the impertinent appearance of paradox, that the doctrine of Kant does not constitute a philosophy, understood in the sense of a system of the nature of things. It is a powerful psychological method, a profoundly original criticism of science, an introduction henceforth necessary to all philosophy, an admirable system morality also, and in fine a rich collection of fragments full of spirit upon all the problems of philosophy.

COLUMBA,

THE UNWONT WORSHIPPER

BY DELTA.

Amid a green and solemn wood,
  Where woodbine twined, in grace,
A quiet, modest temple stood,
  And holy seemed the place:
For pious men had gathered there—
  Matron, and gentle maid,
To bow in hushed and fervent prayer,
  To him, whose love hath made
Earth, with its beauty, and its light,
And heaven, with its far glories bright!

And o'er that crowd, which gathered then
  Came stilless, calm and sweet,
And thoughtless youth, and reverend men
  Bowed low at Jesus' feet
As sunlight shed a mellow sheen,
  And gladness steeped each soul,
Behold! a snow-white Dove is seen,
  And gently in it stole,
Gliding on calm and beauteous wing,
'Mong the meek throng there worshiping!

O gently perched, in holy trust,
  That fearful, trembling bird
Above that gathering of the just,
  And sat, as though it heard
The warblings of the upper choir,
  While meek the humble sang
In notes that kindling joy inspire.
  As through the church, they rang,
Its glossy neck it gently bent,
To catch the tones, so sweetly blent!

Emblem of peace and hope it seemed!
  That unwont visitant!
A seraph light its soft eyes gleamed
  O'er saint and supplicant!
And, a heavenly type, it stirred,
  In each hushed reverent breast,
Remembrance of that cherished bird,
  That smoothed the flood to rest,
And yet a holier seal it brought,
With Love, and Grace, and Mercy fraught!

SIBERIA. NO IV.

An important inquiry here presents itself: What induced man to establish himself in this dismal region? The animals either visit or inhabit these icy wastes in obedience to the laws of unerring instinct. Wandering tribes, visiting more fruitful lands and genial climates, are induced to forget their former homes and form new settlements. But what inducements are here to attract or secure the affections of rational beings? Here life is a ceaseless conflict for existence with the terrors of cold and hunger. Here is the grave of nature, with the melancholy remains of a former world. Little can be gathered from the natives, and the question will probably remain unanswered. Without attempting a reply, I pass on to a few reflections concerning the natives.

Before the conquest of Siberia by the Russians, the population was every where greater than at present. Some numerous tribes have left only their names behind, and yet there remain, on a comparatively small surface, eight or ten distinct races; some consisting only of a few families, but all distinguishable from each other by language, customs, and features. They appear to be fragments of more numerous tribes, some of them having come perhaps from a great distance. The most important of these tribes are the Jakuti, Tschuwanzi, Tungusi, Omoki, and Tschuktschi. Some of these tribes are divided, one part nomadic in their habits and employing the tame rein-deer as a beast of burden, and the other fixed employing the dog. The former were invariably found to be larger and more vigorous. The Omoki, who were settled fishermen, and the Schelagi, who were nomadic, have so wholly disappeared from wars with intruders, and from devastating sickness, that their names are now scarcely remembered. The Jakuti alone have not only maintained their numbers, but have advanced very considerably in population, and in the cultivation of the soil. This of course refers to the Southern part of Siberia. They have the merit of introducing the rearing of cattle and horses and other branches of industry, where the soil, and still more the climate seemed to forbid all such attempts. Their countenance, tradition, and mode of living, all indicate their Tartar origin. They eat horse-flesh and drink *kumys*, (a beverage prepared from mare's milk,) and migrate in the spring to leave the pastures near their winter dwellings undisturbed. They are exceeding litigious and unsocial in their dispositions, and so vindictive that feuds unsettled by the father are handed down to the son.

They were heathens and idolaters in religion, but, through the labors of priests of the Greek Church, have received that form of christianity which is established in the Russian empire. In connexion with other

tribes, they yet adhere to *Schamanism* and other superstitions of heathenism. The Schamans, from whom Schamanism has its name, are in general a set of juglers, who go about through the tribe exhibiting all kinds of tricks in order to obtain presents. The history of not a few is, it is said, very different. Certain individuals are born with excitable nerves, and an ardent imagination. They grow up amid the general belief of ghosts, and the mysterious power exercised by the Schamans. The credulous youth is strongly affected, and aspires also to participate in supernatural power. He therefore retires from his companions into solitude, and, by the contemplation of the gloomy aspect of all around him, his imagination is powerfully affected. He makes long vigils, fasts, and uses strong narcotics and stimulants, until he is persuaded that he also has seen the mysterious apparitions, of which he has heard from boy-hood. He is then received as a Schaman, with many ceremonies, in the silence and darkness of night, and the magic drum and other emblems of his order are given him. A true Schaman, therefore, is not a cool, calculating deceiver, but a psycological phenomenon every way worthy of attention. Always after seeing them operate, says an eye-witness, they have left upon my mind a long-continued and gloomy impression. The wild look, blood-shot eyes, the laboring breast, the convulsive utterance, the seemingly involuntary distortion of the face and whole body, the streaming hair, the hollow sound of the drum, all conspired to produce the effect; and I can well conceive that these should appear to the superstitious and ignorant savage as the work of evil spirits. Every tribe is accompanied by one or more of them. They are consulted on all important occasions, and their decisions are rarely controverted. An illustration of their power is mentioned by M. Wrangell, and occurred among the Tschuktschi at Ostrounoje-fair, in 1814. A sudden disease visited and carried off not only a number of the Tschuktschi, but also a great number of their rein-deer. A general consultation was held by the Schamans, in which it was resolved that Kotschen, one of their most distinguished chiefs, should be sacrificed to appease the incensed spirits. Kotschen was so much esteemed that the people, notwithstanding their usual implicit obedience to the Schamans, on this occasion rejected their decision. The sickness continued to rage, and Kotschen, like another Curtius, declared his willingness to submit. But such was the veneration in which he was held, that no one could be prevailed upon to execute the sentence, until his own son, urged by his father's entreaties, and terrified by his threatened curse, plunged a knife into his heart, and gave the body to the Schamans. Schamanism has no settled dogmas of any kind. It is not a system of belief, though so

widely diffused, but seems to originate with each individual separately, as the fruit of a highly-wrought imagination acted upon by external impressions.

The Tschuktschi are a peculiar race, and but little known. They are less civilized than the Jakuti, and retain more of their heathenish customs. Polygamy is general among them. Infants that are deformed or delicate, and all their old people, as soon as they become unfit for the fatigues of a nomadic life, are inhumanly destroyed. The nearest relations are the executioners.

Here also slavery exists. Whole families were found who had always been in a state of servitude. When interrogated as to the origin of this state of things, the reply was, "It always had been so, and must always continue to be so." The slaves are doubtless the descendants of captives. I must not omit a fact connected with the habits of this tribe which may be serviceable to the cause of temperance and health: Here in this intensely cold country, where one would suppose every means of warmth would be resorted to, every article of food is taken cold, when broth is made it is not tasted until it is quite cold, and then is often mixed with snow. They usually conclude their meals with a lump of snow.

ALMA MATER.

Jubemus te salvere, mater. PLAUTUS.

In freta dum fluvii current, dum montibus umbræ
Lustrabunt convexa, polus dum sidera pascet;
Semper honos, nomenque tuum laudesque manebunt
Quæ me cunque vocant terræ. VIRGIL.

The Alumni Association stands adjourned to meet on the third Wednesday of September in the College Chapel, on the evening of which day the annual address will be delivered by Rev. J. L. Schock. A full attendance of the members is earnestly desired and respectfully urged. After an absence of several years, it will be pleasant for us to meet again, to revisit the scenes of our former studies, endeared to us by a crowd of gentle associations, to clasp one another by the hand, to renew early affections and to strengthen youthful friendships. *Hæc olim meminisse juvabit* was the sentiment adopted by some of us when we bade a final adieu to our *Alma Mater*, and exchanged the holy quiet, the peaceful shades of Academus for the engrossing cares and responsibilities of life, the noise and bustle of a cold and selfish world. And although only a short period has elapsed since the oldest of us separated

from our literary parent, yet how true the prophecy! How busy memory loves to revert to those scenes, to bring fresh to the mind the reminiscences of those halcyon days! The recollection inspires pleasure mingled with sadness, such as the exile from his native land experiences, when he recalls to his remembrance the springs which slaked his youthful thirst, but whose freshness he may never taste again. To what other period do we refer with greater pleasure? What impressions are more lasting? What incidents do we recollect with greater zest, than those which distinguished our collegiate course? Meet in after-life, where you may, the companions of your early studies, and what a sympathetic feeling is at once established! The remembered facts and occurrences all rush to the mind—the College-roll is before you, and you run over the names in anxious inquisitiveness, with as much facility and accuracy as if answers were still made to its regular calls. The Halls are visited, the entries traversed, the rooms are named, and the occupants mentioned as if they still retained their places. How familiar the sport! How hallowed by delightful associations!

While, then, the recollection of College-days is yet fresh in our mind, while the image of its classic halls dwells in our memory, Pennsylvania College must be dear to us! Her interest should we cherish, for her prosperity should we pray! Our relation to her as alumni should awaken within our breasts a deep regard for her welfare. A tie, like that which binds the heart of a child to a parent, subsists between us. To this parent are we indebted for our intellectual training during youth, and, in a great measure, to whatever position of society we occupy. If we are qualified to take an honorable station in any of the professions, no small part of our qualification must be ascribed to the faithful and affectionate culture received within the walls of our *Alma Mater*. Every one, who has passed through a course of study in a literary institution, is greatly indebted to that institution, and ought to feel a strong and permanent impression of that debt. That debt we should bear in mind and gratefully acknowledge as long as we live. Recognizing these obligations, and urged by motives of filial regard and gratitude can we not do something for our *Alma mater*, to strengthen her position, extend her influence, increase her facilities for communicating knowledge, enlarge her means, and advance her interests? Can we not in some way testify for her our good will and our deep attachment? Can we not become her benefactors? She needs our assistance, our contributions, our sympathies, our prayers. Although regarded as the property of the church, she has as yet received comparatively little patronage from the church. The appropriation from the Commonwealth was

scarcely sufficient to erect buildings, and the annual donation has long since been withdrawn, in consequence of the pecuniary embarrassments of the State. With no endowed professorships, with no munificent patrons, without any revenue except that derived from the tuition fees, her wants must be pressing. Her debt should be liquidated, her Cabinet enlarged, her Scientific Department extended and furnished with additional philosophical apparatus, the shelves of her Library should be filled with thousands of volumes, and the number of her students quadrupled. To whom can Pennsylvania College look with so strong a claim as to her own sons? To whom can she appeal with so much confidence as to those who are proud to acknowledge her as their literary parent? Will they not come to her relief and render her some aid, or will they repudiate this debt of gratitude and permit her to suffer? Much has been done by the Alumni of other Colleges, for the Seminaries of learning in which they were trained. Yale, Harvard, Amherst, and other institutions of the East have been nobly sustained, greatly enriched and amply endowed by their sons. And shall we be less mindful of our obligations—less willing to perform our duty? Can we not, at the approaching meeting of our Association, adopt some plan for securing the object proposed? Allow us to offer some suggestions for the consideration of our friends:

1st. That every *Alumnus* annually pay into the Treasury of the College five dollars. This at present would amount to about five hundred dollars a year, which would be quite a handsome sum to appropriate to the Library. The next year we might purchase a *telescope*, which has long been a *desideratum* in the Institution—a gift, which would be a valuable acquisition to the astronomical department, and would no doubt highly gratify the Professor of Natural Science.

2ndly. That we solicit subscriptions from our friends and acquaintances. In almost every neighborhood are some wealthy individuals, who might be induced, if the subject were properly presented, to give a valuable donation, or unite with some others in establishing a professorship, or at their decease, if without heirs, to make the College their legatee. The reception of fifty volumes of books, or a legacy of one hundred dollars would be most gratefully received, and would be regarded as a strong evidence of our friendly feeling and attachment to the College.

3dly. That we make efforts to procure specimens in the various departments of Natural Science for her Cabinet. Minerals, shells, fossils, quadrupeds, birds, insects, corals, coins, medals, paintings, engravings,

ancient manuscripts, etc., will all find a welcome place in the beautiful Linnæan Hall, now in progress of erection.

4thly. That we make it our duty to present the claims of the College whenever an opportunity offers, exerting ourselves, on all occasions, to secure students, that others may possess the advantages which we one enjoyed, and the usefulness of our *Alma Mater* be enhanced and her opportunity of doing good increased.

5thly. That we remember her in our supplications at a throne of grace, that God would be pleased to pour out the influences of his Holy Spirit on instructors and pupils; granting unto them who preside over her interests that "wisdom which is profitable to direct"—that into this fountain of knowledge the salt of Divine grace may be cast, that from it streams may issue to gladden the city of our God; that the youth in a course of training may be kept pure, that their knowledge be sanctified, so that when they go forth into the world they may be prepared to act their part well on the great theatre of life, exert a conservative influence upon the community and prove a blessing upon all with whom they may come in contact. Let us endeavor to realize that the hopes of the Church cluster there; that men are now educating, who are to give tone to society, shape the policy of our country, influence generation after generation to the end of time, and perhaps decide the destiny of the world.

Alma Mater! Sit semper florens: semper honoratissima—semper beata!

COLLEGE RECORD.

The Corner-stone of the Linnæan Hall was, agreeably to previous notice, laid on the 23d ult. with suitable ceremonies.

Although the weather, on the day preceding, was very unpromising, in consequence of which, many of our friends from abroad were prevented from coming, we had nevertheless the pleasure of seeing a considerable number from a distance. The day of the ceremony, however, was most agreeable and favorable. A thin canopy of clouds, without depriving us in an important degree of the cheering light of the sun, shielded us from the intense glare of his heat. It was well that it was so, else the church in which most of the exercises were conducted, and which was excessively crowded, without accomodating many who were present, would have been very uncomfortable.

The Hon. L. C. Levin and his excellency F. R. Shunk were not present, as we had been led to expect, on that occasion. This was very

much regretted, as many were anxious to see and be addressed by these distinguished persons. The former, it was stated, was prevented from fulfilling his promise by indisposition, and the latter by a press of business.

At 9½ o'clock, A. M., the procession, consisting of the Speakers, the Faculty and visitors, the members of the Linnæan Association, &c., moved from the College edifice to Christ's Church, in which, after prayer was offered by Rev. Dr. Krauth, two addresses, delivered by Prof. S. S. Haldeman and Rev. F. W. Conrad, together with the excellent music furnished by the Brass Band from Newville, Cumb. Co. Pa., entertained, for several hours, an unusually large audience. The address by Prof. Haldeman was no effort to play the orator; not one of those displays of empty words and gorgeous imagery so often offered as an intellectual feast on such occasions, but it was simple, natural, appropriate to the occasion, and abounding, by way of illustration, in much interesting and most valuable information. None but those who were incapable of appreciating its merits, and who are in the habit of looking with stupid indifference upon the works of the great Creator in the natural world, could listen to it without being interested and delighted. We should regret our want of room to give an abstract of it, in the present number of the Journal, if we were not able to announce to the public that it will be speedily published in pamphlet form.

The Address by Rev. F. W. Conrad was an exhibition of the great value to our country and the world of virtue and intelligence; the important agency which educational institutions, such as Pennsylvania College of which the Linnæan Association constitutes a part, were calculated to exert in the formation of educated mind by the great facilities which they furnish; and a forcible appeal, in his usual felicitous manner, to the liberality of the publte for aid in the erection of the Hall. The appeal resulted in a collection of contributions to the amount of several hundred dollars. There are, however, yet needed for the completion of the Hall on the part of the Association from $1,000 to $1,200.

From the church, the procession moved to the site of the Hall, where, in the presence of a large concourse of people, the Corner-stone was laid, and the articles deposited by the Hon. James Cooper, who closed the whole exercises by an appropriate and eloquent address.

The articles deposited in the Corner-stone were as follows:

1. The History and Constitution of the Linnæan Association.
2. A list of the active and honorary members of the Association.
3. An Annual Catalogue of the officers and students of Penn. College.
4. A Catalogue of the Phrenakosmian Society.

5. A Catalogue of the Philomathæan Society.
6. The first and last numbers of the Literary Record and Journal.
7. A copy of the Order of Exercises of the day.

THE METEOR OF JULY 13TH, 1846.

It appears, from various accounts received from abroad, that the extraordinarily large and brilliant meteor, which apparently passed over our town on Monday the 13th ult., was seen over a wide district of territory. It was observed in places very distant from each other, not only in the direction of its motion, which we would expect as a matter of course, but also at right angles to that direction, which was not expected by those who saw it; each observer having been persuaded that it was near the earth, and that it passed nearly over his zenith. It was seen at points west of Gettysburg, and at numerous places east of it as far as the seaboard.

At Gettysburg, it seemed to burst upon the view at a point a little West of South and an elevation estimated at about 30°, to pass about 25° East of the zenith, and to be extinguished at a little East of North and an elevation of about 30° or 35°. It is very much to be regretted that no observations were made, by those who saw it, to determine these items with accuracy. It appears, however, that the meteor passed east of the zenith of each of the places from which we have heard, and at an angular distance from it not differing much from that observed at this place. From these facts several conclusions may be derived:

1. That, contrary to the first impression, the meteor must have had a very great altitude: for a body, whose zenith distance, over a line of country of one hundred and fifty to two hundred miles, at the same instant of time, did not vary more than a few degrees, must have had an altitude of at least several hundred miles.

2. As our atmosphere extends only to the height of about forty-five miles, the meteor was far beyond its limits, and the noise, which some thought they heard, was an illusion produced, no doubt, by the surprise of its sudden appearance and its great brilliancy.

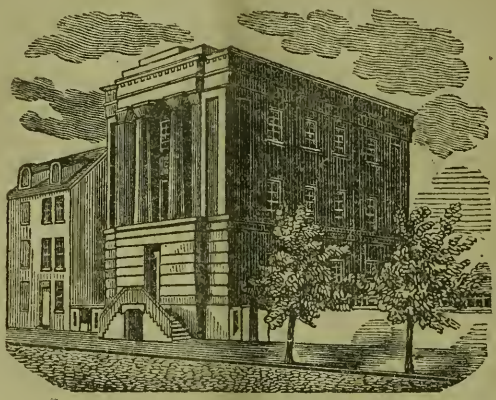
3. Its apparent magnitude, taken in connection with its great height, proves it to have been a body of enormous size.

4. Its great height is fatal to all those theories which assign to meteors an atmospheric origin, and its intense brilliancy at that height proves that their light, at least in some cases, is inherent. That those which find their way into our atmosphere become intensely luminous, in virtue of the condensation of the air before them in their rapid flight, seems reasonable; but here we have at least one whose light &c. are independent of such agency.

5. It is probable that none of the innumerable multitude of meteors belong to our atmosphere, but, being so many independent bodies, of cosmic origin, or having the same origin as the earth and planets, and revolving in their own appropriate orbits, some of them are, by the earth's attraction, brought into our atmosphere, where they explode and fall to the surface.

Pennsylvania Medical College,

Filbert above Eleventh street, Philadelphia.



Medical Faculty at Philadelphia.

WM. DARRACH, M. D.—*Prof. of Theory and Practice of Medicine.*
JOHN WILTBANK, M. D.—*Prof. of Obstetrics and Diseases of woman and children.*
H. S. PATTERSON. M. D.—*Prof. of Materia Medica.*
WM. R. GRANT. M. D.—*Prof. of Anatomy and Physiology.*
D. GILBERT, M. D.—*Prof. of Principles and Practice of Surgery.*
W. L. ATLEE, M. D.—*Prof. of Medical Chemistry.*
W. T. BABB, M. D.—*Demonstrator of Anatomy.*

The Lectures will commence on Monday Nov. 2nd.

Acknowledgements of Donations to the Cabinet of the Linnæan Association of Pennsylvania College.

July, 1846. From *Rev. Heyer*, Beads used by the Hindoos in worship.
2. From do. Cement and part of Buonaparte's coffin, St. Helena.
3. " Specimen of rock from St. Helena.
4. " Hanging bird's nest from India.
5. " Boodhist and Burmese idols from India.
6. " Ancient sculpture taken from an Indian palace now under ground, bearing an inscription 2000 years old.
7. From *Mr. A. M. Spangler*, Portrait of Dr. Nevin, Mercersburg.
8. " *P. Tate*, Reptile in spirits.
9. " *Henry Baugher, Jr.*, one coin.

Donations to Library.

1. Proceedings of the Academy of Nat. Sciences, Philadelphia, Vol. III, Nos. 1, 2 & 3, from the Academy.
2. Owen's Geological Exploration of Iowa, Wisconsin and Illinois, with Plates and Charts, from *Mr. G. W. Sharrets.*

Receipts during July.

Samuel Henry, Gettysburg, in full.

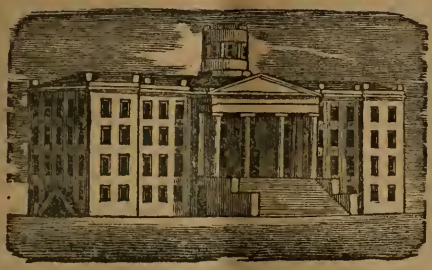
VOLUME II.] [NUMBER II.

THE

LITERARY RECORD AND JOURNAL

Of the Linnæan Association of Pennsylvania College.

SEPTEMBER, 1846.



CONDUCTED

By a Committee of the Association.

CONTENTS.

1½ sheet, periodical—Postage, 2½ cents, to any distance within the Union.

NEINSTEDT, PRINTER, GETTYSBURG.

THE LITERARY

RECORD AND JOURNAL

OF THE LINNÆAN ASSOCIATION OF PENNSYLVANIA COLLEGE.

Vol. II. SEPTEMBER, 1846. No. 11.

METEOROLOGY.

PHILOSOPHY OF STORMS. NO. II.

BY PROF. WASHINGTON L. ATLEE, M. D. PHILADELPHIA, PA.

In my first number, I promised to explain the cause of the barometer sinking in the centre of a storm, and continuing to stand low, notwithstanding the wind blows inwards. The difficulty to account for the continued depression of the barometer under these circumstances appeared so great to Sir John Hershel that, in discussing the paper read by Mr. Espy to the British Association at Newcastle, in September 1840, he considered it fatal to this gentleman's theory. The only way Sir John could account for the fall of the barometer was a centrifrugal force in the air, arising from the whirlwind character of the storms, as described by Mr. Redfield and Colonel Reid. Mr. Espy, in reply, called Mr. Hershel's attention to the following statements: Mr. Forth says, in the Philosophical Transactions that, during a great depression of the barometer on the 8th of January, 1735, he observed that the wind in the northern parts of the island blew from the north-east, and on the southern parts of the island from the south-west. Mr. Forth adds, that he does not understand why the barometer did not rise above the mean by these two concurrent winds. And Mr. Howard says, in a great storm of 1812, the wind, on the north of the Humber, blew from the East North East, and, on the South of the Humber, from the South West, with similar results.

As the barometer stands low, when the atmospheric pressure is diminished, and high, when it is increased, it must necessarily indicate the least weight in the superincumbent atmosphere immediately over the region in which it stands lowest. There must then be less resistance in this particular region, than in those parts surrounding it where the elevation of the barometer is greatest, and, in accordance with the established laws in Dynamics, there must be a rushing inward of air to where

the resistance is least. Now if the air, which comes into this region, would continue of the same density as before it leaves the surrounding parts, then an equilibrium would be established and the barometer consequently would have to rise. But the atmosphere, like all other gaseous matter, expands when it comes under less pressure, and the result is, that so soon as it passes within the region where the barometer is lowest, it must *expand.* This concentring body of air, now expanding, must become specifically lighter than it was before, and of similar density to the air previously within this region; and now being lighter it must *ascend* and give place to the pressure of the more dense atmosphere around it. *There must then be an ascending column of air over that space*, because the air within is always more expanded and lighter than the air without the storm. This phenomenon is illustrated in miniature by what takes place in a flue of a chimney communicating with the fire. The fire, heating the column of air above it, makes it specifically lighter and causes it to ascend, and so soon as this upward motion is given to it an inward motion is communicated to the surrounding air below, which rushes in from all sides towards the base of the flue, immediately expands, and also ascends. This is proven by the light bodies which are frequently carried in to and up the flue by what is usually called the *draught* of the chimney, or, in other and more philosophical language, by atmospheric pressure.

Although the air expands so soon as it comes within the region of diminished pressure, yet it continues to expand more and more as it ascends in consequence of coming successively under less pressure. Here another difficulty appears to arise. If the air flows in from all sides and ascends, it must, unless afterwards disposed of, create an immense column, whose accumulated weight, though specifically lighter than the air around, ought to raise the barometer in the centre of a storm. But there is a method by which this great influx of air is rapidly disposed of, and even had we no means of explaining its efflux, the indications of the barometer would prove the fact beyond all doubt. As it is my desire to unfold this theory regularly, step by step, it will be premature, at this stage of the inquiry, to enter into the explanation of this part of the phenomenon. It will be necessary, for the present, only to announce the fact that the air which comes in below *passes outward above*, and thus prevents the accumulation within the column of all the air which enters it. I may again refer to the flue in illustration: the smoke and light bodies, which are carried up, soon spread out above and glide away on the surrounding atmosphere, thus offering no impediment to the continuance of the upward current.

We are now prepared to understand why the barometer sinks in the centre of a storm, notwithstanding the air blows in from all directions towards that point. The expansion and ascension of the air within the column, and its emission above, will rapidly carry off the inward current below; and, so long as the causes, which diminish the specific gravity of the air within the storm, continue to operate, so long the barometer will continue below the mean.

Thus far, I have confined my observations to the phenomena that occur, during the action of a storm, to the atmosphere, without regarding the vapors which it contains. But as this has an essential connexion with these several conditions of the air, and with the formation of clouds, and as its consideration would make this communication too lengthy, I will reserve this interesting part of the subject for my next number.

ON THE ROTATION OF ASCENDING BODIES.

On Saturday, September 10th, 1842, Mr. J Wise of Lancaster, Pa. made a balloon ascension from Gettysburg. During the early part of the day, it was cloudy, causing considerable apprehensions of unfavorable weather for the ascension on the part of the æronaut and his numerous spectators. But, at 1 o'clock, P. M. the clouds broke away, and the wind, which was very gentle and had until that hour been from the N. N. E., gradually veered round to the N. W.

Upon looking at the first *pilot balloon*, which Mr. Wise sent up at noon, I observed it, as it moved off towards the south, to be revolving on its axis from *right* to *left* in front, or in a direction contrary to the motion of the hands of a watch lying with its face upwards. My curiosity was excited by it, and believing that, if its rotation was in obedience to a great physical law, it would, if at starting it were made to revolve in a contrary direction, viz: from *left* to *right*, gradually lose the communicated rotation and acquire that which it was observed to have. Accordingly I requested Mr. Wise to give his pilot balloon a rapid revolution from left to right, before he permitted them to escape from his hands. This he kindly permitted me to do, giving me their entire control. I noticed that, in every instance after they had ascended to the height of about one hundred yards, the communicated rotation was lost and gradually one, in the direction in which the first was observed to rotate, was acquired, with which it moved off at a height above the earth of about three hundred yards. The large balloon, moreover, with which he made his ascent, also began to revolve in a similar man-

ner, about once per minute, after he had risen a short distance above the earth, and continued to do so at least until he passed through a mass of cloud and was concealed from view. The rotation of the large balloon was easily observed from below, by watching a flag which he had fixed to the side of his car. He farther stated that he had frequently noticed that pieces of paper, &c. dropped out of his car acquired a whirling motion in descending to the earth.

On Saturday, October 1st, prox. Mr. J. M'Clellan, instead of Mr. W., made an ascension from the same place, at which time the *pilot balloons* by the politeness of Mr. Wise, were tried in a similar manner, with similar results.

These facts, together with the rotation, in the same direction, of whirlwinds and fluids flowing through a funnel, are interesting as they all point to some common physical cause. I am aware that the vorticular motion, in one invariable direction, of fluids flowing through a funnel has been denied on high authority; but when fairly tried it will always be found that the rotation will be from right to left, and that if even, by oblique pouring, a contrary rotation at first be communicated, this will soon cease, and be followed by a state of quiescence or an opposite motion. It also happens that occasionally a whirlwind may be observed to rotate from left to right, but then it is found to be confined within narrow limits as to space and duration. These whirls are but eddies produced by atmospheric currents flowing obliquely against obstacles, like those similarly produced in water; but the regularly developed whirlwind, carried along in free open space, always rotates in one invariable direction in the same hemisphere.

For some years previous to the date of Mr. Wise's ascension above mentioned, I had become interested in the science of Meteorology, especially after the perusal of the able papers on that subject, published in our scientific journals, by Prof. Espy and Mr. Redfield. The two in some respects rival theories of storms of these gentlemen called forth much discussion, and very naturally directed attention to their relative merits. Whilst too much praise cannot be awarded to the former for his indefatigable labors and the vast amount of new and interesting truths which he brought together, mainly through his own individual exertions, I must confess that in my view Redfield's theory of *rotary* or incorrectly *centrifrugal storms* conforms more nearly to the facts of observation than does that of the Prof. E., which maintains that there is an afflux air from the exterior towards some central point or line, and which has therefore been called the *centripetal theory.* Agreeably to Redfield's theory, the rotation of the great storm-cloud is from right to left, and

therefore only an exemplification, on a gigantic scale, of what is witnessed in the whirlwind, and the flowing of water from a funnel.

In speculating upon the physical cause of these phenomena I had, as early as 1839, come to the conclusion that they had their origin in the revolution of the earth on its axis, and, in endeavoring to explain Redfield's theory of storms, had recourse to that as the cause of their rotation. Neglecting to communicate these views to the public, until I should be fully satisfied of their truth by further observation and reflection, I had the pleasure of seeing them presented in an interesting paper by Charles Tracy, and published in Silliman's Journal for July, 1843.

To explain these views concisely, let us suppose two particles of air on the same meridian, one at 28° and the other at 30° north latitude, to start towards a point between them at 29°, (see Fig. 1.), they could not, in consequence of each having the velocity of rotation of the earth due to its latitude, meet at that point. The velocities of rotation at the several latitudes of 28°, 29°, and 30°, are 915.1, 906.6, and 897.6 miles per hour. Consequently if an hour were required for these particles to pass from 28°, and 30° to the intermediate parallel of 29°, the southern particle, having 8.5 miles greater eastward velocity than the point A, would, after the lapse of an hour, be found that distance east of that point, and in like manner the northern particle N would be found, at the same time, 9 miles west of that point, or the two particles N and S would be 17.5 miles apart, each having moved in a curve more and more inclined in its respective direction. The same would happen with all other particles starting from the same or adjacent points. Now as these curves are oblique to each other the moving particles would have a tendency to communicate to the mass of air, through which they must pass, on opposite sides, motion around that point precisely in the direction indicated, viz: from right to left.—(See Fig. 2.)

Fig. 1.

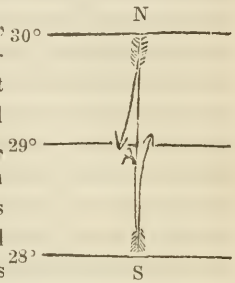
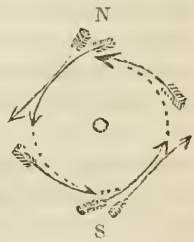


Fig. 2.



But to reduce this from the large scale, on which the extended storms take place, to that which exists in the smaller thunder-cloud, the vorticular motion of a fluid in a funnel, and the small *pilot balloons*, let us suppose that, in latitude 40°, two particles of air, in a circle of three feet in diameter, were to start from opposite points towards the centre, and if it required them one second of time to

move one half that distance, they would not meet at the centre, but pass each other at a distance of .014 of an inch, the one being on the east and the other on the west of that point. These two particles, as also all others which are moving towards that point, must operate as oblique forces, and though each separately considered is of that order which may be denominated *infinitessimal*, in their combined effect they produce a rotation from right to left depending for its violence upon the amount of inward pressure and the velocity of influx. This influx is spirally inwards as represented by the arrows in Fig. 2.

The conditions, then, of this kind of rotation are: 1st, rarefaction, maintained by any cause whatever, in a body consisting of movable particles, such as liquids and gases; 2nd, the free motion of these particles in space, without the modifying influence of obstacles; and 3rd, the Earth's rotation. The *rarefaction* in the middle of a funnel is maintained by the constant descent of the fluid through the throat; in the case of the balloons alluded to by the confined hydrogen, which together with the materials of the balloon, constituted a light mass which the surrounding denser particles were constantly displacing; in that of an ordinary whirlwind, it is originally produced by heat at the Earth's surface; and in the storm-cloud it perhaps has its origin and perpetration in the heat given out in the cloud by condensation.

If the explanation just offered of the facts under consideration be correct, and it is difficult to offer any other which is not burdened with insurmountable objections, then it follows that the rotation of fluid particles tending towards a common point or area in free space is a great physical law. Again, if this law determine the rotation in the northern hemisphere to be from *right* to *left*, that in the southern hemisphere must be from *left* to *right* or in the direction of the motion of the hands of a watch lying with its face upwards. A scientific friend, to whom this deduction of theory was stated, made arrangements with a ship master, sometime since, to have it tested by observation and experiment to be made during a voyage to the East Indies. If theory be sustained by the facts of observation, of which there is no doubt in this case, then a most important law in Meteorology will be established. And hence it is difficult to escape the conclusion, that rotation must take place in *all cases* in which there is a free flow of particles from all sides towards a central area either movable or stationary, and that Redfield's theory of rotary storms is to be regarded as no longer in dispute, but as belonging to our common stock of knowledge.

AGRICULTURAL EDUCATION. NO. II.

In my last, I gave you a concise view of public action upon Agricultural Education. I also stated the divisions into which agriculture naturally falls, viz: *practice* and *science;* and a further division of practice into *manipulation* and *economy*, adding by way of explanation, some remarks upon manipulation.

In this I propose to consider the second subdivision, *Economy.* It will be needless for me to enter upon a detail of the various uses to which the word economy has been applied. You are well aware, that there is scarcely any word of wider signification, from the ancient "management of a family" down to the more modern and popular one of "frugality," or stranger one, "system of matter." Its application to agriculture is rather of modern origin, and by both French and English writers is applied so as to signify the whole system of agriculture. With them "Rural Economy" is synonymous with agriculture. As a subdivision of my primary division, *practice*I, intend to include all that which lies between manipulation and science,—those results of judgment which flow from just reasonings upon observations and principles and adaptations of means to ends in a fitting manner,—in a word that skillfulness in disposition and arrangement and proportion which ensures success. You will perceive that this is and can only be the result of science and experience. It reaches to all the detail of the business, and detects the quackery of empirical laws and rules.

It is a wonderful fact, that one farmer will receive larger crops of grain from his land than another, but will net less profit than the latter, simply because he does not understand this portion of his business which I comprehend under the term economy. You will understand that it is not niggardliness nor a remarkable frugality, but a fitness of arrangement of all things, so that nothing is lost—each thing and act possesses such a relation and position as to enhance the value of every other thing and act in the conduct of the enterprise. A gentleman, for many years a farmer in Chester county, Pa., but now a resident here, but lately remarked to me, "I could raise more per acre in Penna. than a farmer does here, but I never could make as much money, they understand it better than we do." By the "we" he meant ourselves, being Pennsylvanians, as representatives of the farmers of our native State.

The ideal of this *economy* may perhaps be sketched by an able pen, or thrown into a code of maxims and rules; but its practical value and comprehension can never be engrafted upon any one without the daily

and intimate observation of its course in the management of a good farmer.

It is after all the possession of this economical skill, which causes the rustic year to glide prosperously and pleasantly away. It is that branch of agriculture which is directly dependent upon science. In fact economy is but the using and executing of the laws which emanate from science, when viewed in the direction of its parentage. The laws of nature are immutable and cannot be violated with impunity. Their observance, on the other hand, is rewarded with the attainment of our desires. As, therefore, their is no occupation or profession which is dependent upon a wider reach of those various laws, an accurate and minute knowledge of them is necessarily required by the economy of agriculture. It is true, that agriculture has been pursued with some degree of pleasure and of profit under the reign of empiricism, but how imperfect and uncertain have been its results; verily, the earth has not brought forth its increase.

It has been remarked of Gay Lussac or Lavoisier, I do not at the moment remember which nor my authority, I think Gay Lussac, "The land without Gay Lussac yielded its ordinary increase, but Gay Lussac, the owner of land, caused it to yield a threefold increase. You will infer, and justly so, that a knowledge of science, and the habit of scientific reasoning is necessary to the acquisition of agricultural economy.

The second division of agricultural education is, *Science.*

Here I do not intend to enter upon a direct argument, to shew that there is such a thing as an agricultural science. In this day, that is sufficiently manifest. There has always been an agricultural science. The advances of improvement in the manipulation and economy have been always and only the fruits of that science. Thomas Jefferson developed the mechanical principles of the construction of the mouldboard of our ploughs, and in 1798 proposed to make them of cast iron. His son-in-law, Governor Randolph, invented the hill-side plough.

Heretofore this science has been exceedingly corrupted, without system, and its influence upon practice consequently weak. At the present day it is beginning to assume form and system, and slough away the unwholesome tenets and maxims of empiricism. It is rapidly attaining the strength of healthful manhood, and the effects of its influence upon the practice of agriculture are daily manifesting themselves. The press is fruitful in matter, and the monthly bulletins of publishers contain 3 and 4 new publications upon some topics in relation to this science. Agricultural periodicals, commenced in 1818, are now numerous; they range from the agricultural column, in the weekly newspa-

per, to the high toned and ably conducted scientific monthly of one hundred closely printed pages. Such for instance, not to mention the foreign monthlies and quarterlies, is 'The Farmer's Library and Monthly Journal of Agriculture,' published in New York city, and edited by that able veteran in agricultural improvement, John S. Skinner, Esq. formerly of Baltimore, and the former orignal editor of the American Farmer. It is a work well worthy the attention of your Linnæan Association. It is a work of science as well as practice. The science of Agriculture is assuming a body, though its full figure and proportions may not yet be clearly discernable. Allow me, for a little time, to spread before you the elements of that science.

The cultivator of this, as of all other science, must be prepared for the work, by a spirit submissive, and a sense of dependence upon the Great Creator, if he expects to enter the "*intima adyta*" and there taste the sweets of its fountains, and be refreshed by the visions of its secret things. In a former communication I remarked, man was not averse to knowledge, but I would by no means imply that there is any other door of entrance to the chambers, the beautiful chambers of truth, than through Christ. He is the way; and further, the secrets of the Lord are with them that fear Him. I have never yet found the scriptural authority for limiting these declarations to what is commonly understood by religious truth. It seems both a rational and scriptural conclusion, that the Author of all things should have a knowledge of all things, and that he communicates that knowledge to those who wait on him for it, in the spirit which he approves. He no where tells us he has limited his gifts to religious knowledge. I know there are those who hoot at such doctrines, but to such I can only say that, if they will trace down the history of each science, or art, or profession, they will find that each ray of light is traceable to a Christian truth—some item in that great body of truth which emanates from Christ.

Dr. William Darrach, Prof. of the Theory and Practice of Medicine in Penna. Medical College, traced this out in regard to Medicine in his Introductory of last fall; Dr. Hitchcock, about the same time, displayed it in regard to science and literature generally in his Inaugural as President of Amherst College. Others have performed similar work within the last three or four years.

Your own Haldeman, in his recent address before the Linnæan Association of Pennsylvania College alludes to the same, when he remarks: "And yet Linnæus was indebted to a theologian of by-gone ages for his primary division of the works of the Almighty," &c.

A preparative, then, for the study of agricultural science is a firm be-

lief in the doctrines of Christianity, with a spirit bent to Christ. It is true, men may disregard Him, and discourse learnedly of thoughts and things, and reap their rich fields of golden grain, but they know nothing of their richness and the high pleasures they afford; they can never walk with Isaac, at eventide, to meditate in the fields, or sit at the tent's door to enjoy with Abraham the company of angels.

Excuse this digression, it sprang from a consciousness of the difficult task I was about to undertake; the delineation of a system of agricultural science. Its elements float in scattered patches, separate or confused with other things upon the broad ocean of "nesciense." Whether I shall be able to find the central force to attract them around a common point, and assume their relative positions and proportions must remain to a future period.

Scientific and Practical Agricultural Institute,
Walden, Orange Co., N. Y., August 10, 1846.

THE METEOR OF JULY 13TH, 1846.

BY DANIEL KIRKWOOD, OF LANCASTER, PA.

In the last number of the "Record and Journal" some notice was taken of the meteor which passed over Maryland and Pennsylvania, on the evening of the 13th of July, 1846, and which was visible, at the same time, in the adjacent States of New Jersey, Delaware and Virginia. The writer of that article, however, does not seem to have had sufficient data for making any very accurate calculations in regard to the phenomenon. In order to obtain information on the subject, I have been at some pains to collect and compare as many newspaper descriptions of the appearance as possible, and have also corresponded with scientific gentlemen residing in various parts of the country. The following is the result of my investigations:

The course of the meteor was about N. 35° E. It was vertical somewhere between York and Lancaster, as the almost unanimous testimony of those who saw it from the latter place, is, that it passed a few degrees to the N. W. of the zenith; while my friend, Mr. D. M. Ettinger, of York, assures me, that, when East of that place, its distance from the zenith was ten degrees. Mr. E., who had a fair view of the meteor from its first appearance, is a practical surveyor and mathematician, accustomed to the greatest accuracy in the measurement of angles, so that his estimate may be received with perfect confidence. Now if we imagine a line, corresponding with the direction of the meteor, to be drawn through York, its nearest appearance to Gettysburg will be found to be about 17

or 18 miles; and as the greatest angular elevation of the body at the latter place was about 65°, we are enabled, by a simple statement in trigonometry, to determine its height, which is thus found to have been about 62 miles. A correspondent of the Philadelphia Ledger asserts that the elevation of the meteor when west of Philadelphia was 42°, which would indicate a distance from the earth, differing less than a mile from the above determination. The data, furnished by a private correspondent at Newark, Del., give also very nearly the same result.

The apparent diameter of the body has been variously estimated at from $\frac{2}{3}$ to $\frac{1}{6}$ that of the full moon. Admitting it to have been $\frac{1}{4}$, or eight minutes, the true diameter must have been about 720 feet, or rather more than a furlong. The apparent length of the tail, it is agreed, was at least one degree; consequently its true length exceeded a mile.

The first appearance of the body as seen from Lancaster was at a point about 30° or 35° above the South-western horizon, and its disappearance occurred at the same elevation in the North-west. The length of its track was therefore rather more than 200 miles. Supposing it to have been visible 16 seconds, (and this is less than the general estimate, although it exceeds some others,) its velocity was about 13 miles per second, or two thirds that of the earth in its orbit.

But what was the nature of the brilliant train by which the meteoric body was attended? Was it one continuous blaze proceeding from the ignited nucleus? or was it merely an optical illusion, similar to that by which we see an unbroken ring of light when any luminous object is caused to revolve with great rapidity in a circle? That the latter was the case, will, I think, be clearly established by the following facts: The impression which any visible object makes upon the fibres of the retina is retained for a very short time after the object itself is removed. Now in the case of the revolving luminous body, it has been found by experiment, that when it makes less than ten revolutions in a second, the ring is interrupted. The retina then preserves the impression about one tenth of a second. Any body, therefore, moving in a straight line, would be visible at the same instant in every part of its track through which it passed in that time; and as the length of the train, according to the above determination, is very nearly equal to the distance passed through by the nucleus in the tenth of a second, it may be fairly inferred that this appearance was nothing more than the optical effect of the body's rapid motion.

I have been assured by persons in Harford county, Md., Chanceford, York county, Pa., and in York borough, that very shortly after the disappearance of the meteor a distinct report like that of a distant cannon

was heard. As this was noticed by a considerable number of persons, and in places so remote from each other it is scarcely possible they could have been mistaken. As might be expected, their estimates of the interval which elapsed were different; but an intelligent gentleman, who was paying particular attention in expectation of a report, states that it was at least six minutes. This would indicate a distance of about 70 miles at the time of the explosion. But here we are met by the question, whether a sound originating at so great an elevation from the earth could reach its surface. It is well known that the intensity of sound depends upon the density of the air by which it is conveyed. The distance at which the report of a pistol can be heard upon the summit of a lofty mountain is much less than if fixed upon the plain below. The collision of solid substances, as the ringing of a bell in an exhausted receiver, produces no sensible impression upon the ear; and as the rarefaction of the atmosphere at the height of 60 miles is much greater than that which we can produce by the air-pump, it is manifest that a sound originating at that elevation, to be heard by us, must have an exciting cause inconceivably greater than any with which we are acquainted. This was doubtless the case in the present instance, if we consider the size and immense velocity of the meteor. There are, moreover, undoubted instances on record of meteoric explosions at even greater altitudes being distinctly heard. The great meteor seen in England, March 19th, 1719, was about 70 miles from the earth's surface at the time of its explosion. The report, notwithstanding, was like that of a broadside, and so great was the concussion that the windows of houses were violently shaken. It has, however, been suggested "that at these enormous heights sound may owe its propagation to some other medium more rare and elastic than air, and extending beyond the limits of the atmosphere of air and vapor."

THE METEOR CONTINUED.

In connection with the preceding valuable communication, we publish the following extract of a letter from a scientific correspondent. Our readers will perceive that the data, upon which the notice of the meteor in our last number was based, were imperfect. But as that notice has elicited more definite and valuable information from abroad, than we were able otherwise to obtain, it has done a good service. We heartily concur in the concluding suggestion of our correspondent.

New Haven, Conn., Aug. 8, 1846.

* * * In the "Literary Record and Journal of the Linnæan Association of Penna. College," Aug. 1846, I notice some account of the splendid meteor of the 13th ult. This body was also seen by several persons in New Haven, and tolerably well observed. The observations

were published in the Daily Herald of this city, but as I have seen no copy of them in other papers, I fear they have not come to your knowledge, and therefore take the liberty of sending you the principal particulars.

Time, July 13, 1846, 9h 30m± P. M., New Haven.

Place when first seen.	Az. 69° West of true South; altitude 10° —both uncertain, probably two or three degrees; and moreover the observer probably did not notice the meteor at the instant it became visible.
Place of disappearance.	Az. 87¾° West of true North; altitude 7½° to 8°. Azimuth may be one degree more or less; altitude very nearly correct.
Motion, exceedingly slow.	Time of flight not less than 20 seconds.—This seems scarcely credible, but the chief observer, who is an exact man, well aware of the danger of over-estimating small portions of time, thinks the time even longer.
Apparent size.	Equal to that of the planet Venus on the average, at the same altitude.

The meteor left no train, emitted no sparks, and did not vary in brightness during its course.

Unfortunately I did not see this magnificent meteor, but as it was quite well observed by a gentleman on whom I can rely, I thought it a duty to put the observations in a proper shape and send them to the press, as I have done in many similar cases. Several accounts of the same body have come from Penn., N. Y., and Va., but so miserably defective as to be of scarcely any use. Until I saw the notice in the Record, I could form no satisfactory opinion of the elevation and size of the body. And, as you see, many more observations must yet be compared before we have the meteor's history. The very slow relative motion of the meteor led me at once to suppose that it was travelling nearly in the path of the earth, overtook and passed by it, with a real velocity of perhaps twenty-five miles per second. That point of the Ecliptic towards which the earth was then tending was at that hour beneath our horizon and in the N. E. quadrant. The elevation of the meteor at extinction could not have exceeded thirty miles, and was probably somewhat less. Its size must have been very great to have presented at this distance so large a light, (for definite disc could not be seen), probably not less than 200 feet in diameter, perhaps more; and yet there is so

much danger of illusion that this element should be derived from an estimate of the angular diameter taken as near as possible.

The suggestions in the fifth section seem to me just. All shooting stars and meteoric fire balls, meteorites, &c., must be considered cosmical; but their collision with our atmosphere is more likely to result from accidental intersection of paths, then from the earth's attraction, although doubtless the latter cause has some operation.

Allow me to urge the importance and duty of efforts to collect materials for a full understanding of this celestial visitant. The Record will furnish an excellent place for the publication of the results. * *

EPISTLES TO STUDENTS.

YOUNG GENTLEMEN:

You are addressed by one who feels a deep, a very deep interest in your welfare, and who, having had some experience in the world, is, in some measure, prepared to impart to you useful advice. He proposes to communicate his views in the spirit and tone of an affectionate father, and his counsel and admonitions will not be unaccompanied with prayer to the Father of Mercies that he may bless to you whatever shall be written in accordance with his will.

Your friend, who comes to you with his admonitions, is a firm believer in the truth of Christianity, and therefore the christian element will necessarily pervade whatever he writes. It is not proposed, however, to furnish homilies on religious duties, or to present appeals on the important subject of undelayed repentance. Your teachers, being men who fear God, and work righteousness, will attend faithfully to your religious interests, and will reprove, rebuke and instruct as their vocation requires. It would not be proper to render the "Journal" a vehicle for religious didacticism, or hortatory injunctions on the subject of christian experience or biblical ethics.

These statements are made at the threshhold to disarm prejudice, and to prevent the apprehension that lessons often inculcated and exceedingly familiar are to be repeated. No beaten track is to be pursued. You are to be addressed from the heart and on the basis of the experience and observation of your correspondent. It may be thought, after so much preliminary matter, that it is proper that some topic should be introduced, and disposed of. This demand will be heard, with the single additional preliminary remark, that no promise can be made that a very logical thread will run through these letters, or that they will be any thing more than plain, unadorned, and candid representations.

Your attention is directed, in the first place, to the position which you occupy. You are members of Pennsylvania College. You have passed through the probation required by the Students of that institution, and have solemn vows upon you. Your truth and honor have been pledged before God and man, that the salutary and mild regulations enacted by the authorities of the institution for the good of its sons, and consequently for your good, shall be sacredly observed by you during your continuance in it. If you analyze the formula which you have pronounced and which has so powerful an obligatory force upon you, you will discover that it is neither oppressive in itself, nor arbitrary. It embraces, first, "respect to be paid to your instructors and others." It surely cannot be regarded as unreasonable to require of you this. If there are any human beings in the world, who, next to your parents, deserve not only to be respected, but honored by you, it is they who are exercising the laborious and self-denying office of Professors in our literary institutions, and particularly such as are not endowed. They merit it for their education and learning, they deserve it for that tried worth which has secured them their responsible posts. They deserve it on account of their patient toil in your behalf, their numerous and anxious consultations for your good, and the fervent addresses which, both in public and private, they make at a Throne of Grace for your spiritual good. For the time being, they are *in loco parentum*, and they watch over you with affectionate interest, and seek God's aid that, when the destroyer cometh, "he may find nothing in you."

This relation between the student and his teacher should be well understood. Well should the former be acquainted with it, that he may not put himself into an unnatural position, and be led with a parricidal criminality to smite the arm which is stretched out for his support. If it should happen, as it may, that the Professor is unworthy the respect that is claimed for him, it is a great evil, but one which will find a remedy in the power which has appointed him. Having commenced our journey together, we will now put up for the present, with the hope of speedily renewing it. Till we meet again, we commend you to God.

Yours truly.

CATALOGUE OF PENNSYLVANIA COLLEGE FOR 1846.

This publication is now lying on our table, from which we learn that *one hundred and ninety-three* students have been connected with the Institution during the current year, an increase of *forty-five* over last year, and the *largest number* that has been reported since the organiza-

tion of the College. The roll during the present session, we understand, has registered more in actual attendance than at any previous period. The enterprising spirit evinced by the members of the Institution in the publication of a monthly *Literary and Scientific Journal*, the improvement of the grounds attached to the building, and the erection of a large and beautiful *Hall*, for the reception of the valuable and increasing *Cabinet* of the Linnæan Association are all encouraging indications of the flourishing condition of this seminary of learning.

Pennsylvania College, we think, has peculiar claims upon the patronage of the community. Few institutions offer more inducements for young men to enter their walls or furnish greater facilities for the acquisition of knowledge. Its location is beautiful and proverbially healthy. Its government is paternal and the tone of its moral feeling is perhaps higher than that of any other literary institution in the land. The terms are reasonable and the course of instruction extensive. Of its Faculty we need not speak. All, acquainted with the gentlemen appointed by the Trustees to give instruction, know that they are zealously devoted to their work and deeply interested in the mental and moral improvement of those committed to their care.

This Institution especially needs the sympathies of the Church under whose auspices it was established. Its importance to the ministry cannot be too highly estimated. Here the youthful mind is developed under the influence of those sacred truths which we value above all price. Here is exerted a power designed to elevate the intellectual character of the Church, and furnish those who minister at her altars with that knowledge so essential to success.

Those, who projected the establishment of this Institution, and have been laboring faithfully and indefatigably from the beginning to advance its interests, must regard its present prosperous position with the most lively satisfaction.

We have, however, wandered from the object we had in view, when we seated ourselves to notice the Catalogue. Our design was not to urge the claims of the College. It has won its way to public favor, and procured the confidence of an intelligent community without a resort to that system of puffing practiced so generally at the present day. Her growth is not of a mushroon character. She has risen by her own intrinsic merits, and now occupies an honorable position among the first institutions of the land. Our object is to present some reflections, suggested by the appearance of the Catalogue, relative to those who have gone forth from the College, and, *baculum in manu*, commenced the active duties of life. Although not much more than a half score of years has

elapsed since the College came into existence, upwards of *one thousand* students have enjoyed the advantages of its instruction. *One hundred and five* (including the present graduating class) have passed through the prescribed course and are enrolled as its *alumni*. Of those who have entered upon active life and are pursuing their respective vocations, all, we believe, are answering the wishes of friends and realizing the expectations of their *alma mater*. No one has fallen by the way, forfeited the confidence reposed in him, or shown himself unworthy of his literary parent. Considering the brief term of her existence, Pennsylvania College has accomplished much. Her sons are distributed here and there, in the varied employments of life, throughout almost the whole American domain, occupying posts of honor and usefulness. At home, abroad, in the West, in the far West, ever in distant climes her alumni are to be found, discharging the responsible duties of society and fulfilling their high destiny.

It may, perhaps, be interesting to those, who have not the information accessible, to learn in what sphere of action those, who received the charter of their character from Pennsylvania College, are employed, and, if the statistics were within our reach, we should be glad to follow all whose names appear on the *matriculation* book, and inquire how many are pursuing the straight forward path of rectitude and practicing the lessons of wisdom taught them by their *alma mater*.

Of the one hundred and five graduates, *seventy-four* have either commenced the work of the ministry or are in a course of preparation for it. *Six* have entered the medical profession or are qualifying themselves for this field of usefulness. It has furnished the bar with *sixteen*, some of whom have filled executive appointments. It is represented in the editorial corps and in state legislatures. *Three* are engaged in the mercantile business, *one* in agricultural pursuits, *three* are holding Professorships in Literary or Theological Institutions, whilst upwards of *thirty* have been employed, at different periods since their graduation, either as Tutors or Instructors in Academies, etc. Even in the foreign field, Pennsylvania College has her representative—in distant India, one of her sons may be heard unfolding the sublime doctrines of the Bible, and proclaiming the glad tidings of the Gospel to the benighted heathen. The asterisks of the Catalogue indicate that *three of the Alumni* have deceased, all of whom, we have heard, were sustained in the trying hour by the all powerful consolations of religion, and met with a triumphant death, leaving the clearest and most decided testimony to the preciousness of Christ and his Gospel.

With these facts before them, have not the friends of Pennsylvania

College reason to be grateful for the position she occupies—the good she has accomplished? The little seed, which was sown only a few years since, has already taken root and is yielding fruit. Judging from the success that has attended her past career, is not Pennsylvania College destined to become pre-eminently useful? If the smiles of Heaven continue to rest upon her, may not still greater results be expected than have already been accomplished?

The destiny of our beloved Republic—all that is valuable in liberty, all that is precious in our institutions is soon to be entrusted to those who are now in a course of training in our seminaries of learning. If we wish the rich inheritance we enjoy transmitted, unimpaired to posterity, should not the public eye be directed with anxious solicitude to the youth of the nation? May Pennsylvania College send out many, as proofs of her excellence, who may become an ornament to society, the pride of their country, bright and shining lights in the Church, exercise a conservative influence upon the land, and prove a blessing to the world; sons of whom she may never have occasion to feel ashamed; to whose names she may point in all coming time with affectionate exultation, exclaiming with the mother of the Gracchi: *These are my jewels!* In whatever department of life her *Alumni* may be called to serve their country, may they never forget the academic shades in which they were nurtured, or lose the conviction that they are held, by their early vows, to connect the accomplishments of the scholar with the character of the citizen, the christian and the man.

Proverbial Philosophy. By Farquahar Tupper, Esq. A.M.

The above is the title of a book, that comes before us with more than usual pretension, and a careful perusal of it will satisfy the most fastidious caviler, that it can scarcely be prized too highly. Such a collection of good things, so well expressed, cannot be found between the same quantity of pasteboard and muslin in any language. Tupper is a perfect master of the heart. He reads man as we do books, and from their actions and appearances makes his estimate of them. He knows himself and can, on this account, paint others correctly. He possesses the rare faculty of saying a trite thing in such a manner as to give it the charm of novelty. He attracts our attention by the beauties of his style, draws us gradually on by the smoothness of his periods, and chains our senses by the splendid sentiments which he clothes in such beautiful language. No one can read his book without being made better. Every one can see himself as in a glass; every phase of character, every

eclipse of virtue by vice is there portrayed to the life. I never read a book which I liked better, though I have been more strongly fascinated by some splendid fiction, which lost its influence as soon as I permitted my reason to rule in her proper dominion; but in perusing this book reason coincides with and approves every thing which my feelings prompt. I am at the same time pleased and instructed; at once gratified and informed; my stock of knowledge is increased, whilst my heart is made better by the consideration of truths inculcated and philosophy laid down. In these days, these enlightened days of the glorious nineteenth century, when every one is more or less tinctured with *Transcendentalism*, when every student is a Biblio-maniac, and when every writer, catering to the public taste, seeks new methods of conveying instruction, and new channels through which to communicate knowledge, it is a very rare thing to meet with a book containing as much of truth imparted in so very attractive a style. As much of its freshness, it must be confessed, resembles that of a college surloin of beef, served up variously for dinner, supper, and breakfast, so Tupper, in some things, has taken the cold meat of other authors and served it up warm and spiced to suit the palate; and as the cook deserves praise for rendering palatable that which otherwise would be left untouched, so also does our author for making readable that which we might not otherwise have looked at. A freshness and a charm are thrown around nursery proverbs and childhood sayings, which renew their youth and beauty. We read them as though we had read them not, and each successive perusal discovers some hitherto hidden and undiscovered beauty, some flowery nook before unobserved, some point in the perfect landscape that had hitherto escaped notice, and appeared the more beautiful on account of its sudden appearance. It is like studying a picture of one of the great masters; we are struck at first sight, because it is necessary. Every body admires great pictures, and therefore we admire them, though we can give no satisfactory reason for our admiration. After the charm of novelty wears off and we begin to look at it in its true light, the beauties do not burst upon us at once; one by one they start from the canvass and strike our senses. We are better pleased with each successive one, because it adds to our pleasure, and when, sitting and gazing for hours, we can take in every perfection at a single glance, the sensation is almost over-powering; we feel the presence of the master mind, whose impress the picture bears, and leave the gallery so full of a sense of beauty that we cannot shake it off. Like the image of the sun that flits before our eyes, if we have the presumption to gaze upon it, we see before us, for weeks, the striking features of the great picture whenever our minds are

unoccupied by other thoughts. As it is with the picture, so is it with Tupper; he must be studied to be appreciated. We may admire his work because the people say that it is a great book, but the delicate shades of perfection, the wide but well defined outline of character, the profound acquaintance with that mystery of mysteries, the human heart in all its labyrinthian workings, do not strike us until we have pondered and digested the work thoroughly, viewed it in every light, and scanned the proper, though sometimes hidden, meaning of every sentence. Another of Tupper's characteristics and virtues is his great simplicity and ease of expression. The merest tyro in the paths of learning, who scarcely knows how to tread her mazy windings, cannot mistake his way here. How can he possibly err, if he practice the principles therein enforced with so much of the "*suaviter in modo?*" How can he do otherwise than act the "*fortiter in re?*" In short, it is one of the books which Lamb says, *are books*, and we cordially recommend it to the attentive perusal of every admirer of the pure old Saxon, in which the writers of the golden age of English literature conveyed their opinions to the world.

"A spark is a molecule of matter, yet it may kindle the world;
Vast is the mighty ocean, but drops have made it roll."

ALPHA.

COMSTOCK'S PHONOLOGY.

A Treatise on Phonology; comprising a perfect alphabet of the English language, a system of vocal gymnastics, exercises in orthography, reading and declamation, and PITMAN'S *phonetic short-hand.*—By ANDREW COMSTOCK, M. D., Philadelphia, 1846.

We are pleased to find that the orthography of our language attracts increased attention from day to day. Since we first commenced the discussion of this subject in the Journal, we have become acquainted with at least half a dozen treatises upon the subject, most of which have appeared within the space of two or three years. In addition to this, the periodical literature of the day, from the Newspaper to the gravest Quarterly Review, discusses it in its various aspects with more or less of interest and ability. These are all encouraging facts, and satisfy us that this movement must go forward, and that it will not cease until our alphabet has been subjected to that reformation, the necessity of which is a matter of demonstration.

But whilst we rejoice in every indication of interest in this subject, we think it no less necessary to be upon our guard against all superfi-

cial and erroneous theories, and all premature and empirical attempts at reform. Every thing of this kind only retards and throws embarrassments in the way of the great work that the interests of literature and of humanity are here urging forward. The sifting process, through which every thing of this sort must pass before it can establish itself in the widely diffused commonwealth of English letters, will certainly and speedily detect its insufficiency, and this will always create more or less prejudice against all efforts in this direction.

In this light we are inclined to regard the work of Dr. Comstock, the title of which we have placed at the head of this article. From beginning to end, it displays marks of haste, and other still greater blemishes which admit of no excuse. His definition of the word "Phonology," which he uses to designate his science, is far from accurate, and his illustrations of his system wretchedly defective. "Phonology" he tells us "is the doctrine, or science of the *elementary* sounds of vocal language." There was no need of his coining a new word, as Pitman, whom he had before him, had already introduced the term "Phonetics," and very properly defined it as, "the science which treats of the different sounds of the human voice and their modifications." (Manual of Phonography, p. 19.

Perhaps, however, Dr. Comstock wishes by this word to vindicate his title to the authorship of this science? Such appears to be the implication in the following passages which stand upon p. 9.

In the preceding table each elementary sound is represented by a peculiar character. Hence, words spelled with these characters have no superfluous letters. Exercises of this kind were published in the author's Elocution, in 1830, and they have been republished in all subsequent editions.

This method of spelling with sounds, which was published by the author in 1830, has recently claimed attention in Europe, and has been successively applied in teaching the deaf and dumb to speak; and upon it Mr. Pitman, of England, has founded an excellent system of Phonography, the outlines of which are given in another part of this treatise.

A note refers to Hon. Horace Mann, as though his Report corroborated Dr. Comstock's claim. Now we have not seen this Report, but cannot for a moment believe, that Horace Mann intended to do or does any such thing. A correspondent of the Journal (Vol. II. 205, 208,) informs us that he has heard "the dumb speak" in Berlin, and very properly says that this cannot be done by *English* mutes, because our "language is not *phonographic*." But the German and various other European languages are so, or at least approximate to this character. It is "therefore amazing to hear Dr. Comstock speak of his system having been successfully applied in teaching the deaf and dumb to speak."

Still further, all that he here claims to have effected in his publication of 1830, had been effected at least substantially, a century before.

in *Sheridan's*, *Walker's* and other pronouncing dictionaries. But the plan which he now brings forward is entirely different from this, and is, we are bound to believe, derived almost entirely from PITMAN's "Phonography," to which he refers and of which he gives a very indifferent abstract. Nor can we see that he has either improved Pitman's phonotypic alphabet, or essentially modified it. The same objections, (so far as our recollection of Pitman's printed characters which we have not just now at hand), apply to them both. Some of the most obvious of them are the following:—

1. The existing distinction between capitals and small letters, which we regard as unnecessary, is retained.

2. New characters are introduced to represent sounds to which well known characters have been appropriated in nearly all European languages, such as the sounds of I, U, O, which have been perverted from their long established usage. So too J, is converted into an aspirated Z, as in *azure*.

3. The best characters have sometimes been unaccountably overlooked, as in the case of the Anglo-Saxon Ϸ, and which might so naturally have been employed to express the sound of *th* in *thin*, the Greek ϑ, being used to represent the sound of *th* in *that*.

Notwithstanding these and some other objections that we might state, we regard Mr. PITMAN's as essentially fulfilling all the conditions of a good phonographic alphabet.

We had intended to point out the errors into which Dr. Comstock falls in the application of this system, but want of space compels us to terminate our remarks thus abruptly.

COLLEGE RECORD.

The Examination.—The time for holding the *public* examination of the students of Pennsylvania College, having, by a resolution of the Board of Trustees, been changed from the end to the middle of the session, the week commencing with the 3d. ult., was devoted to that purpose. As this arrangement may not yet be known to many of our friends, and it may be interesting to them to be informed of the result of this its first trial, it is deemed proper to insert this notice in the Journal.

The following programm, which was previously published in several of the public papers of the vicinity, exhibits the order of subjects of the examination:—

Order of Examination.

Monday, Aug. 3.	The Preparatory Department was examined between the hours of 9 and 12 A. M., and 2 and 5, P. M.	
Tuesday, Aug. 4	9, A. M.	Soph.—Greek.
	10, A. M.	Fresh.—Latin.
	2, P. M.	Junior German Class.
	3, P. M.	Jun.—Evidences of Christianity.
	4, P. M.	Soph.—Algebra.
Wed'day, Aug. 5	9, A. M.	Fresh.—Greek.
	10, A. M.	Jun.—Latin.
	2, P. M.	Soph.—Plane and Spherical Trigonometry.
	3, P. M.	Jun.—Greek.
	4, P. M.	Soph.—Latin.
Thursday, Aug. 6.	9, A. M.	Fresh—History.
	10, A. M.	Jun.—Political Economy.
	3, P. M.	Soph.—Rhetoric and Greek of New Test.
	4, P. M.	Fresh.—Geometry.
Friday, Aug. 7.	9, A. M.	Jun.—Logic.
	10, A. M.	Soph.—Spherical Geometry and Calculus.
	2, P. M.	Senior German Class.
	3, P. M.	Fresh.—Mythology.
	4, P. M.	Jun.—Rhetoric.
Saturday, Aug. 8.	8, A. M.	Fresh.—Algebra.
	10, A. M.	Jun.—Mechanics or Optics.

The result was highly gratifying to the Faculty and such Trustees and strangers as attended. It is but justice to state that the students, in general, acquitted themselves in the most creditable manner. The examination was generally regarded as one of the best that has been held for a number of years in the Institution.

It will be seen that, according to this arrangement, there are to be but two examinations during the year, both public, one about the middle of each session, at each of which the students will be examined on all the studies which they shall have passed over since the last took place.

College Commencement. The Annual Commencement of Pennsylvania College will take place, on Thursday the 17th inst. The Baccalaureate address to the Senior Class will be delivered, by Pres. Krauth, on the Lord's day preceding. On Wednesday afternoon, the annual oration before the Literary Societies of the College will be pronounced by Rev. Dr. Cheever, of the city of New York. The Society of the Alumni will hold its anniversary meeting on the evening of the same day. The Orator of the current year is Rev. J. L. Schock, A. M. of Reading, Pa., a member of the graduating class of 1839.

On Tuesday evening the 15th inst., several addresses will be delivered by students of the Theological Seminary, and also a discourse be-

fore the Alumni of the Seminary, by Rev. Samuel Sprecher, A. M., of Chambersburg, Pa.

To Subscribers.—One number more will complete the second volume of the Record and Journal. We have during the past year, according to the best of our ability, endeavored to render it in every way worthy the patronage of our subscribers, and fully an equivalent for their subscription money, and we had hoped that they would, almost to a man, long ere this have forwarded to us that small sum ($1,00.) Quite a number have, however, we regret to state, neglected to do so, perhaps through forgetfulness; and some even owe us yet for the first volume, perhaps under the mistaken idea that it was sent them gratuitously.

In reference to the latter, if there be any, we would merely remark that the Association, being without funds, cannot do so without pecuniary loss; and in reference to all, that not only would we be *very much gratified of immediate payment of all dues* were made us, but also that *nothing more than a simple act of justice would be done.* We should then be able to meet our liabilities; otherwise we shall not, and we cannot believe that a generous public can permit an Association of young men, organized and laboring for such praiseworthy objects, crippled in their means, burdened with debt, and the continuation of this Journal thus endangered.

Bills will be sent by this number, to those who have not yet paid us; and those, who shall not promptly respond to this call, will be waited on soon by some of the active members or other friends of the Association, as we must have money to pay the printer.

We earnestly request those, who are friendly to the objects of this Association and desire it to prosper, to aid us in enlarging our subscription list with the names of reliable men. If, in addition to a reasonable number from the community at large, we had as subscribers all the Alumni and others who have preceded us as students of Pennsylvania College, we should be able, without increasing the cost, to enlarge the Journal and thus monthly furnish our readers with a greater amount and variety of matter. Let the effort be made.

To Correspondents.—We are sorry that the request of D. K. of L., came too late to enable us to make the change he desired. All communications should be in our possession by the middle, or at furthest the 20th of the month, if they are to appear in the next No. of the Journal.

The part of the Journal containing his communication had already left the press at the date of his last.

Pennsylvania Medical College,

Filbert above Eleventh street, Philadelphia.

Medical Faculty at Philadelphia.

WM. DARRACH, M. D.—*Prof. of Theory and Practice of Medicine.*
JOHN WILTBANK, M. D.—*Prof. of Obstetrics and Diseases of women and children.*
H. S. PATTERSON, M. D.—*Prof. of Materia Medica.*
WM. R. GRANT. M. D.—*Prof. of Anatomy and Physiology.*
D. GILBERT, M. D.—*Prof. of Principles and Practice of Surgery.*
W. L. ATLEE, M. D.—*Prof. of Medical Chemistry.*
W. T. BABB, M. D.—*Demonstrator of Anatomy.*

The Lectures will commence on Monday Nov. 2nd.

Acknowledgements of Donations to the Cabinet of the Linnæan Association of Pennsylvania College.

August, 1846. From *Rev. C. F. Heyer*, a large chest, containing curiosities from India, among which are two Tiger skins, Crania of Tigers, Herbivorous animals, Birds, &c. Antlers of an Elk; Head and antlers of the Antelope; Dried specimens of East India plants with seeds of different kinds; Shells; Cloth of Indian manufacture; Minerals, &c.

2. From Mr. *Jeremiah Culp*, $230 in continental money.
3. " *A. W. Lily*, Lead ore from Galena.
4. " *Mrs. Eichelberger*,, Relics from Washington's Tomb, Mt. Vernon.
5. " *Hon. Jas. Cooper*, Carb. of Lime incrusted with Carb. of Iron.

Receipts during August.

Mr. A. H. Snyder, North Liberty, Pa.	in full.
Rev. C. W. Schaeffer, Harrisburg,	"
" F. Springer, Springfield, Ill.	"
Mr. Wm. Walter, Cincinnati.	"
Edward C. Herrick, Esq. New Haven,	" for Vol. 3d.
C. J. Ehrehart, Gettysburg.	"
Daniel Garver, "	"
Franklin Chorpening, Gettysburg.	"

VOLUME II.] [NUMBER 12.

THE

LITERARY RECORD AND JOURNAL

Of the Linnaean Association of Pennsylvania College.

OCTOBER, 1846.

CONDUCTED

By a Committee of the Association.

CONTENTS.

1½ sheet, periodical—Postage, 2½ cents, to any distance within the Union.

NEINSTEDT, PRINTER, GETTYSBURG.

THE LITERARY

RECORD AND JOURNAL

OF THE LINNÆAN ASSOCIATION OF PENNSYLVANIA COLLEGE.

Vol. II. OCTOBER, 1846. No. 12.

PHILOSOPHY OF STORMS. NO. III.

BY PROF. WASHINGTON L. ATLEE, M. D. PHILADELPHIA, PA.

Although the earth is enveloped in a gaseous atmosphere, we are constantly surrounded by an ocean of steam. This steam, better known by the term aqueous vapor, is thrown into the atmosphere by various means, though principally by evaporation, its quantity varying yet not corresponding with the temperature of the air. The temperature may be the same, and the quantity of vapor may vary, for the air is not always in a state of saturation: sometimes, it is excessively dry, at others fully saturated, and again varies between these extremes. This variation in the hygrometrical condition of the atmosphere is intimately connected with the productions of storms.

I mentioned in my last number that as the air ascends it comes under less pressure and expands. Expansion in itself is a cooling process, and of course such an ascending current must continue to diminish in temperature. Apart from this, however, the temperature of the atmosphere varies with its elevation. The atmosphere, receiving its heat solely from the earth, its temperature becomes progressively lower, as the distance from the earth increases. Another circumstance, contributing to the same effect, is the increasing tenuity of the atmosphere; for the temperature of rarefied air is less raised by a given quantity of heat, than that of the same portion of air when compressed, owing to its specific heat being greater in the former state than in the latter. From the joint influence of both these causes it has been ascertained, by the researches of Gay Lussac, Humboldt, and others, that, in ascending into the atmosphere, the temperature diminishes at the rate of one degree for about every three hundred and fifty-two feet. The rate of decrease is probably much slower at considerable distances from the earth; but still there is no reason to doubt that the temperature continues to decrease with

the increasing elevation. This statement of the varying temperature of the atmosphere refers only to the mass in a quiescent state, uninfluenced by ascending columns, or by any variation in its hygrometric condition. These are modifying influences, which will be noticed hereafter. Now vapor is always condensible by a certain degree of cold, and as the vapor in the atmosphere must rise in company with the ascending column of air into regions that become colder and colder as it ascends, it must ultimately reach a point, if it continues to ascend, where the diminished temperature will condense it. This brings us to a point—*the formation of cloud*—which is at once the most beautiful and simple in the whole range of our subject, and which, aside from other concurrent phenomena, gives to the theory of Professor Espy, a pre-eminence over every other.

In illustrating the formation of cloud I would ask attention, for a moment, to a few facts that force themselves almost daily upon the observation of every one. On breathing upon glass, or other substance colder than the breath, moisture will be deposited upon it; the windows of crowded rooms, particularly in winter, become dripping wet in a short time; and a glass of sparkling water, cool from the fountain, *sweats* profusely in a hot summer's day. These results are produced by the condensation of the vapor in the air upon the colder bodies with which it comes in contact. The formation of dew, as explained by Dr. Wells in his excellent treatise on that subject, is a phenomenon of a similar character. Substances covered with dew are always colder than the contiguous strata of air, or than those bodies on which dew is not deposited. In fact, dew is a deposition of water previously existing in the air as vapor, and which loses its gaseous form only in consequence of being chilled by contact with colder bodies. Another not unusual occurrence of a like nature must, from its sudden and remarkable appearance, have attracted the attention of every observer. After the continuance of a cold spell of weather so as to cool the walls of buildings, the earth, and all bodies on its surface, there sometimes suddenly springs up a spell of warm weather accompanied with a southerly wind. Immediately the walls of stone buildings begin to *sweat*, stones, rocks, &c. become quite wet, and although no clouds are seen, yet every thing feels damp in consequence of the cold surfaces condensing the vapor of the warmer air. I might multiply such facts, but these are sufficient for illustration.

There are several circumstances, connected with these facts, which have an important bearing upon Professor Espy's theory. I shall, however, at present, ask attention to only two points, viz:—*That the atmos-*

phere contains vapor in a gaseous form; and that *whenever this vapor is cooled down to a certain degree below the temperature of the air, which contains it, it condenses into water.* It matters not where the cooling of this vapor is effected—whether it be accomplished by a cold glass, a cold wall, the cold earth, or by a colder region above us—the result will be the same, a *condensation of the vapor into water*, in the former instances producing *dew*, in the latter, *cloud.* The degree of cold necessary to condense the vapor in the air is variable and indeed always varying—still it is always the same at the same time in the same region. The *highest* temperature at which this vapor begins to be deposited at any one time is called the *dew-point.* Now if the dew-point be ascertained we at once know the degree of temperature at which the cloud, at that time, is formed; because, as before observed, vapor is condensed either into dew, or cloud by the same degree of cold. And if we bear in mind the scale by which the temperature of the atmosphere diminishes with its elevation, and comprehend the modifying influences hereafter to be noticed, we can calculate very accurately the *height* of the base of the cloud, as well as know the temperature at which that cloud is forming.

The simplicity of this part of the subject adds to its beauty and interest; and in my next number I shall dwell in detail upon the method of ascertaining the dew-point, the elevation and temperature at which clouds are formed, and the quantity of vapor contained in the atmosphere. Indeed, I hope to prove, during the progress of these essays, that the Laws of Storms stand as intimately related to meteorology, as gravitation does to the heavenly bodies, and that the whole subject is likely to be reduced as easily to calculation.

THE SMOKINESS OF INDIAN SUMMER, &c.

Although the design of the "Literary Record and Journal" would forbid the introduction of any thing which might savor of *personal* controversy, it is nevertheless regarded as an appropriate vehicle for the comparison of opinions on interesting scientific subjects. The Association, under whose superintendence this monthly is published, has for its principal object the eliciting of the truths and laws of the works of the Creator. And in no way are these truths better elicited and laws established, than by the collection of the observations and opinions of those who have given them their particular attention.

In the number of this Journal, for April, 1845, it was asserted, by

one of the contributors to its pages, that the obscuration of the sky during the Indian Summer, and at numerous other periods spread out over the whole year, was caused by *moisture* in the state of a *very thin cloud* resting on the earth, and not by *real smoke* agreeably to the prevailing opinion. For this assertion numerous reasons were assigned, which, to the writer, seemed satisfactory.

The correctness of the views advanced by him has, however, been called in question by a correspondent from St. Louis, Mo., an officer in the United States Army, and resident for some time on the western prairies. Under date of July 1st, 1846, he writes as follows: "I am decidedly of the opinion that the smoky appearance is occasioned by the burning of the prairies, which, you will recollect, embrace some thousands of square miles in this western world. In the fall, through the winter, (when the snow happens to be light,) and in the spring, fires are raging on these immense tracts, which occasion a smoke so dense that I have sometimes found myself unable to see two hundred yards so as to distinguish an object as large as a house. This smoke, being carried eastward, occasions that *haze* which, if it happen to coincide with a period of calm weather, is called *Indian Summer.*"

Upon these statements, several remarks may be made, showing the insufficiency of his explanation of the phenomenon in question.

1. As he does not dissent from the main point maintained in the 1st Vol. of the Journal, viz: *that the Indian Summer and other seasons of smoky weather occur during a comparatively quiet state of the atmosphere*, his theory can only apply when the existence of the fires on the prairies, and this condition of the atmosphere "happen to coincide." But the fires are evidently accidental and irregular, whilst the smokiness is regular, and always accompanies a comparative rest in the air for several days together. The smoke from the burning of the prairies would produce obscurity in *all conditions* of the atmosphere, and could but add *intensity* to the obscurity due to another course. It is readily granted that extensive fires raging in the west at the time of the Indiam Summer would distinguish it as eminently smoky.

2. But his theory does not, by any means, explain that oft-recurring phenomenon—a smoky sky immediately after long-continued and drenching rains over the whole country, when nothing combustible remains in prairie or forest. In June last, for example, near its close, and a few days after the reception of his letter, the atmosphere was very smoky for three or four days, notwithstanding that nearly the whole United States territory had just been drenched with copious rains, and it would have been next to impossible to kindle a fire on the prairies. The last

four days of June and the first six of July were so wet that the farmers in several of the Middle States were apprehensive of losing their wheat crop, and it was said that, at the same time, there was by no means a deficiency of rain in the valley of the Mississippi; and yet several days of smoke immediately succeeded. The same happened towards the close of the same month. Indeed during every month in the year, the conclusion is warranted that, in general, the smoke of the atmosphere has no dependence whatever upon the existence of fires, but upon the quantity of moisture and the comparative equilibrium of disturbing causes.

LUNAR INFLUENCES.

From the earliest ages, popular opinion has assigned to our satellite a powerful influence upon the physical condition of planets and animals, and a large class of natural phenomena has been supposed to be subjected to its control. Its imputed power is not confined to organic effects, it notoriously governs mental derangement, and affects to a great extent the healthful performance of the vital functions.

These opinions have not been confined to particular ages or countries, but have been universally prevalent; and even at the present day, nothing is more common than to find persons sustaining a high reputation for intelligence, in other respects, who are firm believers in many of the most absurd of the lunar fallacies.

That the Moon does exert an influence upon our planet, and that it is the cause of several phenomena, no one who is at all acquainted with the laws of gravitation will be disposed to deny: but independently of its attraction, we can discover no cause of influence, at least none that is sufficient to account for the effects that have been attributed to it.

It is well known that aqueous and aerial tides, the precession of the equinoxes, and the nutation of the Earth's axis are caused by the attraction of the Moon, and it is barely possible that it may in some way exert an influence upon the delicately constructed and exceedingly sensible nervous system. That it does not exert such an influence is not easily susceptible of direct proof, but it is even more difficult to show that the affirmative of the question is true. No observations, that have ever been made with sufficient care to be relied upon, give the least encouragement for such an opinion. The celebrated discoverer of the planets Pallas and Vesta, Dr. Olbers of Bremen, states that in the course of a long medical practice, during which he directed his attention particularly to the subject, he could not discover the slightest trace of any con-

nection between the phenomena of disease and the phases of the moon.

None of the known laws of nature have as yet been able to explain why the moon should influence the movement of the sap in plants, the durability of a roof shingled in a particular phase, the time of felling timber, and a thousand other things which are commonly received as facts. Popular opinion has invested our little satellite with almost unlimited power and the most extraordinary and opposite effects are attributed to its influence. It does not follow, however, that that which is generally believed must necessarily be true, and if the foundation on which these opinions rest, be very slightly examined it will be found that few of them are even apparently sustained by facts.

Rejecting the more absurd and ridiculous superstitions which are and have long been prevalent, and directing our attention to an opinion which has the greatest appearance of plausibility, let us inquire whether the phases of the moon are accompanied by any change in the condition of the atmosphere, or if such changes are more prevalent at those periods than at others? To settle this question it would be obviously useless to take the opinions of any number of individuals based merely upon ordinary observation. Our prejudices are so strong, that without intending to deceive ourselves or others, those appearances which help to confirm our peculiar views are remembered, whilst those which are opposed to them are suffered to pass unnoticed. The question can only be settled by a long series of instrumental meteorological observations, and by comparing the results for a number of years. This has been done by M. Schübler, and the results, re-examined by M. Arago, render it probable that there is but little correspondence between these two classes of phenomena; that any other epoch, besides the new and full moon or any particular phase, would exhibit as great a variety of changes; and that if any influence is exerted by the moon at the period of the lunar phases tending to produce changes of weather, it is so combined with other causes of disturbance as to be almost, perhaps altogether, inappreciable.

Effects sometimes attributed to the moon are due solely to the condition of the atmosphere in respect to the quantity of vapor which it contains. When the moon shines brightly it is an evidence of the absence of clouds, and consequently the heat radiated from objects on the earth's surface, not being returned by reflection, is lost, and the temperature of the radiating objects is reduced. From this cause buds and young shoots have been sometimes frozen under a clear sky, when they would have been saved by the presence of clouds. Here an effect, which

has generally been attributed to the blighting influence of the lunar rays, may be accounted for by a very simple physical cause, having no connection whatever with that which has been assigned.*

Another opinion is that timber should be felled only at particular periods of the lunar phases, and that, if this rule be not attended to, its durability will be greatly impaired. The difficulty of tracing any connection between the effect and its supposed cause is still greater here than in the former case. The lunar rays have not power to affect the most delicate instruments: even when concentrated by the parabolic mirror and reflected upon the bulb of a differential thermometer, they produce not the slightest effect. But before wasting time in the attempt to assign reasons, let us again inquire: Is the fact established? Popular prejudice is certainly in favor of it, but this proves nothing. Experiment alone can decide it, and this test has been applied. M. Duhamel Monceau, a French agriculturalist, has proved that the qualities of timber, felled at different periods of the lunar month, are the same, and that trees of the same age, similar exposure, and growing on the same soil exhibit no difference in durability.

It is unnecessary to analyze these fallacies to a greater extent. Opinions based upon a few isolated facts or observations are worthy of no credence, yet hasty and general conclusions have often been deduced from them, tenaciously retained, implicitly believed, and even transmitted to succeeding generations without an attempt to ascertain their truth. Nothing but a series of carefully conducted observations or experiments can be relied upon, for the confirmation of any opinions connected with lunar influences; and wherever this test has been applied the popular belief has been shown to be erroneous.

* Our readers will, no doubt, wonder why, if the belief in lunar influence is to be regarded as a popular prejudice, our correspondent did not assign some other reason for the occurrence of frosts late in spring and early in autumn, so uniformly at about the times of new and full moon, as to have given rise to that belief. They will think it singular, that the atmosphere should happen, just at those times, to be more destitute of moisture and thus favor radiation and the production of cold than at others. The persuasion, so summarily condemned as unfounded and erroneous, is but the result of the common sense of mankind strongly impressed by the events of each year—a deduction from the accumulated observations made through a succession of ages; so that it would be about as easy to persuade our readers that the day had no more than an accidental connection with the sun, as upon the authority of MM. Shübler and Arago, to convince them that certain atmospheric changes, usually ascribed to lunar influence, "have no connection whatever with the cause which has been assigned."—Ed.

THE GREAT AMERICAN ELECTRIC-TELEGRAPH.

Every one has, no doubt, read or heard of this greatest wonder of our age. There is scarcely a newspaper or public journal published in

our land, which has not contained notices of it more or less extended. We doubt not but that some of our readers may have wished to see a more detailed account of the principles of its construction and the mode of its operation. This we shall, at the solicitation of a friend, endeavor to do, after a few preliminary observations. How we shall succeed, we will leave others to judge.

Since the Spring of 1844, when an experimental line of forty miles, between Washington city and Baltimore, was made, the telegraph has been extended along the sea-board from the former place as far as to Boston, and from New York city, through Albany to Buffalo, on Lake Erie. Other shorter branches have been extended in various directions into the country, and yet others are in contemplation; so that probably, in less than a year, our whole country will be threaded over by it, and intelligence communicated almost instantaneously to points the most remote, as well as to those which are intermediate. Upwards of one thousand miles, if we are not mistaken, are already completed.

The Electric-Telegraph of Prof. Morse, both on account of the simplicity of its construction, and the gigantic scale upon which it may be made to operate, must be regarded as one of the greatest triumphs of inventive genius. And as its inventor is one of our countrymen, we take no little pride in designating it the "Great American Electric-Telegraph." Other forms of the electric-telegraph there are, differing from this, principally in the mode of applying Magnetism, the power employed, and of recording or evidencing the information to be communicated. The principal of these are those of Wheatstone of England, and Bain of France. But so great is the superiority over all others of that of Professor Morse, who has also the honor of being an original inventor, not an imitator or an improver, that his instrument has been adopted, not only in the United States, but also in Germany and France, and it is not doubted but that before long England will so far forego her partiality to the less perfect invention of her *son*, as to adopt the more perfect one of her *grandson*. A comparison of the operation of the three telegraphs shows that the American gives "sixty signs or characters, the English fifteen, and the French at most fourteen per minute; with the advantages in favor of the first, that the characters are made permanent, and the operation of the instrument surer; the simplicity of the machinery rendering it less liable to be deranged by atmospheric changes or other incidents."

As the operative principal in this telegraph is Magnetism as produced by a transmitted current of electricity, and the construction and operation of the instrument are based upon an easy and simple application of

the facts and laws of Electro-Magnetism previously known, it may, perhaps, be most interesting to our readers to explain these in the historical order of their developement or discovery.

In 1790, Galvani made the discovery of the developement of electricity by the contact of two different metals and a moist substance with each other; and, soon after, Volta, taking this discovery and following up the train of his own reasoning, constructed his *pile*, by which a continued current of electricity was brought under the power of the operator. The *pile* of Volta, as modified and improved by others, has been called indifferently the *Galvanic and Voltaic battery.* This differs, as a source of electricity, from the ordinary electrical machine principally in this respect, that it affords to the operator a continued *stream* of electricity capable of being put in motion or stopped at will, which cannot be effected with the latter, except with the utmost difficulty and for a very short time. As this is the generator of the power applied, it will be described in the form used in the working of the telegraph. From three to five glass tumblers, about three inches high and two inches and three quarters in diameter, constitute the containing vessels. Into each of these is placed a piece of the purest zinc, bent or cast so as just to go into it and of the same height; within this is placed a cup, an inch and a quarter in diameter, of earthen ware, baked without being *glazed*, so that moisture can *soak* but not *leak* through it; and in the inside of this is placed a plate of platinum of the height of the cup and about as thick as tinfoil. These cups, which may be numbered 1, 2, 3, 4, &c., are arranged close to each other; and the zinc of No. 1, connected with the platinum of No. 2, by a metallic strap soldered to each; the zinc of No. 2, is similarly connected with the platinum of No. 3. &c.; and the zinc of the last is made to communicate with the platinum of No. 1, by means of a wire. This wire may be of any length desirable, from one inch to thousands of miles, provided it is well joined to the extreme metals. Instead of using but one fluid to act upon the two metals, as in the experiments of Volta, it has been found that the best and most enduring effect is produced, when the porous earthen cup containing the platinum is filled to within one quarter of an inch of the top with pure nitric acid, and the part of the tumbler, in which the zinc is, to the same height with sulphuric acid diluted with twelve parts of water. The electricity passes from the zinc in each tumbler to the platinum in the same, thence through the strap of metal to the zinc of the next, &c., and at last from the last platinum through the wire round again to the first zinc, constituting a circuit through which it is irremittedly flowing when the battery is in action. The electricity, whilst flowing through

the wire between the extremities of the battery, generates the magnetism which operates the telegraph, in a manner presently to be explained. This form of battery, called Grove's battery, will operate without much diminution of power for several days together.

In 1819, Professor Oersted of Copenhagen discovered that an electical current acted upon a delicately suspended magnet, causing it to assume a position at right angles to the current.

Not long after this discovery, Ampère noticed that, when two electric currents passed in the same direction through two adjacent and parallel wires, these wires attracted each other. This proved that electric conductors are magnetic or have the property of magnetism, whilst transmitting a current.

From this discovery very naturally resulted that of Arago and Davy. These gentlemen, about the same time and independently of each other, discovered that permanent magnetism is communicated to a rod of steel by an electric current flowing at right angles to it. If the conducting wire be covered with silk, cotton thread, varnish, or other non-conducting or insulating substance, so as to prevent contact, and wound from one end to the other on a rod of any hard substance, so as to form a hollow cylinder when the rod is withdrawn, and if the rod of steel be now placed within, it is found to have received a magnetism increased in proportion to the number of turns of the wire; for this arrangement is equivalent to causing as many electric currents, as there are turns of the wire, to flow at right angles to the rod. If a rod of *soft iron* be substituted for the steel, it is found to acquire a much stronger magnetism, *whilst under the influence of the electric current, but to lose it as soon as it is withdrawn from the hollow cylinder or the current ceases to flow.* The soft iron whilst magnetic is called an electro-magnet, and the temporary property acquired electro-magnetism.

Previously to this, it was known that a steel magnet, when bent in the form of a U and furnished with a soft iron armature, was capable of exerting a greater attractive influence, than when in the form of a straight bar. Following out these hints Professor Moll formed a U of soft iron, and wound it with insulated copper wire. He found that the soft iron possessed the most surprising magnetic properties whilst under the influence of the electric current.

The first successful attempt to measure the magnetic power, thus capable of being developed, was made by Professor Henry, then of Albany, N. Y., and now of Nassau Hall College. With a bar of soft iron, two inches in diameter, bent in the form of a U and wrapped with 180 yards of well insulated copper wire, No. 18, he obtained a power equal

to 145 lbs., but when the wire was divided into nine separate parts of twenty yards each, and separately wound on the U, the electric current flowing through all simultaneously, he obtained a power equal to 750 lbs. This proved the possibility of making electro-magnets of almost any desirable power. They have since been constructed so as, even with a small battery surface, to sustain several thousand pounds weight. The *mass* of the conductor appears to be more important than the *length*.

The knowledge of these facts, together with the additional one, that the electric current passes, not only with inconceivable rapidity, but also almost unimpaired through even the longest conductors, suggested to Professor Morse, on a homeward voyage from Europe, in October, 1832, the sublime idea of constructing an instrument which was to annihilate both time and space by conveying intelligence by means of electricity. The result was the invention, and after some modification and improvement, the perfection of the American Electric-Telegraph. Those alone, who are acquainted with the cumbersome and comparatively slow method of signal telegraphs previously in use, can form a tolerably correct idea of the elegance and importance of such an invention.

The battery and magnet, upon which the action of the instrument depends, being described in a general way, it becomes necessary to take up several points in detail.

If, when a U of soft iron is wound with an insulated copper wire whose two ends are made to communicate with the extreme metals or poles of the battery, an electric current is made to flow through it round the U it renders it strongly magnetic. It matters not how distant the battery is from the soft iron, so that only there is a good connection between them, such as is afforded by two continuous wires well insulated from each other, or by one insulated wire and the mass of the earth &c. If, for instance, the battery were at Washington and the magnet at Boston, and a wire extended from the former to the latter and another from the latter to the former, upon making the necessary connections, the battery at W. would instantaneously render the soft iron at B. magnetic. The same would take place if an insulated wire from one end of the battery alone extended from W. to B., provided that at the same time the other end of the battery, as also the free end of the wire enclosing the U, communicated with the earth: for it has been ascertained that, as the conducting power of bodies increases with their mass, a large conductor will compensate for a feeble conducting power. It is thus that the interposed mass of earth, being of the same length as the wire, becomes even a better conductor in consequence of its great mass; and it is upon this principle that *thick* iron wires can be substituted for copper, altho'

of inferior conducting power. The thick iron wires, being stronger and less liable to be broken, are about to take the place of copper on some of the telegraphic lines. For conveying intelligence both ways there must be an electro-magnet at each end of the line, although one battery is sufficient. One battery is even sufficient to operate two *independent circuits*, by which communications can be sent both ways, at the same time. For this purpose it is only necessary to have two wires, the ground being used in common with them. In this case the electricity divides itself between the two wires into two currents, rendering the U's at each end magnetic, and returning through the ground to the battery.

When no intelligence is to be conveyed the wire is not in close connection with the battery, but with a spring key. The connection with the battery and the transmission of the current is secured by pressing down the free end of the key until it touches a knob in connection with the battery, and as long as the contact is continued the current flows. As soon as the operator removes the pressure of his finger, the key rises, contact is broken, and the current ceases to flow. Thus a current and consequently magnetism of longer or shorter duration may be secured according to the will of the operator.

As soon as the connection is formed by the operator at one end of the line, by pressing down his key, the U at the other end becomes magnetic, and attracts down to it a piece of soft iron, stretching from side to side and distant from it about one-eighth to one-tenth of an inch. This soft iron, called the armature or keeper, is attached to one end of a lever, which it brings down, whilst the other end, which is furnished on its upper surface with a blunt steel point called the pen, is by the same motion forced upwards. Directly opposite the pen is a small groove in a small cylinder placed above it. Between this cylinder and the pen a ribbon of strong paper is drawn, by a kind of clock work, which is put in motion as soon as the U becomes magnetic. When therefore the pen is forced upwards it indents the paper by pressing it into the groove, and makes a mark, without tearing, according to the length of time during which the operator at the other end holds down his key. If he immediately lets it rise, the pen makes a dot, if he holds it down longer, it will make a line, &c. In this way lines or dots or their combination may be made at pleasure.

The great superiority of Prof. Morse's telegraph consists mainly in the simplicity of his alphabet and the ease with which the characters are recorded. His alphabet, which he also invented on his homeward passage, consists of dots and lines and their combination, and is admira-

bly adapted to his instrument. Take as an example, the following message, which was actually conveyed:

Y o u r g r a t i f y

i n g i n t e l l i g e n c e

i s a t h a n d, a l l s a f e.

Y o u r s, W. L o c k e r.

If two individuals wish to hold a secret correspondence, so that even the operator may not understand it, they may agree that these characters shall have a different signification, or make some other combinations of points and lines.

Wheatstone's telegraph is so constructed, that an index is made to point to the letter intended to be written or marked, and if there be no one present to make a record of it, or if the attendant is not attentive, the message is lost. Not so with Morse's; that records even when no one is present to observe its motions.

INCIDENTS IN ENTOMOLOGY.

Extract of a Letter to a member of the editing Committee.

Were I still with you I should learn much by comparing notes of observations of the doings of insects, of which I have always been inclined to take notice, though not with the scientific eyes of a Linnæan—and on Sunday week last, (the 23d ult.), I had an opportunity of watching the process, which seems to have astonished Huber so much—the female ants divesting themselves of their wings. There was no small commotion about the nest to which I suppose they belonged: they settled in considerable numbers about the tops of the tall grass, and deliberately proceeded with the dismemberment. This sight is probably familiar with the writer of Ant-iana; but I confess it was new to me, tho' I have often watched ants with great interest; and I am the more particular in mentioning the day, because, so far as my experience has extended, insects are great observers of times and seasons, and I should look with confidence for a repetition of the phenomenon at the same period of the year.

And while I am on this Linnæan subject, I should like to draw your attention to a curious appearance on the web of a large species of garden spider. It is one of those with perpendicular concentric webs, and rests in the centre with its head downwards. With its legs

extended it must measure considerably more than two inches. It is brown, beautifully marked with yellow, but I cannot pretend to determine its species; for I am not entomologist enough to kill it without compunction, and I cannot see the arrangement of its eyes. This may be sufficient to enable some of your members to recognize it; and the appearance to which I allude, I know not how to describe better than to say it exactly resembles what the ladies call "herring-bone stitch," extending about six inches perpendicularly through the centre of the web—its object I presume is to mask the owner of the web, for he takes his position behind it. It is formed I doubt not of the same materials as the web itself, but probably from being thicker it looks much whiter and more like silk. This also may be familiar to you; but I do not remember to have seen it before, and it assuredly is not accidental; for I find it on three different webs of the same species of spider.

THIRLWALL'S GREECE.

"*History of Greece. By the Right Rev. Connoss Thirlwall, Lord Bishop of St. David's.*" 2 *Vols. Harpers' edition.*

Greece, the former home of philosophy and song, consecrated as the cradle of learning, refinement and liberty, is a spot which awakens in the breast of the classical student the most interesting associations. Any thing connected with the land in which Homer sang and Plato reasoned, where Æschylus charmed his hearers and Demosthenes spoke in strains of resistless eloquence, which

> "Shook the arsenal and fulmin'd over Greece,
> To Macedon and Artaxerxes throne,"

cannot fail to secure and elicit our sympathy. This interesting country has afforded material for the historic pen of some most gifted writers, yet of all these we know of none that can compare with the work of Bishop Thirlwall. The eagerness with which it has every where been read is a sufficient testimony of the popularity of the author. It has already passed through several editions and has received the general suffrage of England and the Continent. The American edition is from the press of the Messrs. Harpers, occupying two large octavo volumes. The work is a learned, elaborate and ingenious view of ancient Greece. The author does not give the result of his researches in a simple statement, but takes the reader in a manner over the ground, he himself has traveled, before he arrived at his conclusions. To many, some of his expositions may appear heavy, but all are valuable; if any were omitted

it would envelop subsequent statements in darkness. Many of the discussions may seem minute, but this from the nature of the undertaking could not have been avoided. The chief excellencies of the work are its freedom from all party bias and monarchical predilections; the enthusiastic love which the author evinces for his subject; extensive erudition, sound judgment, and wise political reflections. The ideas are presented with clearness and fluency, and with that ease which arises from a thorough grasp of the subject. The style is animated, simple and natural, and in some passages there is much life and vigor. The work contains a series of brilliant pictures—a most beautiful grouping, as for example, in the story of the attempts at Reform in Lacedæmon under the ill-fated, amiable Agis and the high spirited Cleomenes.

The author has not only had recourse to the original classic writers, but he shows a familiar acquaintance with the learned researches of the laborious Germans. He commences with speculations as to the early inhabitants of Greece and the foreign settlers, and presents inquiries as to the origin of the Hellenic people, and the persons and exploits of the heroic ages, endeavors to give consistency to the return of the Heraclidæ and probability to the legislation of Lycurgus. He also furnishes us with the physical aspect of Greece—with an interesting view of the political and social condition of the Greeks, during the heroic age, and an able account of their national institutions and forms of government.

Did our limits allow, we should be glad to give an analysis of the whole work and follow the author in his narrative. Our design in this notice is merely to direct attention to the interesting and instructive publication and recommend its careful perusal to our readers.

EPISTLES TO STUDENTS. NO. II.

Young Gentlemen:

We undertook to convince you, if conviction were needed, that you have assumed, and not by constraint, but willingly, vows, which are neither oppressive, nor arbitrary. We touched upon the first part of your matriculation oath. You cannot seriously object to rendering your instructors respect. When the obligation is extended beyond them to other men, whose relations to you are general, the obligation may not be so clear, but there cannot be any real difficulty in determining that the requisition, so far as they are concerned, is proper. It would neither comport with your dignity as gentlemen, nor with your connection with a respectable literary institution, that you should be charge-

able with disrespectful conduct towards your fellow-citizens. The buoyancy and levity of youth, occasionally, prompt indiscretions and rudeness in intercourse with men, which social refinement and correct principles of conduct would condemn. For ready are young men, ofttimes to underate the worth of them, with whom they are placed in contact, and to insult and mortify them in violation of all proper rules of action. To guard against this, whilst it is becoming in any condition of life, prescribed in every well regulated household, and performed by all whose domestic education has been sound and effective, is the design of the marticulation clause to which we refer. It is insisted upon in the case of the student, because he is prone to consider himself as occupying a very unique position, and as released from the general obligations of men. He concedes things to be right and indispensible under ordinary circumstances which he does not feel bound to practice whilst under academic training. The sentiments which are appropriate for the gentleman, ought never to be laid aside; they should be engrained in his nature, and should influence him, every where, at home and abroad.

Another item in this formula is expressed in the language: "I solemnly promise, on my truth and honor, that I will abstain from the profanation of the Lord's day." The great Law-giver of the Universe has said in his word: "Remember the Sabbath day to keep it holy, six days shalt thou labour, and do all thy work: but the seventh day is the Sabbath of the Lord thy God: in it thou shalt not do any work, thou, nor thy son, nor thy daughter, thy man servant, nor thy maid servant, nor thy cattle, nor thy stranger that is within thy gates: for in six days the Lord made heaven and earth, the sea and all that in them is, and rested the seventh day: wherefore the Lord blessed the Sabbath day and hallowed it." This is the law of the Sabbath, binding upon men at all times, and under all circumstances. We will not discuss the moral character of the command, and we deem it unnecessary to attempt the proof of its perpetuity.

Occupying the general ground, that the day was made for man, and that the purposes, which it subserved originally, it still subserves in a pre-eminent degree: in a word, that it has been and is unspeakably useful to man, both in body and soul, its proper consecration is claimed at your hands. The assumption of this part of your duty or the recognition of the propriety of it, pressed upon you by the word of God, and in the institutions of that religion under which you live, cannot be considered by you in any other light than as becoming and right. You have separated yourselves for a season from parents and friends, you have left the scenes of your childhood and youth, to sojourn during a

brief but most interesting period of your life, when you expect, and your friends expect that you will enjoy important facilities for intellectual and moral training. In your father's house, you were habituated to the observance of the Lord's day. You abstained from your ordinary pursuits, your ordinary studies, your ordinary reading. You went to the house of God and heard his holy word. Quiet reigned in the household, and cleanliness and order pervaded every part of it. In entering upon a collegiate life, you become members of another family, and the law of the Sabbath prevails in it. Your father's and mother's lessons are not to be unlearned; the sacred day is not to become profane; but it is to return to you with its rest, its subduing influence, and its purifying power. With this arrangement, you cannot find fault. It commends itself to your head and heart. We will not write more on this subject now, for it will recur again. Our present purpose is merely to shew that the requisition of your college in this respect has the highest authority and the strongest claims, and therefore you cannot with reason object to it. Yours.

COLLEGE RECORD.—COMMENCEMENT-WEEK.

Another era in the history of our town has occurred, one not soon to be forgotten. Commencement-week, with its interesting exercises and stirring incidents, now takes its place among the records of the past. Around its memory will cluster many pleasant thoughts, and with their awakening, come emotions and associations fraught with no ordinary gratification. Anticipations were fully realized in the rich treat afforded by the various exercises connected with the institutions in our midst. The attendance of strangers was large, beyond prophecy: it was such as most highly to gratify those who cherish a deep interest in the prosperity of our Literary and Theological Institutions. Public attention seems to be more fully than ever before excited, in behalf of these seats of learning and virtue, and popular enthusiasm is setting in to them, with a fuller and deeper tide; giving to the officers and patrons of the Institutions and to all lovers of intelligence, an earnest of a rich and glorious future. With permission of the editor, a citizen would present, in brief detail, the most attractive public incidents of Commencement-week, to those readers of the Journal, who have been precluded the gratification of mingling in the exercises of the occasion—scenes we propose to pass in review.

Alumni of the Seminary.—The exercises, opened on Tuesday evening, with a rich moral and intellectual treat, presented on part of the

Theological Seminary, to an unusual assemblage of citizens and strangers. An interesting address was delivered by Alexander Bosserman, a young gentleman connected with the Theological School, during the past year—his theme, "Eternity." Several other young gentlemen were prevented, by illness and other obstacles, from participating in the performances. *Rev. S. Sprecher*, an alumnus, delivered a discourse, taking as his theme: "*The true stand-point of the Christian minister.*" The variety and beauty, and boldness of thought, usually characteristic of his productions, highly gratified, and held for a long time, the attention of a large and intelligent auditory. The excellent choir of Christ's church enlivened the intervals with anthems and sacred melodies.

College Alumni.—Second in the series of public exercises, came the annual meeting of the Alumni of Pennsylvania College, on Wednesday—an occasion fraught with grateful and peculiar interest to the many sons of the Institution, whose hearts turn to their Alma Mater, true as the eye of the pilgrim to his cynosure star. The Rev. J. L. Schock appeared upon the stage, as the orator elect for the occasion; and in elevation and maturity of thought, in purity and strength of diction, and in pleasing and impressive oratory, fully realized the ideal of his production conceived by the many old admirers of his justly popular efforts, during his College days. His theme—"The sources of errors in opinion"—evinced calm and resolute judgment in its selection. Though not of a popular cast, or at least not of the modern *ad captandum* tribe, yet doubtless to most in the crowded hall the felicitous manner of its treatment precluded the perception of the difficulty of clothing a theme so abstract, and purely rational, with a popular and attractive garb. In this, the speaker triumphed most happily over the seeming rigidness of his topic.

No small portion of the pleasurable emotions of the evening was excited by the occasional rich burst of harmonious sounds, vocal and instrumental, discoursed by the members of the Haydn Musical Association. After the delivery of the Oration, the Alumni Association organized for the transaction of its usual business. *Rev. Jno. Heck* presiding, and *Prof. M. L. Stoever* officiating as Secretary. The full attendance of members was gratifying to the true sons of their Alma Mater, and the warm clasp of the hand in friendly recognition and gratulation, and the commingling of old familiar voices sent home the heart's flood with quicker pulsations in the bosoms of old class-mates, college-chumbs and fellow-graduates, crowding around a shrine heaped with the warm offerings of full hearts. Alexander R. Stevenson, Esq., was chosen to deliver the annual alumni address in 1847,—Wm. B. M'Clellan, Esq., to be his alternate—both fellow-townsmen.

Annual Address.—Circumstances beyond his control, prevented the presence of Rev. Dr. Cheever, of New York, the eminent gentleman selected to deliver the Annual Oration before the Literary Societies of the College. So high and so sanguine were the anticipations of the popular mind, that the disappointment was no ordinary one, and would have been still more deeply felt, had it not been for the grateful relief furnished in the high interest of the other exercises of the week.

Commencement.—Thursday morning ushered in, the great event of the week. At 9 o'clock Christ's church was thronged with a crowd, where mingled youth and manhood and old age, the beautiful, the intelligent, the manly, and the venerable; all eager to secure an audience of the approaching exercises. And as the morning advanced, and one after another of the performers came forth, flushed with hope, yet doubting of success, and retired with the grateful boon of the silent applause of a thousand faces eloquent of pleasure, others, and yet others came crowding until there was no more room for them. But to the exercizes.—Prayer for the blessing of heaven, was offered up by Rev. Prof. Smith, of Hartwick, formerly a Professor of this Institution. The members of the graduating class then successively appeared in the different performances allotted them. A Latin salutary was delivered by Wm. Baum, of Reading; a Greek oration, by John A. Houck, of Gettysburg; a German oration by A. C. Wedekind, of York, Pa. These performances, in the accuracy of their preparation, and in their distinct, animated and appropriate enunciation, merited and gained for the young gentlemen high commendation. Orations, were delivered by Chas. A. Brougher, of Miss. —subject, "Oliver Cromwell;" J. G. Martz, of Frederick Co. Md.—subject, "the Connexions of the physical sciences;" Chas. Keyser, of Baltimore—theme, "Enthusiasm;" Wm. H. Stevenson, of Gettysburg—subject, "Fall of the Roman Empire;" J. P. Smeltzer, of Carroll Co. Md.—theme, "The Influence of the English Language;" J. Edward Herbst, of Gettysburg—subject, "American Orators;" and H. C. Eckert, of Adams Co.—subject, "Curiosity." Between the merits of the orators, it would be invidious here to discriminate. All their efforts were praiseworthy, exhibiting a diversity of talents, taste and power. They furnished a literary entertainment, pleasing in variety, felicitous in the presentation, and rich in thought and imagery,—in fine, characterized by a high order of excellence. After the conferring of the Degrees, the Valedictory was pronounced by J. Marshall Clement, of North Carolina. Chaste, polished and elevated, in thought and diction; and earnest and heart-felt in delivery, few were they but felt the eloquent sentiments of the "farewell words" stirring within them the

pleasing, though sad emotions, which it was the province of the speaker to awaken. The Degree of A. B. was conferred upon the members of the graduating class, 13 in number.—The Degree of A. M. in course, upon Daniel H. Bittle, David A. Buehler, Rev. John E. Graeff, Rev. William H. Harrison, Charles Horner, M. D., Rev. Lloyd Knight, Rev. William A. Kopp, William M. Paxton, John A. Reidenauer, M. D., Rev. John E. Rugan, and Alfred H. Smith, Esq.

The Baccalaureate Address had been pronounced, to the graduating class and a large audience, by President Krauth, in Christ's Church on the preceding Sabbath. Its great aim was to urge upon the young gentlemen, "*to be the servants of no man*"—to cherish a high and noble independence of character—to be men—to be good and true men. The discourse was nervous, cogent and practical.

The Music.—Not only was there a feast of intellect spread for us; but full, rich gushes of melody, rapturing the heart, filled the intervals between the Orations, during the exercises of commencement. We could almost feel our souls

"lapt into Elysium,"

under the spell of harmonious ravishing tones of voice and instrument. We can but poorly express the eloquent tributes of many hearts, spontaneously poured upon the members of the Haydn Musical Association, whilst swayed and held captive by the bright chains of song which they wove around us. The highest and best compliments of the season to them, and we make our bow.

A CITIZEN.

THE ALUMNI ASSOCIATION.

At the annual meeting of the Alumni Association, the following individuals were elected officers for the ensuing year:

President, Rev. E. Keller, D. D., of Ohio.

Vice Presidents, Rev. W. H. Smith, of Maryland, Hon. M. G. Dale, of Indiana, Rev. Geo. Diehl, of Pennsylvania, Rev. J. R. Keiser, of New Jersey, Dr. C. L. Baker, of Pennsylvania, Rev. Jas. C. Brown, of Va.

Secretary, Prof. M. L. Stover.

Treasurer, Mr. William Ruthrauff.

The Orator selected to address the Association at its next Anniversary is Alexander R. Stevenson, Esq. of Gettysburg, Pennsylvania.

Corrections. Vol. I, p. 121, 5th line from the top, for "seventy-eight"—read "twenty-eight."

Same page, 21st line from the top, for "56,240,000,000"—read "56,240,000,000,000."

Vol. II, p. 130, for "28,000,000"—read "38,000,000."

Same page, 8th line from the bottom, for "are"—read "are turned."

Page 131, 18th line from the top, for "axis"—read "axes."

Page 250, last line, for "appearance"—read "approach."

Page 252, 11th line from the top, for "at"—read "to"; and in the following line, for "fixed"—read "fired."

INDEX TO VOLUME II.

Receipts during September.

W. H. Stoever, Philadelphia,	paid in full	
Chas. De Selding, Washington, D. C.	"	
Dr. Van Patten, "	"	1st & 2d Vol.
David Weartz, Waynesboro', Pa.	"	
Geo. W. Smith, Williamsburg,	"	
Rob. B. M'Kay, Northumberland,	"	1st & 2d Vol.
M. Miller, Winchester, Va.	"	
Rev. H. Ball, Baltimore, Md.	"	
Miss A. Sauerwein, "	"	
Rev. Geo. Parson, Muncy, Pa.	"	
J. P. Clarkson, St. James' Col.	"	1st, 2d & 3d Vol.
R. G. H. Clarkson, "	"	
"Female Lit. Society," Pinegrove, Pa.	"	
Guy Wheeler, "	"	
Wm. Bower, "	"	
V. L. Conrad, "	"	3d & 4th Vol
Jno. M'Farland, Harper's Ferry, Va.	"	
H. C. Greenewalt, Gettysburg, Pa.	"	
L. R. Long, "	"	
Chas. Hersh, "	"	
Chas. E. Weldy, "	"	
M. Garver, "	"	
B. M. Schmucker, "	"	
David Wills, "	"	
S. S. Forney, "	"	
A. C. Ehrenfeld, "	"	
Dr. Luther, Reading,	"	
Rev. Wm. Eyster, Germantown,	"	
Rev. W. S. Emery, Huntingdon,	"	
Dan. Kirkwood, Lancaster,	"	
Rev. C. Witmer, Abbottstown,	"	
Rev. S. W. Harkey, Frederick, Md.	"	
Henry Jacobs, Gettysburg,	"	
John B. Parker, Carlisle, Pa.	"	2d & 3d Vol.
Rev. A. Height, Bellville,	"	3d Vol.

TERMS OF THE RECORD AND JOURNAL. *One Dollar per annum in advance.*

Address—"*Editors of the Record and Journal, Gettysburg, Pa.*"