

The Spectrum.

Published by the Students of the North Dakota Agricultural College.

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No. 8

The Northern Spy.

What the secret, Northern Spy,
Of the charm is, know not I;
This I know, thy witchery
Lies on me, will ever lie.

Cheeks as ruddy as the brands
Night uplifts from Day's spent hands;
Bended as the bow, and true
As any woodsman ever drew;
Juices that as grateful be
As the airs the unquiet Sea
Stirs the moon with; flesh as fair
As the wan gold of the hair
Combeth the Mermaid there.
Ah, Langnors of that Ancient Wine,
Whose soul slid singing into thine,
Come sing within this soul of mine.

Sing the song of old Omar:
Present joys be all that are—
Present joys whose only test
Beauty is, and wholesome zest.
Sing the secret, Northern Spy,
Of thy charm; I would know, I:

For I know thy witchery
Lies on me, will ever lie.

F. B. LINDSEY.

A SOCIAL EVIL.

The assassination of President McKinley seriously impressed upon the minds of the American people the fact that we have a new and growing evil to contend with.

Anarchy, as a social evil, is not so new when we take Europe into consideration, but from the standpoint of America, it is of comparatively recent origin. It is not that type of anarchy manifested by riotous outbreaks and mob violence that has so suddenly and seriously come to our notice and yet it is a type hardly less dangerous, because more insidious, manifested by stealthy individual attacks upon some ruler for the purpose of weakening or entirely destroying the government.

Anarchy, as we have come to know it, means, "the unfettered self-government of the individual." The anarchists want no form of external government. Their motto is, "Down with law! Away with order!" Hence they work in direct opposition to the common good and wishes of the great majority of people.

One of the teachers of anarchy has said: "Everything belongs to all." Another has said: "Property is theft." The principal desire of anarchy is to do away with all rulers, ministers of state, nobility, clergy and capitalists. With this end in view, anarchy has at last reached a stage of growth alarming to both Europe and America. These countries and especially America have come to recognize that something must be done to stop its progress. Parts of Europe have already placed heavy penalties upon these offenders of society, but America has never before legislated against them.

Anarchy is one of the evils of civilization, and is not common in despotic and semi-barbarious countries where one head rules supreme. Its first teacher, Proudhomme, began his writings in France, in the latter part of the fifties of the century just closed. His dictum was: "Governments are the scourge of God."

Since the days of its first author, anarchy has had both seasons of progress and seasons of decline. During the past eight years, it has shown the most serious manifestations all over the civilized world. During this short period Europe, South America and the United States, have all suffered from this terrible evil. During these eight years, eight heads of state, have been slain by anarchists.

The saying that "Property is theft" is of course a mistaken idea, for is it not one of man's greatest enjoyments to have the privilege of gaining and holding property? This very desire is one of the great distinguishing characteristics, of civilized, as compared with uncivilized, man. It would seem that the anarchistic doctrine, seeks to force men to an equal footing and keep them there, a condition that ethics show to be unnatural, a condition that can never exist as long as men differ in thought and real abilities.

The principal causes of anarchy are undoubtedly hard times, lack of employment and perhaps misdirected government affairs. It might be that the great causes are the real wrongs the poorer classes must suffer owing to the awful rush for wealth and the selfish and grabbing nature so characteristic of the present day. And yet, it is also

true that never before has so much been done to help the poor in our great cities as during the past fifty years and in spite of this fact, never before has anarchy manifested itself so universally. As regards the assassination of President McKinley, however, we cannot trace it to any of these causes, but rather to mistaken ideas resulting from anarchistic literature and lectures.

President McKinley was assassinated because the anarchists claimed that no one person ought to have so much power.

Lincoln and Garfield were not stricken down because of personal hatred, but because they were public officers.

Indirectly we are affected by the condition of anarchy in Europe. This has been repeatedly demonstrated during the past few years. Whenever the head of state in Europe is attacked by the element under consideration, the increased police activity there, immediately causes a rush of anarchists to this country. This was especially shown after the assassination of President Carnot of France, when it was known that several hundred anarchists at once set sail for America.

Says Senator Bunous: "The only certain cure for the evil is national legislation." But Spain has recently proved that the severest penalty is not always the best. This was shown in 1893, when the most severe penalties were imposed upon all those convicted of taking part in anarchistic gatherings interested in bomb-throwing. After many persons had been convicted and executed, bomb-throwing became more frequent. Up to this time, these missiles had always been directed against some officer either military or civic; but now as if in defiance of the laws, bombs were exploded at theaters and public gatherings generally, simply for the sake of destruction. It was after the severest penalties had been imposed on those connected with these

outrages that Prime Minister Canovas was assassinated. Not until the strictest police activity was brought to bear on anarchy so that its very breeding dens were discovered and its members deported from Spain by the hundreds did Spain finally gain relief.

In our own country, prominent senators have, at various times, reminded congress of the necessity of legislating against anarchy. The first bill was proposed after the assassination of President Garfield. This bill provided for the life imprisonment of any one convicted of taking or attempting to take the life of the president or any other person authorized to perform the duties of president. Other bills have since been proposed but the most important attempt at legislation was made in 1894, owing to the assassination of President Carnot. This bill provided for the exclusion and deportation of foreign-born anarchists, and a death penalty by hanging, upon any convicted of taking or attempting to take the life of the president or of any one in the line of succession. Neither of these bills was adopted; the latter passed the senate but failed to pass the house. Had the latter been passed it might have saved the life of President McKinley. Not that we could feel justified in supposing that a knowledge of such a law, would necessarily have caused the assassin to change his plans, but had such a law existed his plans might never have been formed. The law, if enforced, would have returned Emma Goldman to Russia and Most to the place from which he set sail for America, before either of them could have instilled into others their pernicious doctrine.

There is evidently no doubt that anarchistic literature and lectures are the great promoters of anarchistic acts. Suppressing the one ought to lessen the other: hence the question. Can this be done without hampering the

freedom of the press? It seems it can. So long as the great body of common people want order and look to the law for the maintenance of their individual rights, just so long shall we have the means of upholding the law of promoting its interests. A good method of procedure seems to be suggested by Senator Comas. "I would punish speaking and writing only when they directly counsel, incite or procure others to willfully kill the head of state." In other words, criticise if necessary but do not kill. Such a law would leave the press and public speaker in possession of all possible freedom so long as they did not seek to destroy the government.

Congress is likely soon to legislate against anarchay and it might be well to encourage the hastening of the day. But let us bear in mind that every effect has its cause, and every consequent, its antecedent. We might well ask ourselves the question whether legislation is the only means of ridding

the country of this social evil. Just as smoke indicates a fire; just as the noisome odor, the cadaver; so anarchy shows that there is something evil, something polluting, something deadly within our republic.

Would it not be well therefore, to arrange it so that when a disturbance is felt, when a great dissatisfaction is evident, that our officials investigate, and, if possible, determine the cause, so that if those who are causing the disturbance are in real need, steps for relief may be taken. We must not legislate to silence the cry of need under penalty of the law; but if investigation showed that the disturbance is due principally to the leadership of a few men of anarchistic principles, whose chief desire is to slay rulers and destroy order, then it will be the duty of our representative officials to take action against such felons, a duty which should be strictly attended to.

H. B. Schmidt, '02.

THE EFFECT OF A LOVE LETTER.

"Now, Mamie, you know there is absolutely no use in your talking this way about that young Percy. I cannot, will not, let you marry him. The idea of my daughter marrying a clerk from my store! Why, it's perfectly outrageous! I'm surprised, Mamie, after the excellent training you have had since your childhood, that you would ever let such an absurd idea enter your head."

"But, papa," pleaded Mamie, "Herbert is good even though he is only a clerk in a drygoods store."

"That doesn't make any difference," replied Mr. Dale, "now let me hear no more about 'Herbert,' as you call him."

But Mamie was determined not to let her father have the last word, so straightening herself up, she exclaimed: "You weren't always rich yourself, papa. You were only a clerk when mamma married you, and I am sure you have always been happy."

This was a fact that Mr. Dale could not deny, and for a moment he was at a loss for something to say, but he was determined to have his own way, so he replied, "But that was a different age than this. People had more sense then than they have now. They did not want to run off and get married the moment they left school. No doubt if you would wait a year or two you

would get all over this foolish, passionate love for young Percy, and want to marry some other fellow."

"I shall never want to marry anyone but Herbert," said Mamie decidedly, "and some day you may wish you had let me," with that she left the room.

Mr. Dale put on his hat and coat with a scowl, muttering to himself, that the little "minx" had more grit than he had thought. Then picking up some books from his desk, he started for his office.

Henry Dale was not as harsh a man as he seemed. He owned a large department store in New York, and by hard, earnest work had become wealthy. He had just one daughter—Mamie. She was a bright, amiable girl who had many admirers; but her preference seemed to be for a young man who worked in her father's store.

No one knew how they had become acquainted, but according to the old saying, "Love will find a way!" Mr. Dale did not know that Herbert Percy had ever seen Mamie, till one day the young man came to her father declaring his love for her, and asking for her hand.

Of course Mr. Dale was in a violent rage, as he had planned a far more brilliant future for his only daughter, than that of being the wife of a poor hard working clerk. So he told young Percy never to mention the matter, or he would not only lose Mamie, but also his position in the store.

At the time this happened Mrs. Dale was away from home, or possibly matters would have been different, for she was more judicious than her husband, remembering well when Henry Dale had fallen in love with her, and how opposed her father had been to their marriage. But as she was away now, Mamie had to fight her battles alone.

For two weeks matters went on in about the same way, Mamie going about her daily duties the same as

usual, and never mentioning the poor young clerk who was pining to see her. Mr. Dale was beginning to think that she had forgotten Herbert, and that he would have no more trouble with the two young people. But though he did not know it, there was a great deal of trouble in store for him.

One evening he came home in a great hurry, and sitting down at his desk, jerked up the lid, throwing out a confusion of letters and papers. He hastily gathered them up and stuffing them into his desk, continued his work. But as it was near supper-time he did not get much done. After he had eaten a hasty supper he sat down to his work again. As he pulled his chair up to the desk he noticed a letter lying on the floor. Supposing it was one that he had dropped, he stooped to pick it up. He was a trifle surprised, however, when he found that it was not his, for it bore the simple address, "Mamie." Mr. Dale was puzzled, and it suddenly occurred to him that the letter might contain something interesting, so he determined to open it and see. This is what he read:

"Dearest Mamie: Your father opposes our marriage only because of my station in life. He forgets that a number of great men were once poor. But, Mamie, you know that I love you, and I am convinced that you are willing to be my wife. Meet me in the garden tonight, where we can learn each other's thoughts. If we can't be married publicly we will be, secretly. Till then, adieu. Your affectionate lover.

Imagine, if possible, how Mr. Dale felt when he read this letter. He thought Mamie came running to see what was the matter.

"What does this mean?" he roared, waving the letter in the air.

"What does what mean?" said Mamie, frightened half to death.

"This abominable letter," shrieked her father. "Didn't I forbid you ever

speaking to that young rascal?"

"What young rascal, papa?" asked Mamie, bewilderingly.

"That scamp, Percy, of course," replied her father, "what do you mean by receiving such letters as these from him."

"You didn't, hey! Read that, then," said Mr. Dale, thrusting the letter in her face.

Mamie read the letter in utter perplexity, then handing it to her father, she said, "I never received that letter, papa!"

"Don't you dare deny it!" roared her father.

At this moment the door opened, and in walked Mrs. Dale.

"Oh, mamma," cried Mamie, rushing to her mother's arms.

"What, in heaven's name, is all this noise about?" asked Mrs. Dale.

"Noise!" said her husband. "Who wouldn't make a noise? Here Mamie has been getting love letters all along from that young Percy who works in

the store, and then she attempts to deny it."

"Let me see the letter," said Mrs. Dale. She took it, and read it carefully. When she had finished it, she laid it down on the table, then turning to her husband, she said, "My dear Henry, where did you get this letter?"

"On the floor, near my desk," answered her husband.

"Do you know who wrote it," she asked?

"Young Percy, of course," answered Mr. Dale.

"No; you did," replied his wife, laying her hand on his arm.

"I never did," cried the enraged man.

"Yes, you wrote that letter to me, twenty years ago," calmly replied Mrs. Dale.

Mr. Dale dropped limply into a chair exclaiming, "Well, I'm defeated! I had forgotten all about that.

"Marry Percy if you want to, Mamie, but don't ever mention love letters to me again."

Maria Calley, '05.

WHEN THE LEAVES FALL.

It was a beautiful April morning in the year 1876. The sun had just risen above the range of eastern hills and the birds were beginning to sing in the budding trees. The rivulets were gurgling and bubbling down the hillsides as if enjoying life anew after escaping the icy thrall of winter. From dozens of farm-houses the smoke was rising lazily in the air and curling about the tree tops like a thin blue veil. The balmy spring of Indiana was already beginning to clothe Nature in her verdant summer gown.

Down the long tree-lined lane that led from one of the farm-houses to the highway in the valley, a young man and girl came slowly hand in hand. He

was tall and straight like a pine. His brawny arms and chest betokened the son of toil, and his face, though dark and sunburned and devoid of that grace which is usually mistaken for beauty, had that charm which only rugged health and manhood possesses. His deep brown eyes looked out upon the world with all the sanguinity of youth, and with that fearlessness that is born only of a true and noble spirit.

The girl, on the other hand, though almost as tall as he, was frail and slender, and the delicate beauty of her face resembled that of some exotic hot-house flower, which if carefully guarded grows doubly lovely but which fades with the first blast of winter. She

was one of those beings who come into the world to be shielded from its storms and dangers by their fellow being and who doubly repay the trouble by casting sunshine on the clouds of life.

When they came to the end of the lane they stopped. He cast a long lingering look on the peaceful scene around them and on the old weather-beaten farm-house from whence they had come. Then he silently took her hand and his lips quivered as he manfully tried to suppress the tears that dimmed his eyes. At sight of his emotion, she too burst into tears, and thus they stood long, silently and with bowed heads.

He was the first to break the silence. Making a strong effort to compose himself, he said:

"Cheer up, Millie. Why should we be sad when all is joy about us? Even if I must go away, 'tis only for a short time. Now be brave. You know that it is to make a home for you that I go. See how the trees are budding, and hear how the swallows are twittering under the eaves. When the leaves turn yellow and the swallows fly towards the south, then I shall be back again."

"Ah, Jack," she whispered, "'Tis long till then. When the swallows are gone, I also may be gone."

A last embrace; a last sad farewell, and he sets out on his journey, his eyes fixed steadfastly on the path before him. He dares not look back lest his courage fail him. On the brow of the distant hill he pauses for a last look at her he loves so well. There, by the end of the lane, she is kneeling in the dust with her arms stretched out towards him as if entreating him to come back. A few more steps and she disappears from his view.

And thus he leaves her in the spring time of the year. Let us hope that when the grim Reaper reaps his har-

vest, he will spare the fair flower and gather only the ripened heads.

* * *

The broad undulating prairie lies dismally stretched out beneath the merciless glare of the bleak October sun. Not a tree is in sight save a few stunted willows around some water-hole in the hollows, and the Jamestown-Ft. Totten trail is only visible as a stretch of dull gray running off into the distance and finally lost to view in the withered grass.

A solitary horseman is seen making his way slowly along the road. It is the frontier mail bringing the weekly news of civilization to the garrison of the little fort by the lake. All day long he has been riding alone across the vast prairie, and now he heaves a sigh of relief as he sees the roofs of the distant fort glisten in the sunlight.

Suddenly he pulls his horse up, with a jerk that almost throws him on his haunches. His sharp eye has seen that speck of dark brown on the top of a distant rise and he knows it is a mounted man—but what? friend or foe? He takes the telescope that hangs by his side and carefully surveys the approaching figure. Evidently he is satisfied with his observation for he pays no more attention to the stranger.

The object of this delay did not seem to trouble himself in the least with the appearance of the mail carrier. He rode steadily along, at a slow canter, in a direction in which he would strike the trail at that little clump of willows about a mile ahead. Now he has reached the trail and starts down it towards the fort. As he passes the little grove there is a puff of smoke, a sharp report, then a loud shriek and the dull thud of a falling body, and a frightened riderless horse dashes down the trail while a lithe savage form flees swiftly across the prairie. The mail-carrier hurried forward. It was no use to try to run down the assassin, and

his only course was to see if he could help the victim. The latter was lying quite pale and still in the middle of the road but his heart was still beating, and the mail carrier hastily staunched the blood that was flowing from the bullet hole in his breast. Then he lifted the insensible man into his own saddle and set out for the fort.

He was soon met by a party of soldiers who had been sent out from the fort to find the wounded man. The coming of the riderless horse was the first intimation they had that there were Indians about. The wounded man was transferred to a litter and the journey resumed. On arriving at the fort, the burden was deposited on a cot and the post surgeon, a bluff, hearty Irishman, sent for.

He soon arrived and started to examine his patient, all the while talking to himself and to everybody in general:

"Arrah, me bye, and this is a noice fix to be gitting yoursilf into and no mishtake. Here he be; as noice and dacint a young gintleman as iver oi set eyes on, and what must he do but run up aginst wan av thim liden divils loike a foive year ould kid. Well, niver moind thot now. Let us see what we can do wid de pore bye. Ah, it's in the brist, is it? Now, thot's a bad place, oi've seen worse. Thir wuz Corp'r'l Kennedy of Troop K. He got a little friendly prick wid a knife in the same place, and sure and he wuz out on dress parade in less thin three wakes. This looks worse though. Ah—thot's the way the ball has gone. Well, thin oi give up. The verdic' is—death." And the cheerful little doctor started to pack up his instruments.

The patient had regained consciousness while the doctor was examining him. As he heard the last word he set his mouth hard, as if to gain control over himself, and then turned his face away. The chaplain came up to him and taking his hand bade him have

courage and not fear death.

"It's not that," cried the wounded man, rising on his elbow. "We must all die, and what matters a day more or stamped and fumed in such a manner less on earth? I am not afraid of death, but back home they are waiting to meet me when I shall come back—And now—I shall never come back. There is a girl there waiting for me. When I left home, she was the last one I saw. I left her kneeling in the dust by the roadside praying for me and I promised that I would come back when the leaves should begin to fall. Now I shall rot under the sod while she waits in vain for him who will never return."

One of the soldiers came softly into the room, handed the chaplain a letter and then walked out again.

"There is a letter for you," said the chaplain. "Shall I read it to you?"

It was only a short letter written in a weak, trembling hand.

"Dear Jack: when you get this letter I shall be gone. The doctor says that I can not live more than a week at most. The days are getting short and the leaves on the old elm outside the window are withering, but I shall not see them fall. Goodbye, Jack. I shall never see you again, but when I am dead and gone, think sometimes of the little girl you loved.—Your own Millie."

The dying man closed his eyes and smiled. In the west the sun was slowly sinking to rest, and its last rays were reflected on the clear waters of the placid lake behind the fort. A sudden gust of wind shook the trees and a few withered leaves came floating slowly through the air and then fell softly to the ground.

The doctor laid his hand on the wounded man's heart. It had stopped beating, but the smile still hovered on his lips.

They met when the leaves fell.

A. Mikkelson, '05.

Exchanges.

She: "Can you make two words out of 'enough' meaning not enough?"

He: "No, what are they?"

She: "One hug." Ex.

"The State Normal Magazine" is among our best exchanges. It contains several very well written verse compositions, together with two interesting addresses which were delivered before the student body.

"The Comenian" contains two excellent orations. One, the winner in the John Beck contest, deals with the negro problem in an interesting manner. The other, of a eulogistic character, pays tribute to our late president.

"The Purdue Exponent," of April 10, contains an interesting article on "The Effect of Labor Saving Machinery." The writer evidently believes in building an argument on sound footing for he begins with the invention of shoe making machines.

The exchange department of the "Normal Red Letter" is not up to the standard of the rest of the paper. It contains but two comments on other institutions of learning, the remainder being a collection of jokes, some of which are rather ancient.

One summer Mr. William Gillette, the actor, hired a yacht. As he describes it, it was a craft without a rival in slow progression. With a few friends he set sail from New York, and proceeded by way of the Sound upon a cruise. They kept close to the shore, and a week or two after they had left port were drifting lazily by a point of land, at the end of which sat a solitary man, fishing. In a few hours the boat had passed the point, and the fisherman was seen to rouse himself from his contemplation of his rod. "Where ye from?" he called genially. "New

York," replied Gillette, with a yachtman's pride. "How long?" "Sunday, August 1st." The fisherman returned to his fishing and the yacht kept on drifting. Some hours later there came a drawling voice over the quiet water, and it asked: "What year?"—Exchange.

"The Clemson College Chronicle," for April, contains several very well written articles. The short story entitled "A Freak of Fate" deserves special mention. The story deals with early colonial times and being so different from most college literature is exceedingly interesting. The editorials are interesting and not to be passed over lightly. The article concerning the "Boer Victory" certainly expresses the sentiments of a great number of the people of the United States.

It was at a dinner party. The bright young man found himself privileged to sit next to the young woman with beautiful arms and neck. He thought himself the most favored personage in the room. Suddenly his fair companion exhibited signs of nervousness. Two of his very best jokes, saved for a special occasion, passed unnoticed. Her face wore a look of alarm. Apprehensively, the young man gazed at her, and meeting the look, she said:

"I am in misery."

"In misery?" echoed the man.

"Yes," she replied, "I was vaccinated the other day, and it has taken beautifully. I could almost scream, it hurts so."

The young man looked at the beautiful arms, and seeing no mark there, said:

"Why, where were you vaccinated?"

"In Boston," she replied, a smile chasing away the look of pain.—Exchange.

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Editorial.

Arbor day was observed at the college on May 9th by appropriate exercises. After several papers and speeches and an abundance of good music, the various classes planted their respective class trees with all due ceremonies.

President Roosevelt has, on several recent occasions, demonstrated that he is a man of his own mind.

On May 5th, H. B. Schmidt, '02, delivered a very able oration on "A Social Evil" which appears in another department of this issue.

The several classes are hard at work on their commencement programs and so they should be for commendable results are the reward only of much labor.

The so called meat trust seems to be attracting a great deal of attention just now. The east is up in arms against the high price of meats and, no doubt, are justified in so doing, but we in the west are quite satisfied and will not register our kick so long as we can get six and seven cents for our live-stock.

It is strange indeed that the young people of Fargo do not take advantage of the opportunities offered at the Agricultural College, which is beyond a doubt, the leading educational institution in the state. Investigate and see for yourselves what we are doing in our several courses, namely, mechanical, science, chemical, literary and agricultural.

We listened to the High School debate of May 9th, with a great deal of interest and with some amusement. The debaters seemed to have their arguments memorized and no point which the other side made tended to change their mode of attack. Tim Francis deserves special mention for the commendable manner in which he defended his side of the question.

Fred Jensen took the special civil service examination on May 8 and 9, for the position of agricultural chemist in the Philippine service.

Much interest is shown by the farmers in their earnest inquiries regarding the flax problem, which has been so ably dealt with by Professor Bolley in bulletin No. 50. Many farmers are sending in samples of diseased flax and are much interested in the treatment and selection of seed.

From now on the chemical, biological and agricultural departments will each give a fellowship and the mechanical, agricultural, dairying, chemical and geo-

logical departments will each give a scholarship to post graduates. The fellowships draw \$250 and the scholarships \$125 per annum.

Merton E. Field, who received his M. S. degree at our institution, graduated with high honors, receiving his M. D. degree from the U. of Minn.

The College Cadet Band is doing excellent work and we expect soon to have the best band in the state.

Athletics.

This present baseball season is thus far the poorest in the history of A. C. athletics for the early training of a college team. However, the boys are still hanging on to their enthusiastic spirit and we can assure our baseball admirers that ere the season is over the A. C. boys will be in the lead.

Several practice games have been played with the Fargo High School in which games the college boys exhibited good skill in battery and handling the ball. Two weeks of fine weather will place our team in the field in fine condition.

On April 25, the regular college team had the audacity to present a challenge to the old time fans among the faculty. Not for a moment did the professional Has-Beens think that modern baseball tactics were superior to the medieval. The challenge was accepted; the game proved exceedingly interesting to the spectators.

The onlookers were unanimous in cheering Prof. Bolley as the star in the faculty team. He was undoubtedly the most nimble of the old timers. Jas. McGuigan, who was given an assistant position on the faculty team, proved a revelation even to his most ardent admirers.

The game was close and was it not

for Prof. Bolley's over anxiety to even the score undoubtedly the game would still have been 10 to 11 in favor of the regulars.

On May 8 the college team took a trip on the Fargo Southwestern to meet the Lisbon and Sheldon teams. The first to learn their fate was the Lisbon team. Although the weather was exceedingly disagreeable a five inning game was played to decide honors.

Croonquist and Greene, the battery for the college team, proved themselves stars, by handing Lisbon a shut out. By heavy work at the bat the college team secured two runs.

On the next day the farmers crossed bats with the Sheldonites. The battery for the A. C. was shifted and Greene did the tossing. The game was much more interesting than the previous one, as the day was pleasant and grounds were in fair condition. The farmers succeeded in running the bases for a score of eight while the Sheldon boys crossed the plate but twice. The Aggies were well pleased with their trip.

The college is now assured of having an athletic director and physical trainer. The athletic boys are rejoicing greatly over this fact. The A. C. can promise to be up with the best of them in all lines of athletics hereafter.

THE ASH INGREDIENTS AND THEIR FUNCTIONS
IN PLANTS.

(Prepared and read before the Chemical Club.)

To a majority of people, the soil represents nothing more than an inert and lifeless mass which serves merely as a means of producing various vegetable and cereal products, and thereby sustains animal life. In a vague and illy-defined way most men realize that somehow some soils are more suitable than others for the production of certain crops. The question of why this is so they never dream of asking—much less answering. Consequently, many of our farmers, either through ignorance of the results or utter carelessness, take no means of conserving the soil fertility, but by wasteful methods of farming impoverish the most fertile soils in a decade or two at the utmost.

As the soil is the storehouse of that agricultural wealth which has already brought fame to our state, it is natural that a study of its characteristics should be deemed important by those who recognize the desirability of maintaining its resources unimpaired. These people realize that the soil is but the visible product of indefinite ages of slow formation, gradual change, and persistent disintegration of rocks, which are the source of all soils, of whatever variety. The fertility of a soil which requires ages for its production should not be wasted in a generation.

Everyone understands that vegetation flourishes in proportion to the supply of food materials in the soil. All are aware of the vast difference between rich and poor soils in regard to their productive qualities, but few investigate the matter deeply enough to find the reason for this difference. To find this reason it is necessary to become familiar with the elements which

enter into the composition of the soil, their relation to each other and to vegetation, and the predominance of various elements or compounds in various parts of the soil. To one interested in the study of such things the soil ceases to be merely an inert and lifeless mass, and assumes almost all the properties of a living body. As the matter is further investigated we see how the elements of the soil enter into the composition of plants, and are there used in the building up of the roots, stems, leaves, flowers and fruit.

The ingredients of plants are divided into two classes, the fixed and volatile. The fixed materials, which form the ash of plants, are derived from the soil and are composed of oxygen, carbon, sulphur, phosphorus, silicon, chlorine, potassium, sodium, calcium, magnesium, iron and manganese. If to these we add hydrogen and nitrogen we have all the elementary substances which are found in important quantities in plants. Hydrogen is never found in perfectly burned ash. Nitrogen may be found in cyanides, united with carbon. The above mentioned elements form the principal constituents of all vegetation. A number of other elements are occasionally found in common plants or in some particular species of plant but they occur so infrequently and in such small quantities that their presence is not worthy of special mention.

The first chemist to advocate the theory that mineral constituents are essential to plant development was Humphrey Davy, who, in 1814, referring to the mineral constituents, said: "It has been generally supposed that these materials act in the vegetable

economy in the same manner as condiments or stimulants in the animal economy, and that they render the common food more nutritive. It seems, however, a more probable idea that they are actually a part of the true food of plants, and that they supply that kind of matter in the animal structure." Sprengel, in 1840, said: "We can accept it as an indisputable fact that the mineral matters found in plants also are real nutriments for them." The truth of these theories has been abundantly demonstrated by many later experiments, performed by chemists of world-wide reputation, who have spent years in research work along this particular line. To such degree of exactness has the work been carried that we know to what extent certain elements are necessary in plant life, how their absence or their presence in excess will affect the growth of different plants, which have not, as was formerly supposed, a highly developed selective power. Also, we know how plants rid themselves of excessive ash materials which they may have absorbed. These, and a great many kindred points, have been elucidated by modern experimenters.

While all people recognize, in a general way, that plants secure their food from the soil, we rarely find that the people consider the method of its procurement as of much importance. When we consider the economic value of a knowledge of the methods by which plants procure this sustenance, and the value to posterity of the food material conserved in the soil owing to this knowledge, we should fully realize its importance.

Different varieties of plants contain the same kind of ash in different quantities, and in similar plants the quantity of ash of a certain variety differs in various parts of the plant. Some forms of vegetation contain a predominance of one particular kind of salt, even while the plant be surrounded by a solution which contains a predom-

inance of a different kind of salt, as the sea-weed, which, surrounded by sodium, has a predominance of potassium.

Some ash materials, as silicon and calcium, are taken up by plants to give strength and rigidity to the stem, and at the same time these materials take almost no active part in the nutrition of the plant. An investigation of the causes, of these results brings us only to a further realization of the wondrous workings of nature in building up plants, and almost makes us despair of ever fully comprehending its full significance.

The various ash ingredients existing in the soil are dissolved by waters percolating through the soil. Roots and root-hairs of plants, coming in contact with the soil-water, absorb it by osmosis, and also owing to the pressure exerted against the root-hairs. Thus is the ash material supplied to the plants, or at least to the outer layer of the cells of which the plant is composed. Here we find that latter-day experimenters having fully investigated the so-called selective powers of plants, have come to the following conclusion: Plants, contrary to general opinion, have not any selective power. Any ash material dissolved in water may be taken into the plant by osmosis or pressure, that is, into the external layers of the plant cells. If, however, the plant does not use the material, it is taken no further, but if the plant take the material to use in its growth, and transfer it to cells more remote from the source of supply, then by osmosis the amount existing in the outer layers will be increased until of equal proportion with that existing in the soil-water. These conclusions, though they may appear to the lay mind as more of a technical hair-splitting than otherwise, are in reality of great importance in the study of plant growth.

The water taken into the plant is diffused throughout its structure, but not

without system, as may be supposed. As a general rule, there is an upward current to the leaves, where the bulk of the water is given off as vapor, while the contained ash materials, after being transformed by sunlight and oxygen are transferred to those parts of the plant in whose upbuilding they are concerned.

Taking the various ash elements individually, it may be interesting to give a brief summary of their occurrence and connection with plant life, bearing in mind always the fact that in different plants the same element may have a different effect, as well as being present in varying quantities. Also that in different parts of the same plant the same element may occur in differing percentages.

"Oxygen is an ash ingredient, as it unites, with all the elements of vegetation, excepting chlorine," either during the life of the plant, or by combustion in decaying or during analysis. It unites with carbon, sulphur, phosphorus and silicon, forming acid bodies, while with the bases it unites to form oxides. Carbon in the free state is a solid, existing in various forms, as graphite, coal and diamonds. In the preparation of charcoal from wood by incomplete burning we have evidence of its existence in large quantities in the woody part of plants. The carbon supply of plants is obtained principally through the atmosphere, as carbonic acid. It has been found by experimenters that plants can be brought to full development without the presence of carbon, except such as is supplied through the atmosphere.

Sulphur is an element which occurs in all soils in the form of sulphates, or compounds of sulphuric acid with some metal. Of these compounds the most important is perhaps the superphosphate of lime, which is used in enormous quantities as a fertilizer. Salts of sulphur are found in the sap

of plants, and in the ash when the plants are destroyed. Sulphates occur in different parts of the plant at different times. Thus, Arendt, examining the cat plant after blossoming, found about seven per cent of the fixed ingredients of the upper leaves consisted of sulphates. Clover leaves have been found to contain thirteen and seven-tenths per cent of sulphur as fixed matters, when destitute of sulphates. Sulphur also occurs in almost all plants, in the form of albuminoids. These albuminoids, which are composed of carbon, oxygen, hydrogen, nitrogen, a small quantity of sulphur and occasionally phosphorus, attain the highest percentage in leguminous crops in which they have been found as high as twenty-four per cent.

Phosphorus is an element having such affinity for oxygen that it is not found in the pure state, but as phosphates, or phosphoric acid with the hydrogen wholly or in part replaced by a base. In plants we find phosphorus occurring as phosphates of calcium, magnesium, potassium and sodium. The chief value of phosphates in plants consists in their ability to form water-soluble compounds with albuminoids, and thereby materially assist in their translocation in the plant. Albuminoids, in the pure state, penetrate plant membranes very slowly.

According to recent investigations carried on by the U. S. department of agriculture, phosphoric acid is absolutely necessary in the formation of the most essential constituents of the nucleus and plastids. It also assists plant growth by stimulating cell-division, in fact it is absolutely requisite for that process. Phosphorus occurs in the seeds of plants as potassium di-phosphate. To demonstrate the necessity of phosphorus in plant growth, the department of agriculture carried out experiments with two water-cultures, one containing all necessary ash ingre-

dients excepting phosphorus, the other containing that element also. The culture free from phosphorus became pale yellow in color, owing to lack of chlorophyll formation, and growth ceased, as cell division in absence of phosphorus was not carried on. After eight weeks some phosphorus was added to the solution, and the plant immediately began to assume healthy normal proportions.

Silica, which is extremely insoluble, is usually found in the ash of plants in combination with alkali metals or calcium. In the plant it is supposed to exist in the free state, and is always found in plants which grow in natural soils. It is more abundant in plant leaves than in the straw of the stems. Silica accumulates in older and less active parts of plants, and is not so conspicuously present in young growing plants as in the more mature. The chief use of silica in plants seems to be in affording rigidity to the stems and in forming defensive coatings. In some plants it forms as high as ninety-six per cent of the entire ash. While its presence is not necessary to plant growth, it is, as a rule beneficial. One beneficial effect of an abundance of silica is the production of a maximum amount of seed.

Chlorin exists naturally as a gas, but dissolves in water, forming a yellow solution. In some form chlorin is present in all plants. While it may not be absolutely indispensable, but a very small portion of it is necessary to plant growth. It has been found that chlorin is particularly helpful in seed formation. Plants grown without chlorin are of apparently normal conditions until the flowering season. Then the tips of the plant fall off, and the epidermis bursts, no seed being produced. An excess of chlorin is harmful in assisting in dissolving starch, and thereby carrying it away from organs which are dependent upon it for functional

abilities. In moderate quantities it assists in the transfer of starch throughout the plant.

Potassium and sodium are so closely alike in physical and chemical properties that they may be considered together. Potassium is a necessity for every living plant, being found in all. Sodium is found in practically all. Potassium must be present before starch can be formed, in the plant tissues. Sodium, on the contrary, is not indispensable, as many varieties of plants have been raised to maturity and found normal in the absence of sodium. For many years there has been much discussion as to whether sodium could replace potassium in plants, or fulfill the functions of potassium in absence of that element. According to the results derived from a series of experiments carried on at the New York experiment station, "Sodium can not replace potassium as an active agent in the development of plant life." A recent bulletin of the U. S. department of agriculture assumes the physiological superiority of potassium to be due to its power of chemically condensing other chemical substances. The writer of the article in question believes this condensation to be "Of prime importance." Potassium is held to be a necessity for both plants and animals, and numerous instances may be cited to show its indispensability. Suffice it to say that, as soon as potassium be removed from a plant's supply of food, "Every physiological function comes to an end."

Calcium has been demonstrated to be a necessity in the formation of cellulose, of which the cell tissues are composed. By withholding calcium in water cultures, the stems of plants are wilted, and the plants die. Magnesium bears such resemblance to calcium in time it was generally supposed that its general characteristics that for some magnesium could replace calcium, but this supposition has been proven false,

and from the observation of experiments the following conclusions have been reached. 1. Calcium and magnesium are present in every plant, in all its parts. 2. Leaves contain relatively more lime and the seeds relatively more magnesia than the other parts of the plant. In some plants calcium deposited as an incrustation, thus showing it to be taken up in excess of the requirements of the plants. The calcium in the calcium phosphates is held to be as important in cell division as is the phosphorus.

Iron, as is generally known, is necessary to the production of chlorophyll, which is one of the principal manufacturing agents of the plant, assisting in the formation of the food products by the formation of carbon dioxide. A spraying of ferrous sulphate has been found to hasten the ripening of fruit,

and also to increase its size, probably to stimulation of the protoplasm.

Plants have been raised to normal maturity in absence of manganese, but in the ash of plants manganese is sometimes found to exceed the iron. Iron, however, can not be replaced by manganese.

These are the conditions which influence crops generally. To understand particular cases we must first make a study of the prevailing conditions, character of the soil, etc. After so doing we may form a fair conception of the case in consideration. This gives but a brief view of the scope of agricultural chemistry, whose field is the world, and whose students should be all those who assist in the production of the world's wealth, which comes ultimately from the soil.

J. McG.

Local Happenings.

LOCALS

Base ball.

Money talks.

Class of 1902.

Black and Blue!

Who threw that?

I am disappointed.

Where shall we dine today?

The Freshman dinner was given Friday, May 9.

It is reported that Mrs. Ladd is now an official member of the choir.

The much needed walk is being put in between the creamery and Science Hall.

The new college catalogue will be out in a few days with several changes in the courses.

Arrangements are being made to more thoroughly equip the different departments in Science Hall.

He is as fresh as the month of May.

The Freshman is always a first class fellow.

Only stupid people complain of hard work. The smart ones never overwork themselves.

Professor B.: "This skeleton ought to be one rib short if it is a man's."

Brilliant Junior: "Honestly, ought it?"

This is what the Seniors say: One Senior equals six juniors; one Junior equals six Sophs; one Soph equals six Freshmen. Therefore, the Seniors are it.

Professor Mills: "What does a-n-t-i mean?"

Student: "Against."

Professor M.: "And what does a-n-t-e mean?"

Student, twisting about uncertainly: "I guess it's some kind of a game."

The next meeting of the representatives of the Experiment Stations will be held in Atlanta, Georgia, late in the fall. Professor Bolley feels pleased over the prospects of a trip through the southern states.

Much to the sorrow of the Sophomore class, Mr. Jaberg was called home and is unable to return for the spring term. Mr. Jaberg is a valuable member of the class and it is hoped that he will return next fall.

THE 1905's HOP.

Friday, April 12, was the date set for the Freshman "Hop" and no effort had been spared to make it a most enjoyable event.

Even the Preps. joined in to help make things interesting and as they had suffered some injustice at the hands of the Freshmen at some previous date, they deemed this the proper time and place to avenge the wrongs done them. They, therefore, quietly agreed to meet at the main building on the night of the dance to carry out their deep designs.

As the appointed hour for the dance drew near, the Freshies and their ladies began to put in appearance. On passing the main building they were greeted by the Preps., who had chosen part of their number to escort the ladies to the dance-hall while those remaining seized and bound the Fresh gentlemen and put them in cold storage. Thus were the haughty '05's gathered in one by one and two by two. The Preps., after taking up the slack in the binding ropes, felt confident that their enemies would cause them no trouble. Leaving three of their number on guard the remainder repaired to the armory and took possession of the dance. It is doubtful if the Freshmen themselves could have made more charming hosts. In order that all Preps. could enjoy the festivities those on guard were relieved at definite intervals.

Everything was proceeding with uninterrupted smoothness in the dance-hall while trouble was brewing in the

guard-house. Two of the Freshmen, who well deserve the name of contortionists, worked loose from the tightly bound ropes so quietly as not to excite the suspicion of the guards. When both were free they sprang up, armed themselves with chairs and drove the Preps. from the building. They then quickly released their class-mates and all rushed for the Armory. They were met in the hall by the Preps. and "rough-house" is a mild name for what took place. Blood flowed profusely and as the forces were quite evenly matched, it was an exciting, yet pleasing, sight to the uninterested classmen. And so they "fit" and fought and the outcome seemed quite uncertain. It is said that a student is not worthy of belonging to a class unless he can handle two or more of his lower classmen. The Freshmen evidently had this in mind and used their "dukes" in such a fashion that the Preps. were obliged to tear for the tall timber with no desire to return.

The Freshmen, though very much worse for wear, succeeded in putting themselves in presentable condition and after assuring the frightened co-eds that all was well, the music again struck up and the Freshman dance began. From then until the guests took their leave, the entertainment proceeded without a hitch.

The Freshmen are entitled to much credit for upholding the dignity of their class against such odds.

But wait till the Sophs. get after them!

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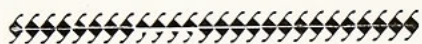
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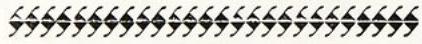
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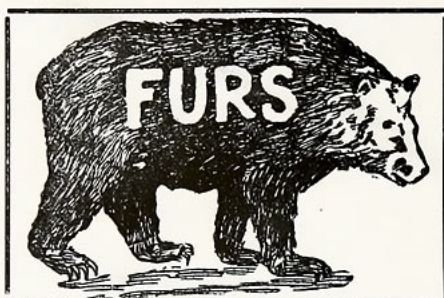
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