

THE AURORA.

IOWA STATE Agricultural College

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THE AURORA.

"SCIENCE WITH PRACTICE."

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LITERARY.

AMERICA, THE PRIDE OF MORE THAN ONE NATION.

Each circling year its darkness casts
Over the dim and shadowy past.
Those kings who ruled with iron
hand,
O'er many a broad and fertile land;
Those crested chiefs, whose dauntless
might,
Turned the fierce tide of many a
fight;
Those poets who, untaught by art,
Could rouse, or soothe or melt the
heart.
Sleep half remembered and alone,
Their deeds, their names are almost
gone;
And o'er their fame gray Time has
flung
His mantle, as he passed along;
Yet still some glorious deeds remain
Of Norman bold and fiery Dane,
Those wild, fierce rovers, proud and
free,
Those daring wanderers of the sea,
Well earned the name their Sages
gave
Of Vikings, monarchs of the wave.
Long ere Columbus dared to brave
The dangers of the western wave,
Their keels had grated on the strand,
That binds New England's rocky
land;

Red Erick's hardy sons had seen
Her broad blue streams and forests
green;
And where the Pilgrim city stands,
Bold Thorwald and his fearless bands,
Shook with their rugged oars the
brine,
Plucked the thick clusters of the vine,
And laid their huge strong limbs to
rest
Beneath the wild woods of the west.
No shore to which the Northmen
came
But keeps some token of his fame,
On the rough surface of a rock,
Unmoved by time or tempest's shock,
In Runic letters, Thorwald drew
A record of his gallant crew,
And those rude letters still are shown
Deep chiseled in the flinty stone.
So for his lady's lofty bower
Built he in part the well known
tower;
Then after years of bliss and joy,
She gave to him a lovely boy;
The first child of a Danish lord
Was born in that grand old fort.
Now under the tower, cold and deep,
Thorwald and his fair lady sleep;
And the young lord, the American
Dane,
Alas! he was by Indians slain.
His skeleton in armor was found by
the sea,
But his soul, like his country, for-
ever is free.

C. H. S.

INTER-DEPENDENCE OF MORAL AND INTELLECTUAL DEVELOPMENT.

[B. D. Smith, of Cornell College, Mt. Vernon, awarded first prize at the recent State contest.]

Isolation is death. Independence is but an idea, and not a fact. It has no existence in the world of matter or in the world of mind. The forces of the material world are inter-dependent. The powers of mind have a similar correlation. In the air we breathe, the life sustaining element, oxygen, taken alone, with its intense energy, would soon consume the spark of life. The nitrogen, untempered by oxygen, would smother vitality with its negative properties. All the vegetable world is subject to a pair of forces, heat and moisture. An excess of either is ruinous. Electricity resolves itself into a pair of factors, positive and negative; either of which alone has no power but to repel. In the realm of worlds there are two constant forces, centrifugal and centripetal. Should one for a moment lose his energy, the other would instantly hurl these worlds into universal chaos. In each of these departments of the world of matter the great powers operate in pairs, tempering each other's excesses, supplementing each other's efforts, imparting to each other power, each making it possible for the other to perform its functions; and in no case is one force perfectly independent of all other forces. The world of mind is subject to a similar law. In the development of human character, national or individual, there is a corresponding pair of forces, an inter-de-

pendence between moral and intellectual development.

The development of one faculty alone has within it the germs of its own debasement. To cultivate the moral to the exclusion of the intellectual is to produce a mind so destitute of intellectual power as to be incapable of distinguishing between the morally good and the morally bad. To develop the intellectual to the neglect of the moral is to produce a state of society so void of moral principle as to insure the destruction of that society by its own excesses. All history tells us that in the soil of pure morals, and nurtured by an atmosphere of intellectual activity, have the richest products of the human mind germinated, blossomed, and matured. To moral conscientiousness, guided by intellectual acumen, are we indebted for the true and the beautiful that have come to us across the waters of time from ages of the past. Would we of the present send these same treasures of truth and beauty, augmented, across the sea of an unknown future to generations yet unborn? Then let us profit by the experience of the past and the records of history.

The human intellect is well termed the sovereign of the nineteenth century, but the realm over which it sways the scepter acknowledges no human power as absolute. The mind's adherence to the moral conscientiousness of its realm is the key to its power. The champions of intellect, who try to ignore moral principle as a factor in mental development, point, as a verification to their claims, to the achievements of great minds that seemed utterly destitute of moral principle. Ah! but they forget, that greatness is never found in isolation, that it is a relative, and

not an absolute quality, and that there is no measure of intelligence save its power to cope with intelligence. They forget that in human society and in the workings of the human intellect, there is, and can be, no such thing as isolation; but that the superiority of any one mind is but the result of inherited qualities, sharpened and polished by attrition and conflict with other great minds. They forget that every one of these intellects that seem so powerful, and yet void of moral principle, has sprung up in an age of morals, in a society that held its moral standard high, from hearth-stones where the highest code of ethics, the Christian religion, was the standard of life. "The Cotter's Saturday Night," by Burns, is the fruit of lessons learned in a humble but pious home. By this it is not claimed that good morals depend wholly upon religious culture, for a high type of morality is often found where there are no pretensions to religious life. But it is claimed that the highest type of morals is invariably associated with the highest form of religion, for religion is spiritualized morality.

An individual may become mentally strong, and at the same time morally weak, as did the traitors, Arnold and Burr. But has that mental condition been reached independent of moral forces? Has that individual been free from the restraining, guiding, and moulding influence of moral society? Has he, coursing through his veins, none of the blood of moral ancestry? Perfect independence of the individual could result in nothing more nor less than complete destruction of the bonds that make human society a whole and human progress a reality. Absolute independence of the different powers and faculties of

the human mind could have no other end than the total wreck of those powers and faculties. Anyone acquainted with history recognizes the fact that the highest intellectual attainments of a people have been coincident with a high standard of ethics. The greatest intelligence and the highest type of morals may not have shown themselves in the same individuals, or even in the same classes. But what man, understanding the philosophy of history in general, and the results of the crusades in particular, will claim that the mental and moral conditions of any one class are ever free from influence by the rest of the world? European art in its grandeur, European morals in their preeminence, and European intelligence in its power, must acknowledge the healthful and accelerating influence of the Saracen Arab. Nor is this all. While absolutely independent intellectual progress is an impossibility; there is danger, terrible danger, in a high mental culture that is not supplemented by an equally high moral culture. The intense intellectual spirit of a recent English novelist created within her such a thirst for intellectual companionship as to overcome her wondrous self-control and cause her to violate woman's highest moral obligation. The mind that is heated in the forge of an intellectual forge must be tempered by a process of moral culture; else it will be brittle and snap in the fierce contests of life, or will be soft and yield under the pressure of duty. Let those who will, sing of the loneliness of genius; and chant their praises of Poe and Byron and Buddha, who isolated themselves from the world. But give us, as our heroes, Washington and Shakespeare and Paul of Tarsus, who drew the world about

them; and lived not only in its mind, but in its heart; who possessed, with the genius of intellect, the genius of ethics.

The champions of morality aver that moral growth is independent of intellectual progress; and, to sustain their statement, refer to the characters of little intelligence, yet leading, morally, blameless lives. They, too, fail to realize that there is no such thing as isolation of the human mind or character. If the moral element could isolate itself, it would soon, by lack of mental power be incompetent to judge the efficiency of even a moral code. Morality unguided by intelligence becomes superstitious. Idolatry found its origin in ignorant devotion.

Would you know the effect of a departure from moral conscientiousness? Then turn the pages of Median history, and note that as long as the Medes were true to the doctrine of Zoroaster they experienced an intellectual progress seldom equaled. Now turn but a few pages more and observe the corruption wrought by the Magi and a voluptuous court; and with it, mark the ebb of intellectual life that finally cast the bark of Median power into the hands of the Persians. This portion of history repeats itself in the chronicles of Greece. The decline of her power, both physical and mental, began with her departure from early habits of morality that left her temples desolate and her works of art a prey to wonder-seekers and decay.

Would you know the result of an attempt at independent moral culture? Then read the history of the Byzantine system; and mark the motto of its champion, Gregory the Great, "Ignorance is the mother of devotion." Now follow on but a few

pages and see its results; religious faith materialized, Southern Europe relapsed into semi-barbarism, intellectual spirit groveling in the dust, and morality itself ravished, murdered, and rotting in the cloisters of the church. Contrast with this Mohammedanism; and you find the almost magical power of its early priesthood to be in devotion to their religion, supplemented by a love of learning that bore such mottoes as "Eminence in science is the highest of honors," and "He dies not who gives his life to learning." And Luther's great reform, while it acted for the most part upon people of a low grade of intellect, went hand in hand with the grandest intellectual movement of the age, "The Revival of Learning."

Vain philosopher of the nineteenth century, can you look upon these facts in history and tell us that morality is divorced from intelligence? Can you say in the face of this evidence that there is such a thing as independent moral or intellectual development?

The air is rife with the clamor of false philosophers, who would call us from the quiet of earnest thought, and have us believe that they alone possess the key to a perfect life; the one is a study of the beautiful, the other in idle, ignorant faith. And we are prone to take a superficial survey of mental and moral conditions, and attribute results to sources whence they never could have arisen. The fruits of a sire's virtues are often mistaken for the product of a son's vices. The richest sheaf is often garnered by the hireling who never trod the field till the day of harvest. The beauties of the "New Renaissance" are but the gropings of sensuality, stumbling through life by the aid of an intellectual lantern. The gloom

of the "Dark Ages" is but the shadow of moral self-sufficiency. The key to a perfect national or individual life is obedience to the laws of inter-dependence between moral and intellectual development.

Trace these three principles from the ark on the top of Mount Ararat. Follow them down through the centuries. Ham is the incarnation of independent intellect, whose lack of moral principle brought upon him a father's curse, that found its realization in the gradual decline of cultured Egypt and the sudden fall of mighty Babylon, in the sting of the slave-driver's lash and the burden of unrequited toil. Shem is the personification of intense morality, that developed into the blind devotion of the Jews, a devotion so blind that they failed to recognize their Redeemer, that has made them outcasts in the world and their name a synonym for the root of all evil, selfishness. Between these two extremes stands Japheth, now with head bowed in devotion, and now struggling with in-born impulse for equality among men; now imparting to both Shem and Ham the principles of a nobler life, and now startling the world with the triumphs of his genius. By this pride of mind and humility of heart; by this activity of intellect and labor of love; by this *union of mental and moral*, Japheth wins, from Shem the crown of devotion, from Ham the sceptre of power, storms the strongholds of barbarity, and makes Aryan thought and Aryan principles masters of the world.

LABOR VS. INHERITANCE.

[Awarded first honor at home contest.]

A common mistake of the times is the great dependence people place

upon what they call genius or natural talents. We see a man who is eminently successful in life. He seems to tower above his fellow men in the profession he has chosen, and we call him a natural genius. The tendency seems to be to attribute too much to natural talents and to under-estimate the great importance of industry as an element of success. There are those who believe each man is designed for a special niche in life, that before he opens his eyes in this world his success or failure is already fixed and no effort of his own can alter his destiny. They believe that the great Judge, a just God, has the medals all engraved, the premiums all awarded before the great fair of life has commenced. It is not more reasonable to believe that each man is a free agent, given an equal chance in the world; that his success in life depends not upon special gifts of genius, but upon his own efforts, his energy and industry? True it is, our lives are modified by circumstances, but the lives of hundreds of great men of our country teach us that even circumstances, however unfavorable, are no obstacle in the way of a true man of purpose. Observation on every hand shows "that men are the architects of their own fortunes," and, though circumstances may slightly modify the plan or make less showy finish, yet if the architect but remains true to his work, he can build the grand edifice about as he designed it.

How often we hear such expressions as, natural poet, natural orator, natural artist; and in support of the theory that some men are born great, it is often reasoned that even children will show different degrees of intelligence. But even here the theory rests entirely upon appearances, for often we see the boy who was thought

a prodigy in his youth far outstripped in the race of life by the dullard of the family. The truth is, neither poets, orators, nor artists are "born," but made by their own efforts. Longfellow was called a natural poet, but his first effort was a laughable failure. Wendall Philips has been called a born orator, yet his first speech was a break-down, and he left the stage 'mid jeers and laughter. It was only after years of patient toil and study that he won the reputation of being America's greatest orator. I believe as a rule the men who have led the world have not been those who in early life were given credit for special gifts of genius. No one saw in the ungainly formed and awkward back-woodsman of Lawrence township, the great and beloved Lincoln, president of the United States. The people of Ohio, as they gazed upon the homely crafts of Pennsylvania Canal, saw in the boy Garfield only an earnest, industrious canal driver. But when by dint of his own energy he stood the honored head of the nation and at last lay in the glory of a martyr's grave, the world bared its head and called him a genius. Again, when he, whose sacred dust now rests on the banks of the Hudson, followed the lowly business of a tanner in Galena, the people saw in Grant only a tanner of leather. But when with an energy born only of a holy purpose he planted the flag of the union in the heart of rebellion, and dragged the rebel rag in the dust of treason, the trophies of the world attested the glory of his genius.

Yet, neither Grant, Lincoln nor Garfield ever believed himself the possessor of anything like special talents. Each believed he had earned his way in the world, and that he owed his success to the heart, brain,

and hand labor he had crowded into his life. That grand old philosopher, Benjamin Franklin, whose powerful mind could fathom even nature's laws, once said: "I know no road to success but the old highway of industry and well doing." That great thinker, Locke, whose mind has hardly a parallel in the civilized world, once declared that what is within the reach of one man is within the reach of all who, under like circumstances, apply themselves with equal diligence. Making exceptions for misfortunes and unnatural circumstances, it may be laid down as a rule that men are successful in life just in proportion to the amount of work they do. The great secret of success is labor; and though its reward is sometimes slow, yet it is seldom a man labors to obtain an honorable end without some degree of success. The country is full of men whom nature seems to have wonderfully blessed with strong bodies and brilliant intellects, who spend the summer of their lives in search of some other road to success and happiness than that of honest industry. The gray hair, haggard cheeks, and wrinkled brows of men who ought to be in the prime of life, show how few have found it. We can but pity the man who makes a failure of this life. He whose privilege it is to live in this grand age of the world, who slights his opportunity, squanders his time, betrays the great trust of God, and goes down to his grave with the dread thought of a wasted life, is a fit object for the world's pity. But in a country where it only wants a ready mind, a willing hand and an honest heart to insure success, there is little excuse for the man who fails. In a country where so many have raised themselves from the lowest condition

of poverty and ignorance to the highest pinnacle of greatness, surely success is within the reach of all who, with diligence and honesty of purpose, will strive by labor to attain it. It is a long road from poverty and ignorance to honor and eminence, and they who have traveled that road declare that it is lined with thorns and dangerous pit-falls, that along its rugged borders are strewn the ghastly wrecks of human hopes; but he who loves labor, who scorns idleness, who is true to his God and himself, can endure the thorns, can escape the pits, and though he may never mount to the highest round of fame's gilded ladder, he can at least achieve a deserved success and the glory of an honored name. J. E. DURKEE.

SCIENTIFIC.

CORRECTION LINES.

The law, which established our system of government surveys, requires that these two conditions be fulfilled, viz: first, that the north and south lines shall be true meridians; second, that each township shall be six miles square.

It is physically impossible to fulfill both these conditions at once, because the shape of the earth causes the meridians to converge towards the poles, thus making the north line of each township shorter than its south line. This difference of width becomes more and more marked as the latitude of the surveys increases, and some provision must be made to correct for the errors thus occasioned. This is attempted by locating what are known as correction lines. These are parallels bounding a line of townships on the north when north of the base line, and on the south when south of the principal base. The

surveys, as they are continued, are laid out anew, the range lines again starting at the correct distances from the principal meridian. These correction lines are placed at different intervals in different states, sometimes at every ten townships, again at every fifteen, or at some other distance.

In Iowa, there are two principal correction lines, the southern one being a little north of Des Moines, and the other being ten townships north of the former. Each range should be as much over six miles in width on each base or correction line, as it will fall short of the same width where it closes on to the next correction line north of it. The excess or deficiency must be added to or taken from the western or north-western sections or half-sections in such townships whenever the exterior line shall exceed or shall not extend over six miles.

So that the excess or deficiency may be thrown onto the north and west side of the township, it is necessary to survey the section lines from south to north on the true meridian. This always leaves the results of the north line of the township to be governed by the converging of the meridian and by the convexity of the earth. EDITOR.

NATURE'S SILENT WORKSHOP.

BYRON D. HALSTED.

There are many workshops in which various workmen labor. Some are human factories where men and boys, women and girls toil for the production of articles that are either necessary or desirable. We would not for an instant belittle the importance of human workshops or reflect in any way upon the

methods that there obtain. There are, however, laboratories and factories upon which all human manufacturing establishments must depend for very much that the laborers work upon and with which they labor.

A worker in wood needs to have his lumber furnished him; he cannot produce it himself. Our cotton factories would shut down forever if the earth failed to yield the long fine seed-hairs that constitute the raw cotton. Looking at the question in another direction we will see that the factories of our busy thriving towns would be as silent as the tomb, if the food plants of our globe should fail to provide the required nourishment for man and beast. If the grass in the pasture is dead the sheep and the cattle perish also. "All flesh is grass," the ancient prophet tells us, and reason and experience bear full testimony to the truth of the words of the seer. In brief, we are wonderfully dependent creatures, at the best, and our dependence is often in directions of which we least think.

Thoreau reduced the necessities of life to food, shelter, clothing, and fuel. In a climate more favorable than our own, it is possible that the number may be reduced to the first entry in the list. If we look squarely at these indispensables, it will be found that all are products of life and primarily of plant life.

The forests shelter us more than the hills, although we must grant that stone and brick are no small part or the building material of the civilized world. But even here it would be difficult to prove that without the use of some product of vegetation first-class brick could be furnished sufficiently cheap to be within the reach of the average builder. It would be a sorry type of a stone house that is constructed with forces not derived from or made available by the vegetable world. It might be a heap of stones on the hillside left there by the retreating ice river under

the melting heat of a post-tertiary sun. But why need we dwell further upon this point. We cannot retain our normal heat of the body or lift our smallest finger through a single inch of space without using up force derived directly or indirectly from some plant. The person who passes his eye over these lines and carries away whatever ideas may be herein expressed, must make good at the dinner table the loss sustained by the effort.

This is not a low measure of literary labor, but simply the two end links of a chain of dependencies that bind us until the day when our bodies of flesh are no longer for us to dwell in.

The reader is not to understand that the amount of mental labor is to be carefully estimated by the number of pounds of bread and meat eaten daily. It is possible that the student who eats the most may be familiar and even quite at home at the foot of his class. A hundred gateways may be open for the escape of energy or force. Poor digestion may lag behind an unnatural appetite.

If vegetation does so much of the world's work, it is only natural to ask when this labor is performed in the structure of the plant. Is there one part more active than another in the production of those substances that furnish the food for animals, clothing for man and fuel for warming our homes and driving the machinery of the mills? Does the plant do all this work without outward help, or is it the laboratory of activities for a higher force than resides within itself? On the desk is a grain of corn, dry and hard, and apparently as lifeless as the pebble the child has placed beside it. In an unguarded moment the child's fingers might have grasped the kernel and placed it quickly between two rows of sharp white teeth. The grain husk would have been broken and the interior ground to a meal by the human mill. We might say with a fair degree of accuracy that we have seen the last of the grain of

corn. Otherwise, the kernel might have been placed in a bottle with its associates and arranged on a museum shelf for many years. It is still apparently inert, having no more manifest vital activity than the bottle containing it. Again, we place our original grain in a saucer of water and it swells, possibly bursts its covering, but soon decays. We again assume our grain is whole and as first natured. It is placed on damp cotton in a saucer and set in the ice house close upon the ice. To the swelling we may have a feeble sort of initial growth or germination. Until now no minute plant has manifested itself and now this remains small and soon perishes. Let us suppose the original grain in the damp cotton, but instead of the ice house, it has a warm dark room, in short, the saucer is placed in a dark drawer of our table. The germination goes farther, but stops short when the bulk of the food stored up in the grain for the early growth of the young plantlet has been exhausted. In place of the dry hard grain that the child crushes between its teeth, there is a cluster of roots covered with fine hairs within the cotton, and above rises a short pale stem with a few sickly leaves. A few days later the plant has become lifeless, and blackened by decay. We have supplied just sufficient conditions for the seed to commit suicide.

We will try again—supposing our abused grain has as many lives as the proverbial cat. On a bright May morning the kernel is dropped in the warm soil. A passing cloud waters the earth and the birds sing as they should not at any ordinary burial. A week passes quickly and from the soil springs a coil of greenish layers that soon expand into the stem and rich green foliage. The grain is reduced to its thin covering and in its place we have the refreshing promise of better things—the growing corn plant with its several hundred folds of increase fairly insured if conditions con-

tinue favorable.

We have not given all the steps of proof for the proper conditions for the germination and growth of the corn plant, but it is clear that moisture, free access of air, warmth, and sunlight must be secured before the plant will pass beyond the stage of germination and become an independent, self-supporting plant. Germination will take place without sun-light, but the leaves take on a rich green only when in the light. We see, therefore, a close relation existing between green leaves, sunshine, and plant growth. The light turns the leaves green and green-leaved plants grow when supplied with sunlight.

Look at our corn plant in August with its long, broad, and thin, green leaves waving in the light and air. If we had arranged a structure for the exposure of a large amount of surface at the least expense of material, the work could not have been more economically done. If the leaves are removed the plant is seriously injured, if not destroyed. When a plant is excluded from the light its growth ceases. The sun is therefore the great but distant source of energy to the plant. It is not for us to go behind or beyond the sun and seek out its source of power. We need to trust where we cannot trace. There is to most, perhaps to all normal, minds an Omnipotent; and in referring the source of energy of the plants to the sun, we only take one step nearer to the Universal Father.

The leaves of our corn plant, and those of all independent, self-supporting plants, are made up of a vast number of small sacs or cells packed together and making up the soft substance of the leaf. The green color is due to a substance present in minute particles within the sacs or cells. In these green granules the sunlight is potent, effecting many wonderful chemical and vital changes. It is here that the crude elements that come in the sap from the soil and the gasses from the air outside

the leaf are transmuted into substances that are able to nourish the plant. We have found the laboratories in which these exceedingly important changes take place by which organic matter is elevated to the dignity of organic substances. These workshops are very minute; being only a small fraction of an inch in diameter. They, however, make up in number what may be lacking in size—a simple leaf contains many thousand cells. The waves of light coming more than ninety millions of miles strike upon these green granules, and without a sound to our dull ears, the work of vitalizing the whole range of organized beings is silently carried on.

Throw over the growing plant a covering of black cloth so that the sun's rays are intercepted, and the darkened leaves soon lose the green color. The laboratories are closed, the workmen are gone, and decay quickly attacks the structure. Unless sunlight is restored before the disorganization is fairly begun the plant is past recovery.

It is no wonder that the sun has been an object of worship by so many nations and in so many ages of the world. They realized that much of good and perhaps more that could be evil resided in the sun. They did not know as we do that the rays of the sun carry with them a manifold combination of heat, light, and chemical influences that only the physicist can measure and compute. Taken as a whole, we know that they make life possible on this globe. They provide the proper conditions for assimilation in the plant; they erect the laboratories for their fellow vibrations, and do the work of starch making and the elaboration of those other compounds so essential to the well being of man.

Instead of a single plant being excluded from the light, imagine the whole vegetation of the planet thus shut away from the sun. In other words, let the sun cease to shine for the earth—a total and eternal eclipse—and the

blackness of darkness would be synonymous. Rivers and oceans would become rivers and oceans of ice, and all life would be extinct. Think of the coldness and darkness of that intensely silent, endless night. Contrast it with the brightness and beauty of a day in June, when the meadows and forests are dressed in living green and the birds and flowers fill the air with perfume and song until we think that the earth has been raised almost to heaven. The earth is bathed with life giving rays and every laboratory is active, raising the dead into vitality, for another resurrection day in nature has come. There is a cry, come up higher, and the inorganic takes on the organic and the dead material clothes itself with life.

We stand uncovered in the vivifying sunshine and contemplate the green woods and meadows before us, conscious that the most wonderful changes are being wrought but not within the grasp of our finite senses. The eye cannot see or the ear hear, but the thoughtful mind knows of the subtle mysteries of life around him. The toiling of the lily is so harmonious and its spinning wheels run so silently that before we realize the inimitable process the product of delicate floral tissue exceeds in richness and beauty the robes of the wisest king.

THE HISTORY OF RAILS.

The first rails used were wooden beams or trams, fixed to the ground and furnished with flanges to prevent the wheels of the vehicle from slipping off the track. These were in common use in the early part of the seventeenth century in the mining districts of England. This period was not favorable to mechanical improvements, and it was not until 1700 that any marked change took place in the original tramway.

About this time the double rail came into use. This consisted of a support-

ing rail below, and a wearing rail above, to be taken up and replaced when very much worn.

Next, the wooden rail above was covered with strips of iron, to prevent the excessive wear and tear to which they were subjected.

This was a great improvement, but they were defective, and for them were substituted, in 1740, the cast-iron rail, with a continuous flange or ledge on the inner edge, to keep the wheels on the track. These rails were placed on cross wooden sleepers or ties.

A few years after this (1789), the rails were made without the flanges. The upper surface of the rails was smooth, and the flanges were placed upon the inner edge of the wheels. The rails were 5 feet long and 4 inches by $1\frac{3}{4}$. They were pinned or bolted into cast iron chairs, and these rested upon the ties.

This was commonly known as the Edge rail.

The cast iron rails could not be made longer than four or five feet, and soon after the introduction of wrought iron, it was substituted for cast iron in their manufacture.

This permitted an increase in the length of the rail.

About this time the flat rail was used to some extent.

Roads with these rails were constructed by using cross wooden ties, to which were fastened longitudinal wooden rails. And upon these rails were flat bars of iron, $\frac{1}{2}$ or $\frac{3}{4}$ of an inch in thickness, and from $2\frac{1}{2}$ to $4\frac{1}{2}$ inches in width. These were fastened by means of spikes, whose heads were counter-sunk in the iron. This method proved dangerous, because the ends of the rails were liable to become unfastened, and turn up and pierce the bottom of the cars.

The wrought iron rail, commonly known as the fish-bellied rail of 1820, weighing 33 pounds per yard and placed in cast iron chairs, was then

used. At first these rails were made of bars of iron heated and passed through a series of rolls, until the final rail section was obtained.

But a serious objection to this method was that the rails were composed of many welded parts, and these were often defective in their union.

Wrought iron rails thus made gave trouble by splitting, as the traffic and weight of the rolling stock increased. This serious defect was remedied in 1857, when the steel rail was first introduced into England, and so greatly did they surpass the iron rails that, notwithstanding their increased cost, the demand for them was greater than the supply. At first they were used only at places which were subjected to heavy wear, such as switches, frogs, crossings, etc.

Then they were gradually introduced by roads having heavy traffic, and finally they have come into use in first construction of important roads, and as the iron rails wear out they are replaced by steel.

The manufacture of them has rapidly increased, and the cost of production has been reduced, especially since the introduction of the Bessemer steel process in 1862.

Steel rails are high grade, homogeneous iron, rolled from solid ingots, and they are perfectly free from the objectionable weld of the wrought iron rails. Previous to the adoption of the Bessemer process, there was in the market an iron rail with a steel cap. This was expected to meet all requirements, but actual use proved that it was impossible to obtain a perfect union between steel and iron.

It may not be out of place to give a brief description of a few of the different kinds of rails which have been in use at various times. The iron rails, which are generally straight bars of wrought iron, differ greatly in shape of cross section, weight, quality, and manner in which they are secured to the

road-bed.

The fish-bellied rail soon gave place to others of more economical shapes, such as the inverted T, the I, and the bridge or hollow rail.

These have been variously modified, both in form and proportions.

Other forms, not mentioned, have been used at different times.

The double-headed rail should receive special attention, as it is the rail in common use in England. This is the first one which had sufficient vertical strength to permit of its use as a girder or beam between supports.

It can be turned when one head is worn out, and thus two rails are obtained for the price of one. It weighs 62 pounds per yard, and is easily rolled. It is supported on each tie by a heavy cast iron chair. A key, driven between the chair and the rail, keeps the rail in its proper place; and as long as this is kept tightened up, the rails and the chair will be as one piece.

The cost of fastening is increased and the bottom of the rail is liable to become more or less indented, and oftentimes it is made wholly unfit for reversing.

The flat-bottomed rail, found mostly in the United States, is much superior to the double-headed rail, as it is more economical, as the fastenings of the joints are more simple, and besides it does not need the cast iron support on each tie.

The pear pattern was supported at the joints by wrought iron chairs. But because of the difficulty of fastening the joints, it was not well fitted for heavy service.

Various trials were made with different sections, and the rate of wear on both rail and wheel were noticed, and a rail, of a similar shape to the one now in use, was decided upon.

This is the inverted T, more commonly known as the American rail, and it is in general use in the United States.

It has a broad-bearing base and is

easily secured to the ties by hook-headed spikes driven into slots in the edges of the flanges or over the edge of the rail. This allows for the expansion and contraction of the rail with changing temperatures, without destroying the fastenings.

The cast iron chairs, used to seat and hold other rails, were at first used to strengthen joints, but now the most common way is to fish the joints by plates.

In joining rails end to end, it is desired to obtain a smooth surface, and so great care must be taken to attain perfect steadiness in the required line of direction. The ends of the rails are now generally joined together by a plate of malleable iron placed on either side. These are called fish plates. Two of them are used at each joint, and they are bolted together by four strong bolts passing through the rails.

A rail is divided into three parts, the head, the web, and the base, but trackmen are not satisfied with these names, and so they call them the ball, the neck, and the foot. The best rail will have these three parts in their due proportions. There must be enough material in the head to withstand the wear. The thickness of the web should be a minimum, and the depth a maximum, and the base should be wide enough to secure a good, firm, and sufficient bearing. Then it would have the greatest resistance against deflection in a lateral direction.

It will now be well to consider the weight and size of the rail. With a base of four inches, 60 pounds per yard is about the minimum in practice. Many roads use lighter rails, but the extra wear on the ties and the increased cost of keeping up repairs, are greater than the difference in cost of the two rails. Since 1854 the weight of the rail has been steadily increasing, from 35 pounds to 85 pounds, and sometimes even higher. The tendency is to return to the lighter rail, and also to re-

quire it to be made out of iron originally good. The iron is much better when worked into a light rail than a heavy one. The extra working of a light rail increases its durability more than the extra cost per ton. The miserable quality of much of the iron on our roads is due to deficient working. Rails of 45 pounds have worn for 20 years under the heaviest traffic, while others of double the weight have given out in a few years. About a 64 pound rail will suffice for a heavy freight or passenger traffic, and 70 pounds for very heavy service, or for fast passenger trains. The heavy rails do not bend so easily, nor the joints do not sag so quickly, and for these reasons they keep the track in a much better line. While heavy rails require more men to handle them, still, when once in place, they are more permanent. Their bases are broader, and thus allows more bearing upon the ties. The base should have its sides rounded off, and not have them brought to a sharp edge, as is often done, because this wears away the ties too rapidly.

Rails have gradually increased in length from 15, 16, 18, 20 to 30 feet. The latter is the common length now made by the American rolling mills, and used upon American roads.

The height or depth of a rail is an important feature, for, if other things remain the same, the stiffness increases as the square of the depth. Thus doubling the height, the weight remaining the same, gives four times the amount of stiffness. If you double both height and weight, then the stiffness is eight times as great. The lack of stiffness is apparent in the deflections between the supports under the weight required to be sustained, and the mashing of the iron into the wood of the ties. If a rail deflects it produces the same result as if the wheels were ascending a hill. Barlow found the deflection of a 50 pound rail, $3\frac{1}{8}$ inches deep, under a load of five tons

at rest, was equal to a grade of 25 feet per mile. If the track has settled, and any one tie does not rest upon the ground, this deflection will be greater, thus corresponding to a steeper grade. High speeds will also affect this in a similar manner. The importance of the depth of a rail has been shown, and the depth has gradually increased from 3, $3\frac{1}{4}$ and 4 inches, to 4, $4\frac{1}{2}$ and 5 inches.

The usual size of a 65 pound American rail is $4\frac{1}{2}$ inches high and 4 inches wide at the base, the thickness of the web from $\frac{1}{2}$ to $\frac{3}{4}$ inch, and the width of the head from $2\frac{1}{4}$ to $2\frac{1}{2}$ inches. The quality of the iron from which they are manufactured, the amount of traffic passing over them, and the speed of trains, are essential features in the life of rails. The first rails made in England were of the best iron, and great care was used in the making. The result was that those rails sustained an enormous traffic for many years; in many cases from fifteen to twenty years.

One author states that good iron rails will, under favorable conditions, last eight years under an average traffic. But from three to six years is all the wear that can be expected of ordinary rails doing a fair amount of work.

With the steel rail, as with the iron rail, much, if not everything, depends upon the quality of the metal used. Experiments have shown that a good steel rail will last as long as sixteen iron rails, the use of both being the same.

EDITOR.

The President of the Science Club showed us the quickest if not the most scientific way to descend from a platform.

The list of rules at the Kansas Agricultural College is quite short, simply, "Behave as ladies and gentlemen."

THE AURORA.

PUBLISHED MONTHLY BY THE

Literary Societies

OF THE

Iowa State Agricultural College.

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"THE AURORA,"

Ames, Iowa.

The late date at which the March number of the AURORA came out was largely due to delay on the part of the printers.

The resignation of President Hunt, was a surprise to many of his friends; yet he had contemplated the action last fall. He determined to attempt the present school year's work, hoping that he might recuperate his failing strength.

His hopes have not been realized, hence his connection with the college will cease the 1st of May. President Hunt gave to the college his best efforts; had he been more conservative of his energies, no doubt his resignation would have at least been postponed. In the resignation of Prof. Hunt the college has lost an efficient executive. His firm hand has held the reins of government in complete control. His administration has been short, yet fraught with much that will be of permanent value to the institution. Among the many efforts for the good of the institution that he has put forth, none will probably be more productive than the "Ladies Course." This has satisfied a want long felt by the young women of Iowa. We might point out much else of good that has come to the institution during President Hunt's administration, but suffice it to say that his friends deeply regret his resignation, and none the less do they regret the loss of Mrs. Hunt from their midst. Long in memory will be held the pleasant associations that cluster around her name.

It is with great regret we learn of the resignation of Prof. Wynn. We had intuitively felt that the professor had made his home within our walls. He became connected with the college in its infancy, and has given the best part of his life to the building up of the institution. We feel the loss. Prof. Wynn has won a place in the hearts of the Alumni and students, that is the pleasure of but few teachers to enjoy. Each year, as Alumni revisit the college, we hear expressions from them of the tenderest regard for Prof. Wynn. The professor, as a teacher in his department, is not excelled by anyone in the west, his skill in elucidating the text is but a fraction of his teaching. In the class room, from the pulpit, in social intercourse Prof. Wynn's model Christian life is felt

by all with whom he comes in contract. The influence of Alumni and students should be brought to bear upon the Trustees to secure, if possible, the recalling of the Professor's resignation.

Various presses of the state are doing advertising, for the college, in their discussions of the kind of man needed at the head of this institution. The Register defines the kind of man that will be secured: "A broad strong man, one who will have the requirements to fill up the position as it should be in every respect, and give repose and strength to the college." All that are acquainted with the strifes that have existed in this institution during the last few years realized that in order that the college may have "repose and strength," an executive must be chosen, whose ripe experience in educational work; whose scholarly attainments and force of character will be recognized by faculty and students. But few men make good college presidents. It is something more to preside over the destinies of students than to superintend a cotton mill. He should be a man who would impart an individuality characterized by the highest virtues, to those with whom he comes in contract. It is needless to attempt to enumerate the manifold qualifications that the president of a college should possess. Where is the man we need is the vital question. Public opinion throughout the state replies, "not in politics." This is the sentiment of those most acquainted with the management of state institutions. Politics is the greatest enemy this institution has ever had. It bespeaks much good for the institution that the public are apprised of the fact. It is not probable the man that we need here, can be easily secured; he must be "worked." It is unfortunate for all concerned, that our board have so limited time in which to secure a president. It is highly im-

probable that the man we want can be secured in a month. Iowa College has been looking for a president for over a year, but have not yet secured the man it wants. The Trustees of Wisconsin University of Agriculture, will have had more than two years during which to select a new executive. The fact that great care and wisdom should be used in the selection of a president, can not be put too strongly. The University of Michigan eked out a miserable existence until the valuable services of President J. R. Angell were secured. Cornell's unprecedented growth and position in the educational world is largely due to the happy selection of President White. The AURORA has not the least doubt that the Board has the welfare of the institution sufficiently "at heart" to allow some one of their choosing to assume the management of the institution until the right man is found. The names that are now being discussed are Mr. Chamberlain, of Ohio, now secretary of State Board of Agriculture; Gen. John Eaton, late commissioner of education of the United States; Prof. Henry, of Wisconsin University; Prof. Roberts, of Cornell, N. Y.; J. W. Akers, Supt. of Public Instruction; Ex-Senator James Harlan, of Mt. Pleasant; Bishop Kephart, of Western college; Ex-Gov. C. C. Carpenter and Prof. Macy, of Iowa College.

EXCHANGE NOTES.

John Morrison, of Sigourney, one of the trustees of the Iowa Ag'l College, informs us that Prof. Wynn has sent in his resignation to the board. We would respectfully submit to the board that they return the resignation to the Professor with an entreaty to withhold it. We believe that ninety-nine out of every hundred students who have ever attended the Agricultural college will sec-

ond us in this suggestion. Professor Wynn is the model man of the faculty. His loss to the institution would be an irreparable one.—*What Cheer Reporter*. Mr. Burke, '78, voices the sentiments of students and Alumni.

The *Delaware Review* came in good this month. It is below par in material.

The *News Letter* has an interesting article on "The Fauna and Flora of Iowa."

"The Typical School Girl," as portrayed in the *Lasell Leaves* is in demand the "world over." "Womanliness of character not inconsistent with learning and a degree of housewifeliness which enables her to make home all that is meant by that sweet word. Flowers blossom at her touch; cares disappear beneath her fond caress; the hungry are fed by her; and earth approximates as nearly as possible to the paradise of Eve." The AURORA is inclined to think(?) this an advertising scheme to get inducements for emigration offered to the thousands of the "fair sex" who realize that as long as they live in Massachusetts they "leave all hope behind." Or possibly they hope to secure an immigration of the "sterner sex" from the west. The AURORA thinks the "advertisement" is a lucky hit if the "Typical School Girl" is a species common to Massachusetts. The solution of the problem of the inequality of the sexes in that unfortunate state soon will be solved.

The *Wooster Collegian* for March, is a memorial number, in honor of the memory of Miss Annie B. Irish. Fitting tributes are offered from students professors and friends.

The *Fayette Collegian* savors much of politics. I think the college paper no place for such topics.

The *College Chips*, in the last number, reviews an article in the *Nation* in which a comparison is drawn between Harvard and Yale. The *College Chips* reviews the article very conservatively. It is painful to exchange an old idea for a new one, even though the new one promises more than can ever be hoped of the old.

In order to succeed in the world the student must make of himself a specialist. The extent to which division of labor has been carried in all branches of industry has made it impossible for any man who has not a special training in a particular direction, to succeed. Here at college we can develop our intellects in such a way as will aid us most in after life. We ought not to be satisfied with simply a diploma. A diploma represents a certain amount of general training; but in securing that general training we can just as well develop ourselves in a special direction by a little more application and a little ingenuity in the choice of electives,—*Universal Press and Badger*.

The *Chartes College Gazette* of March contains a practical article on "The Value of Education," by the president of the college. This article gives considerable dignity to the issue.

The *Delphic* gives four columns to society news.

The *College Index* is one of our best exchanges. The last copy was poorly bound.

The Lecture Association secured Dr. Welch to deliver his lecture entitled, "Higher Education for the West." It was very instructive and entertaining as are in fact all the Doctor's addresses. The Lecture Association will do exceedingly well if the remainder of the course of lectures is as profitable to the students as the first has been.

LOCAL.

Salt.

In coffee.

And sugar.

In salt-cellars.

All Fools' Day isn't it?

"April showers bring May flowers."

The Chem. Lab. is as neat as a new pin. It wears quite a different aspect since each desk is supplied with an entire "side shelf."

At twelve every horn in the building begins to groan and every violin to wheeze.

The Proctor.—Quiet reigns where ever it (Everett) goes.

The new command in military tactics is: 1. Left. 2. *Face*. 3. MARCH. The captains will please take notice and govern themselves accordingly.

Lilley & Co.'s tailor has taken the cadets measure. Soon the boys will be clothed in "patriotic blue."

The Bachelors recently decided that attendance at chapel should not be compulsory.

We notice several students who wear S. V. badges, one the three links, two the square and compasses, and still another the keystone.

Running up and down stairs should not be aloud. So say the occupants of No. 77.

The Juniors in Zoology are doing some splendid drawing.

Prof. to student in Syke—"What do you remember of chapel exercises?"

Student—"The closing hymn."

The bell taps on time to the tick of Geo. W. Greene's watch.

Our literary societies are all doing nicely. How can they do otherwise than succeed. No one cares to "pass it up," but all seem anxious to do as much work as possible.

The Juniors have agreed to disagree. If we are to be favored with the customary Junior X the faculty will evidently have to appoint the orators.

The Hornaday collection has been forfeited. Had the college secured this its museum would have been the best in the west. The state is too poor to pay for the mounting, which would have secured it.

The once beautiful drive is now not in the best condition. Why loaded wagons are allowed to pass over and cut it up is a mystery.

The picture and name of the new tribe who entered the I. A. C. this spring, that decorated the wall recently, was pronounced by the Sophs to be a forgery. If the Sophs don't do their duty soon, the Freshies will be known as Shangadahnees.

The Philo's have at last secured a neat bulletin board. Send your congratulations to the corresponding secretary.

Every first class college has a gymnasium. Physical culture is nearly neglected here—one hour per week. The gymnasium the students erected was sold last winter to satisfy an unpaid bill. What we will do without "Gym" the future must answer.

The Clio's lately received a very pretty hand sketched vase from Lydia Schreckenghast.

Six or eight of the Flatheads seem to undergoing a retrograde development, i. e. becoming Owl Eyed.

Will a nickel be no good?

Will wonders never cease! Has this sleepy old place awoke! We now have a solid, six feet wide walk to the Chem. Lab. The old walk was dangerous when the Flatheads entered, and has been badly out of repair even since the early days of Josephus Lypes. Why can't it be continued to North Hall?

The Philo's concluded after a great deal of warm discussion that the state should furnish text books to the common schools.

Did any one ever before see such an assortment of bangs as those that adorn (?) the heads of the gentler portion of the students of the I. A. C.?

All the captains of the battalion drilled as privates in Co. B, and all but one as officers in the same.

A broom brigade has been organized with about thirty members. The uniform will be of blue flannel trimmed with gold braid. All their movements will be fancy, such as hollow square, triangles, St. Andrews Cross, etc.

"Open up your room, or I'll have you fired from the institution," it properly accompanied by two kicks and a bang will gain admission into any room in "Senior Section."

The staff officers were accidentally omitted in the last issue of the AURORA. They are given below:

Major, W. B. Hunter.

Quartermaster, Capt. G. W. Sturtz.

Adjutant, Lieut. F. W. Boyd.

Sergeant-Major, F. Durham.

The Y. P. C. A. and the Sabbath school are both largely attended. The latter has nearly a hundred scholars enrolled.

The same text was selected as the subject of remarks three Sabbaths in succession this spring.

Pres. Hunt has resigned his position here as chief executive. He expects to spend some time in Europe that he may regain his former health.

The first matched game of football this year was between the building and cottage—eleven to fourteen. Of course it resulted in favor of the building.

Embarrassed new arrival to dignified senior: "Does this stairway lead up stairs?"

The class in anatomy recently had the pleasure of witnessing the post mortem examination—of a canine.

South tower on the third floor is as bad a cen as it was last year.

Quite a number of the students attended the play, Union Scout. All speak highly of the tableaux.

The vets' mustaches are like faith—the substance of things hoped for, the evidence of things unseen.

The Science Club starts out this spring with a great deal of enthusiasm.

The Science Club held its first regular monthly meeting in the Crescent Hall, last Friday evening, April 9. There were four interesting papers presented on the following subjects: Mr. A. S. Hitchcock on "Ultimate Analysis," Mr. James W. Bradford on "The History of Rails," Miss Cora D. Wagner on "The Order Composita," and Mr. W. M. Hays on "Different Grasses Withstanding the Frost." Each of the papers was well discussed, and the evening was profitably spent by all. The membership now numbers ten active members.

The next meeting will be held Friday evening, May 7.

The present officers are:

W. M. Hays, President.

Vene C. Gambell, Secretary.

John James, Treasurer.

"They say" the tableaux in senior section rivaled those at the Union Scout.

We understand the tailor from Boone was quite well patronized.

The I. A. C. is well represented at the I. O. G. T. lodge in Ames.

PERSONAL.

'87. Will Porter, once of class '87, spent a short time with old friends here while on his way home. Will has been attending Drake the past winter and intends to return in the fall.

'85. Wilber Rice is a practical farmer in Nebraska.

Mr. Davidson, who entered with class '86, is back with the "Owl Eyes."

Senior Chatterton has been confined to the Sanitary Building with measles. He has also been suffering with a severe attack of dyspepsia.

Jno. James spent a short time here. He will not be with us this spring, but will return in the fall to graduate with his class.

J. B. Allen, who entered with class '87, stopped to visit old friends here. He has been teaching in Marshall Co. and was on his way home, in the Bluffs.

'86. The Misses Poyneer made the college a hasty visit recently.

'88. Nat Spencer is down with the measles, as are also four Freshmen. There have been more cases of measles this spring than usual, but in a very mild form.

'88. Mabel Lucas is a student at Calanan College, Des Moines. Nellie Barrett is also at the same college. Nellie has our thanks for items so kindly sent us.

'87. V. L. Culver who spent '84 at the I. A. C., stopped over night here on his way to Chicago, where he has accepted the position of book-keeper in one of the departments of the C. & N. W.

Dr. Holliday, of Burlington, stopped here to visit his son, who is a member of class '89.

'88. Effie Thomas spent Sabbath with her old I. A. C. friends.

'87. A recent letter from T. J. Wormley tells us he is enjoying the good things of life. Tom's clear lead is sadly missed by the band.

Dud Graves and ye Local spent a couple of days in a sugar camp on the Des Moines river not long ago.

Dr. Halstead spent the winter in Cambridge, Mass. He devoted three days in the week to physiological, and the remaining three to cryptogamic botany.

The Misses Wynn spent a few days visiting their many friends here.

Geo. K. Cherrie is in the employ of Ward & Co., of Rochester, N. Y. Cherrie is an enthusiastic student of natural history.

Miss May Bowles, a student at Cornell, visited her friend, Miss Grace Frater, here recently.

F. H. Ripley, who spent '84 here, writes his friends here that he is a "jolly farmer boy" at Franklin Mills.

Mr. Hasbrook, of Humston, spent Saturday and Sunday with his son here.

'88 John Abraham, unaided and alone, convinced two of the judges in the Philo Society that President Cleveland was justifiable in vetoing the Des Moines river land bill. He thanked them and coolly said he thought Cleveland did a mean act when he vetoed it.

Sam Hedges has taken the place occupied by Mr. Meek, the president's private secretary.

Sam now attends to all business except conducting Chapel exercises.

'88. John Clarkson is taking private lessons under Dr. Welch.

'86. W. B. Hunter drills Company I, Third Reg. I. N. G., at Nevada. We predict Co. I will not be excelled this summer in the encampment.

'87. Charlie Curtiss spends Sabbath regularly in Nevada. Why is this thusly, Charlie? You might as well 'fess up.

'88. Jessie Gaston and Clara West favored their friends here with a short visit.

'88. Wilber Moore is the efficient salesman at Baker & Baket's book-store. When you go to Des Moines be sure and call on him.

'88. W. S. Godfrey spent a short time at home on account of ill health.

Freshman Sterrett has been called away by a telegram from home.

'86. Rumor says that Fannie Carson is married.

Later—Fannie and also her sister Aertie, who graduated here in '83, were both married Christmas Eve.

ALUMNI.

'79. W. M. Scott is sole proprietor and publisher of the Larimore, Dak., Pioneer.

'81. The law firm of McGavern & Dewel, of Missouri Valley, is reported to be doing a thriving business.

'85. Frank Leverett is instructor in geology and natural sciences at the Denmark Academy.

'84. Geo. Wormley is President and Faculty of the Hazel Dell Academy, situated in the thriving little city of Newton, Iowa.

'85. W. A. Grow is editor of *West-side Dispatch*.

'74. "Archie" Clark is training the young idea at Deer Trail, Col.

'86. L. D. Jackson paid his *alma mater* a flying visit.

'84. Bert Hitchcock is pursuing a course in the natural sciences and languages here.

'86. John Pope is in Chicago. So writes "Capt. Dennis."

'85. W. E. D. Morrison has a booming practice in Sioux City. He has lately taken in a partner from Edinboro', Scotland. They are the only practicing Vets there, and are soon to erect a \$10,000 barn.

'84. Joe Porter is in the employ of the Western Light Co., of Chicago.

'84. E. J. Nichols orders the AURORA sent to the Duncombe House, Fort Dodge, Iowa. Nick is employed as a civil engineer by the Mason City & Ft. Dodge R'y Co.

'85. Oak G. Norton graduates from "single blessedness" almost as soon as from the I. A. C. The AURORA wishes them unbounded success and happiness.

'84. F. L. Pitman is assisting in the high school of Clyde, Kansas.

'88. M. J. Riggs is now with S. M. Hewett, a bridge builder of Minneapolis, Minn., and reports himself well pleased with his situation. He is spending his spare time in taking a post-graduate course at the University. The AURORA wishes him success in his new work.

'83. Geo. Glover is located at Longmont, Col., and is quite successful as a D. V. M.

'78. R. Burke has made the *What Cheer Reporter* an invaluable adjunct to his busy town.

His prediction regarding the present administration has proven only too true.

The *Register* of March 23d, contains the following which is highly complimentary to one of class '83:

The name of the writer of the interesting and valuable article on artesian wells in North Central Iowa, printed in last Sunday's *Register*, was accidentally omitted. It was Mr. S. F. Leverett, of Ft. Madison. Mr. L., who is a graduate of the Iowa Agricultural College, is an exploring scientist and geologist of merit and rising prominence. He has made some geological surveys or practical examinations in Iowa for the government, and his report will shortly appear in print at Washington. He is highly regarded by the officials in charge of this part of the government service and his reports are considered both reliable and valuable. This interesting and instructive article was a summary of one of his reports. We hope to hear soon from him in synopsis of other practical exploration of the state. He is a devoted and enthusiastic Iowan, and finds pleasure and pride in these investigation as to our material resources and scientific possibilities.

'85-84. We clip the following from the Ames *Intelligencer*:

MARRIED—March 29th, at the house of Mr. Ben Read, Mr. Alphanzo U. Quint, of Carroll, and Miss Anna E. Henry, of Ames, Prof. W. H. Wynn performing the ceremony.

Here is another interesting couple of

the number, increasing year by year, of life-long attachments contracted at the Agricultural college. We are inclined to feel an absorbing interest in each one of these occasions as they occur, but in this case there are reasons for congratulations specially warm and cordial. These two young people prosecuted the four years' course successfully at the College, relying in the main upon their unaided efforts, and taking in the end standings among the foremost. The bride is one of the most gifted women that the College has at any time sent out, challenging, indeed, the strongest competition from champions of the other sex. She is of the class of '84; the groom followed in the class of '85. During the interval the bride, in addition to duties of the school-room as teacher in our own city schools, carried through the difficult studies of a post-graduate course at the College, and won the degree of Master of Philosophy (M. Ph.), thus far the only lady graduate who has earned that degree. The career of Mr. Quint has been characterized by like energy, and has been rewarded by like success.

These young people enter life with the right spirit, "heart within and God o'erhead," and it is the most natural thing in the world to predict for them that degree of happiness and usefulness that are inseparable from the amount of character and genuine worth they have thrown together in their married estate. May long life, and a full proportion of realized hope be theirs.

There were present at the wedding only two invited friends in addition to the family of Mr. Read: Miss McCarthy, of Nevada, and Mr. Herbert Noland, of Ames. Mr. and Mrs. Quint left Monday for Carroll, where Mr. Quint had prepared a home for the reception of his bride, and they went immediately to housekeeping.

W.

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CHRISTIAN ASSOCIATION.

OFFICERS.

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J. M. Culver, Vice-President.
C. S. Bartholomew, Treasurer.
Florence Weatherby, Secretary.

MEETINGS.

Sunday School every Sunday at 1 p. m.
Prayer Meetings: Sunday evenings at 7 p. m., in College Chapel: Thursday evenings at 6 p. m., in Freshman Recitation Room. A cordial invitation is extended to all.

—o—

CLIOLIAN.

The Cliolian Literary Society is the only ladies' society in the I. A. C. This society holds literary sessions every Saturday evening. Its object is the improvement and culture of ladies in literary work. Visitors are cordially welcomed. Officers are as follows:

Lizzie Langfitt, President.
Esther Crawford, Vice-President.
Lizzie McCuskey, Recording Secretary.
Laura Moulton, Corresponding Secretary
Satie Pritchard, Treasurer.
Marion Watrous, Chaplain.
Ethel Bartholomew, Usher.
Ollie Wilson, Sergeant-at-Arms.

—o—

BACHELOR.

The Bachelor Society is the only exclusively gentlemen's society of this college. It was organized July 16, 1870. Its object is the mutual improvement of its members in Science, Literature, and Art of Speaking. It meets every Saturday evening, at

7:30, in Bachelor Hall. Its officers are:

M. Z. Farwell, President.
S. A. Beach, Vice-President.
William Peterson, Recording Secretary.
A. C. Felt, Corresponding Secretary.
W. S. Coe, Treasurer.
W. R. Myers, Chaplain.
W. B. Hunter and A. C. Felt, Sergeants-at-Arms.
Sherman Yates, P. M.

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CRESCENT.

This is a society admitting both ladies and gentlemen to membership. Its object is the improvement of its members in literary work and parliamentary law. Its sessions are held every Saturday evening, in Crescent Hall, to which all are cordially invited.

A. P. Johnson, President.
G. W. Sturtz, Vice-President.
Mary E. Fellows, Recording Secretary.
Florence Weatherby, Corresponding Sec.
W. L. Thompson, Treasurer.
J. E. Durkee, Librarian.
F. B. Dodd, Censor.
F. L. Dobbin, Usher.

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PHILOMATHEAN.

The Philomathean Literary Society is a society admitting to membership both ladies and gentlemen. Its regular meetings are held each Saturday evening of the college year. All are invited to attend literary sessions.

OFFICERS.

V. C. Gambell, President.
G. A. Johnson, Vice-President.
Lulu Wright, Recording Secretary.
Ella Henderson, Corresponding Sec'y.
Mabel Lucas, Chaplain.
G. A. Colton, Treasurer.
A. Brandvig, Sergeant-at-Arms.