The Spectrum.

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A Plea for Scientific Education.

The value of a classical education is a question that has long been under discussion among the most prominent educators and business men of America. Until very recently, however, very little had been done in a specific way to prove that a classical education is or is not an advantageous investment of time and money.

In January of last year Mr. R. T. Crane, a hard-headed, practical business man of Chicago, published the results of his investigations of this matter. In his book on the utility of education for business men, he takes the stand that a college graduate who has to earn his living and who intends to pursue a commercial life is not benefited in the least by a classical education. Although Mr. Crane has made some startling assertions, he has perhaps proved his statements because he limited himself to a narrow, one-sided argument. He contends that should a young man, instead of attending college, serve a sort of apprenticeship for the same length of time in any business office, he would be better fitted to conduct a business establishment. Few people will endeavor to disprove this statement, for it is a self-evident fact that any boy of average intelligence, after serving six or seven years as an apprentice in a business office, must know that business from the ground up; whereas the college graduate has learned very little of business affairs. It is equally self-evident, however, that the college man will have a far reaching knowledge of the world and of life in general, while the apprentice will necessarily be narrow and circumscribed in his views.

Notwithstanding the fact that Mr. Crane has pretty conclusively proved that all education above the grammar grade is rather a luxury than an absolute neccessity to a business man, the people as a whole are not prepared to see the American college become extinct. We must have men who are able to see more than the glitter of the dollar, or in spite of the progress of the past hundred years we should eventually deteriorate into the deplorable condition of wealthy ignorance. The college will live. Every man who has had a college training is and will always be a factor in promoting and giving life to college work.

Now the question arises "What is education"? Does it consist in spending a certain prescribed number of years in the study of literature, art, and the various branches of abstract science, such as philosophy, and metaphysics; or does it consist in understanding nature's laws and the ability to apply them to everyday life? In other words, who is the most truly educated man, the classicist or the scientist?

If we compare the lists of subjects taught in classical institutions, such as Yale, Harvard, Columbia or Dartmouth, with those taught in scientific institutions, of which nearly all state universities and technical colleges are examples, we find that they are essentially the same. The methods of teaching these subjects are, however, vastly different. In classical institutions great stress is

laid on the study of languages, ancient and modern, and on all subjects that are intended to increase the appreciation of beauty and sublimity; while the natural sciences, such as chemistry, botany, and geology, are taught largely by means of lectures—a very inefficient method at best. In scientific institutions the reverse is generally the case. All branches of scientific research are developed as broadly as possible, making the study of languages, with the exception of English, French and German, a subordinate feature.

Since the scope of knowledge is so broad that no one person could possibly know everything, it rests with each one of us to choose between these two methods of education. Which shall it be? It should be the one that will be of most value to the individual in later life. Education is not solely a matter of dollars and cents, for the purpose of education is to give its possessor an appreciation of beauty, and an understanding of natural phenomena; but it must also be a knowledge that may be turned to good advantage in earning a livihood, if necessary.

A scientific education will give us this help. The study of natural science opens our eyes to the phenomena of the world we live in more than Greek mythology or metaphysics could ever do. Only to the scientifically trained eye, indeed, does the real beauty or sublimity of things become revealed. The mountains which the ancient psalmist referred to as everlasting, are grander still when we think of them as only temporary in the world's history. Do you think that these extensive prairies and ancient shore-lines of old Lake Agassiz call up in the mind of the classicist as much poetry as they do in the mind of the scientist who knows their cause? The truth is that those who have never entered into scientific pursuit know not a tenth part of the beauty with which they are surrounded. False, indeed, is the current opinion that science and poetry are antagonistic.

The study of science, besides promoting a just appreciation of the beauty and sublimity of nature, develops in the student a habit of careful investigation. As soon as one begins to learn the methods of natural science, he feels a strong desire to investigate further. He begins to realize that his range of knowledge is small indeed; that there is much to learn outside of his own little sphere. Many of his fantastic ideas are abandoned and new and correct conclusions are drawn.

The scientific education, indeed, is but a continuation of what begins, however crudely, early in every child's life. When the boy, out of what is usually called childish curiosity, asks his father why the moon always follows him or why iron sinks and wood floats, he shows the latent desire for scientific investigation. Should the father, as many fathers do, tell him not to ask such silly questions, he has done the boy a great injustice. He has dampened the eager desire for investigation and for that boy "Nature's feast is spread in vain". Let the child wonder and ask questions. Let him investigate, for it is this childish curiosity which will later develop into the habit of painstaking, careful observation.

The study of the sciences, however, cannot be looked upon as a diversion. It is as much a mental training as the study of the classics; moreover, it requires the exactness of mathematics. The student cannot be satisfied with vague or poorly defined statements. His knowledge must be well defined and expressed in clear and precise language. Such scientists as Darwin, Goethe, Huxley, and Spencer, were masters in the use of language. Their works contain some of the most definite, clear-cut statements of facts and the most beautiful poetic allusions that their mother tongue is capable of expressing.

The study of natural science, besides developing habits of exactness, teaches conservatism in drawing conclusions. It develops a wholesome skepticism which leads the student to place reason above

authority. Yet it is by no means irreligious, as the classicist is often inclined to believe. It is rather the twin sister to religion. Herbert Spencer says: "Devotion to science is a tacit worship; a tacit recognition of worth in the thing studied. It is not a mere 'lip homage', but a homage expressed in actions; not a mere professed respect, but a respect proved by the sacrifices of time, thought and labor. Doubtless to superstitions that pass under the name of religion, science is antagonistic, but not to the essential religion which these superstitions merely hide. Doubtless, too, in much of the science that is current there is a pervading spirit of irreligion; but not in the science which has passed beyond the superficial into the profound".

Science is the foundation of all the progress of modern times. Had it not been for scientific investigation, many of the comforts which we now enjoy would be unknown. The discovery of our antiseptics and anesthetics are due to scientific research. The present system of caring for the sick in our hospitals is founded on the application of scientific principles. Although science has done much for man in relieving his suffering and increasing his pleasures, not the least of its many benefits is the fact that it enables him to work, not against, but in accord with natural laws. It is the foundation of all technical pursuits. From institutions of applied science come such men as Felton, president of the Chicago and Alton Railroad—men who build the nation's commerce and industries, and yet are able to see beauty in the world around them. From the chemical laboratories of the schools of science, Mr. Crane to the contrary notwithstanding, come the men who have made the steel industry and beet sugar manufacture what they are today. If this were not true, these mammoth establishments would not equip such magnificent laboratories for experimental work; they would not employ as many chemists and physicists as they do.

When we look back over the progress of the past hundred years and compare what the classicist has given to the world with the contributions of the scientist, it is not strange that we consider the scientific education of far more value in every sense of the word than the classical. We are compelled to believe in the light of modern experience and present day needs that the scientist is the more truly educated man.

E. M. MAY, '04.

There's Sabbath at the Heart of Things.

I know it by the twilight hush,
The trance that follows evening's flush,
By hill and dell that, leaf-bestrewn,
Slumber beneath the autumn moon.
From breathless heavens the cloud-filmed night
Silvers it forth in pensive light;
And every star the message brings:
There's Sabbath at the Heart of Things.

I know it by the storms that die
In the large quietude of sky;
By frenzied cataracts that strain
To reach the vast, untroubled main.
Yea, if I read the blue aright,
The meaning of its starry night,
And catch the song Creation sings,
There's Sabbath at the Heart of Things.

—G. E. HULT.

Philip's Experiment in Physics.

Philip Norton rushed excitedly into the small house occupied by the Norton family.

"Harrah for Wheels"! he shouted. "He's a bully fellow".

"Philip", said his mother reprovingly; "you should not speak so of your teacher. It is disrespectful". "Well, he is kind of queer", responded Philip, "always monkeying with machines and things that he makes himself. But anyway, he's a jolly good fellow".

"What is the cause of this enthusiasm"? smilingly asked his mother.

"It's like this", replied Philip. "Last term we were supposed to take physics, but the books did not come until it was too late to use them. All the fellows thought that we would have to wait till next year before finishing the subject, when up steps the prof. and offers to give us an hour of his time in the afternoon on condition that we promise to study hard".

On the arrival of his father, however, Philip's ardor was considerably cooled. When he asked him for enough money to pay for the book, Mr. Norton replied curtly: "No, you don't get none of my cash to waste on such trash, and since you've got so much time to spare, you can go up town and get a pane of glass to put in the chicken house in place of the one you busted the other day".

Mr. Norton, although fairly successful, was an uneducated man. He believed that anything outside of the most common branches of study was entirely superfluous. It was through his mother's influence that Philip was allowed to attend the higher grades at all.

Philip was angry. "Darn it"! he said, "I'll go without a book"; and fortunately, as you will see later, he lived up to his resolution.

One sunny afternoon about two days after this, a small fire was discovered in the side of the chicken house nearest the kitchen. As that side of the hennery was built of glass after the fashion of a green house, it was easy to see the interior from the kitchen window, and that was the way the fire was discovered.

The fire was soon extinguished, and the little damage, consequent to the blaze, repaired, but the origin of the flames remained a mystery.

The next day the sun shown bright, and Mr. Norton sat on the back steps enjoying the balmy air. He gazed complacently at his commodious hennery, and thought how much better it was than his next door neighbor's.

Suddenly, without the slighest warning, a tiny flame leaped up from the floor of the object of his meditations, in exactly the same place at which the fire had originated on the previous day.

"Holy smoke"! yelled Mr. Norton, and then he made a dash for the scene of action. The judicious application of a pail of water soon quelled the disturbance, and Mr. Norton was preparing to go to the house when he noticed that steam was rising from the floor in one particular spot. Even while he watched, the boards grew dry and then began to smoke. Mr. Norton was mystified. Like most ignorant men he was intensely superstitious, and when the wood burst into flame it was more than his nerves would stand. He made his exit with a flying leap and an eruption of profanity which rivaled the lurid glow of the flames.

As Mr. Norton took his leave in this summary manner, he upset his son who was on the point of entering the hennery.

"Get out of my way"! yelled pa, and sprinted for the house.

Philip had arrived from school in time to witness his father's queer antics. He was just coming to his assistance, so he scrambled hastily to his feet, entered the hennery and put out the fire.

Like his father he noticed the peculiar way in which the steam rose from the floor. He also observed a small circular

spot of light which seemed to be the center of the disturbance. Then he looked sharply at the pane of glass which lay directly between the sun and this spot of light and saw that the glass at one place bulged out to a marked degree. To the youthful student of physics the mystery was a mystery no more.

Philip deliberately kicked the pane into a thousand pieces, and then started for the house at about the same gait his father had struck. As he entered the the door he heard his father say: "Yes, Mary, I'll tear the blooming thing down. I know the blame shebang is haunted".

"Don't demolish the structure until I make a little explanation", said Philip grandiloquently. "Our physics states —and we have verified the statement by experiment—that a circular piece of glass, having two convex surfaces, is capable of converging the rays of light received from the sun. The concentration of these rays at the focus, or the point at which the converging rays meet, produces heat enough to cause combustion, if any combustible material is brought into contact with the focus. Through some flaw in the process of manufacture, the pane of glass with which father replaced the one I broke, had a perfectly formed burning glass near the center. This pane was so placed that the focus of the burning glass was brought into contract with the floor of the hennery, and combustion was the result".

Mr. Norton gazed at his son in admiration. "By George"! he exclaimed, "I couldn't understand any more'an about half of that". Then he reached down into his trousers' pocket and drew forth a five dollar bill.

"Here", he said, "take this, buy your book, and keep the change. And say, you might bring your book home and give me a whack at it".

CHAS. W. VAN HORN, '07.

The Cell.

(The winning prize essay the in Lavoisier medal contest.)

The XIX century, crowned with the success of the ages, has passed into history. Handicapped by the ignorance of the preceding centuries, its victory has been the more glorious because of the marvelous work it has accomplished in overcoming prejudices of the past and in arousing the thinking world to a practical and sensible view of life's problems. The XIX century has awakened the aesthetic nature in man. He sees the beauties of the world about him. His admiration aroused, his curiosity concerning the why's and wherefore's of these phenomena have naturally received a stimulus. This has led him to investigate for himself, and the result is his extensive knowledge of nature and her secrets.

Life, the prime factor of nature, is still a mystery to man. It is the mystery of mysteries. All around us it is manifesting its presence, particularly in spring, when all nature is awakened after a long winter's sleep. The grass turns green, the trees bud out, the flowers appear in the fields, and the birds make known their arrival with songs—all announce to the world the advent of a new season. "Everything is happy now, everything is upward turning" to that unseen power which thus manifests its presence.

Life is the center of it all. Biologists have for a long time studied and observed living organisms and, as a result of their investigations, are able to give a most learned discourse on the anatomy, morphology and physiology of life, but the vital principle—life itself—

is a problem for coming generations to solve.

The scientist is now able to read the life history of any plant or animal known to the world. The greatness of this achievement reached its climax when man through his ingenuity constructed the microscope and used it to work out the life history of organisms too minute to be seen by the human eye. Very simple, indeed, he found these organisms, and yet how complex—complex in action. The amoeba, the simplest of all animals, he found as a minute speck of soft jelly-like protoplasm, undifferentiated and surrounded by a simple cell wall. Simple in structure, but what powers it possesses! As it moves through the water, it is seen to feel its way along, to engulf, as it were, into its body particles of food and pass by non-foods; to assimilate and reproduce. This simple animal has passed through the cycle of life. Science, indeed, has a difficult problem before it so long as it attempts to solve the mystery of such actions. From the simplest structures of prehistoric times have developed more complex organisms; and the single cell has been replaced by a multitude of cells—all essential to the life work of the individual—until the most perfect and the most complicated of all was reached—man. The complexity of this structure, however, has but increased the difficulty of solving this interesting problem. With increased complications, differentiation is the more marked. Each cell has its individual work to do, but also co-operates with every other cell to maintain the health and life of the individual.

If a piece of food be traced in its journey through the body, the cells are seen working at their best. Any stimulant entering the stomach causes a secretion of the gastric juice. This is a normal product of the cell which secretes and empties it into the stomach to aid in digestion. The cell secretes only a definite amount and only for a certain length of time. If the food be unpalatable, the cell fails to respond to the stimulus and the food passes on undigested into the intestine. Here another set of cells are stimulated to action; some, to secrete further digestive fluids and others, to absorb the food and pass on the undigested pigment particles. The circulating cells of the blood pick up the absorbed food from the lymph and carry it throughout the body. As the blood rushes along bearing its burden of nutrition, the cells which it visits pick out certain constituents of the blood, alter them by processes of synthesis and decomposition, and send some of them into the ducts of the glands, and others back into the lymph and blood.

And so it is with every part of the body, the eye, the nerves or any other organ—this mysterious power of the cell always manifests itself.

Physiologists have worked out the form, structure and function, but what constitutes the vital element they have not yet ascertained. Physicists offered at one time seemingly plausible theories based on osmosis, diffusion, filtration, etc., but at the present day all these theories are wholly rejected. The physical activities, that is to say the motions, characteristic of life, result through chemical processes of analyzing and synthesizing of foods taken into the body. It is the chemist's duty to determine the elementary constitution of all secretions and products of the body. Broad and important as is the work of the chemist, it is hopeless for him to attempt any explanation of this perplexing problem. The vitalist would fain solve the difficulty by attributing it to a vital force; but Mr. Bunge, an authority on physiological chemistry regards "vital force as only a convenient resting place where, to quote Kant, reason can repose on a pillow of obscure qualities". Accordingly we are still at sea, unless we accept the theory of the psychologist which is steadily gaining ground. We are not to conceive of our internal world, the world

of consciousness, as necessarily and entirely bound up with certain parts of the brain. Our consciousness arises by inheritance through a simple cell, from which by repeated division, all the cells and tissues of our body are produced, including those of the brain and cerebral hemispheres, and other parts of the nervous system. Now the history of the evolution of function must run parallel with that of the evolution of structure. We cannot indeed suppose that, as we trace the animal kingdom downwards to the unicellular organisms, the conscious life of the individual ceases at that exact point where a brain is no longer present, or even where we can no longer distinguish a specially differentiated nervous system. May it not be possible that every cell and every atom is really a conscious being and that all life is a conscious life?

Be that as it may, certain it is that the little cell, all unconscious of its importance, continues its life work of producing or reproducing, building up or tearing down. To the physiological chemist the world is indebted for the knowledge concerning these activities of the cell. For he alone before all other scientists is able to determine its constitution, and hence by the laws of chemistry, its origin.

The food we take into the body is for the most part in an insoluble form, and its composition differs oftentimes very widely from that of the tissue it is intended to repair. It becomes the work of the busy little cell to change this material that it may become suitable for nourishment. Conscious of its duty, if we may so term it, the little structure attacks the food first by means of an acid secretion, the gastric juice, which digests much of the proteid; and secondly by means of the pancreatic, intestinal, and bile juices in the upper intestine, which, being alkali, neutralize the acid action of the stomach, and carry further the digestion of such foods as sugars, starches and fats which the gastric juice failed to act upon. These juices effect chemical changes in all classes of foods and prepare them for absorption. The proteids are peptonized, starches are split up into soluble carbohydrates, the fats into glycerine and fatty acids. Having performed their duty by the secretion of digestive fluids, these cells remain quiet until further stimulated. The process of digestion is taken up by another band of workers. These digested foods must be absorbed and distributed over the body. The proteids in their passage through the intestinal wall are attacked by some cell or cell product—no one knows quite which—and forced to undergo further destructive metabolism. Otherwise it would be too complex for use in building up tissue. If necessary, the proteid may perform a two-fold action, it may simply renew the tissue, or act as an energy and heat producer. The fats and sugars separated out and absorbed in the intestine may aid the proteids by acting as fuel, thus producing the necessary heat.

This is but a synopsis of the normal workings of the cell. In reality, many external circumstances co-operate to alter the normal functions. The little cell, however, ingeniously protects itself from abnormal conditions, if not too severely taxed. Many poisons find their way into the system either by food or by bacteria. Manufacturers of the present day, in preparing their foods for the market, do not hesitate to add preservatives of different kinds to the foods. Some are harmful, others not, but nevertheless when foods prepared in this way find their way into the body, they produce abnormal conditions. Usually the cell is able to protect itself against injury through secretions which counteract the poison, or it may eliminate the body unchanged. Poisons produced by bacteria are dealt with in a similar manner. Nature is provided with a limited means of protection. If the cell is unable to meet and conquer the intruder, it adapts itself to the new environment and performs

its normal functions unhindered. This is sometimes true of bacterial poisons: the cell becomes so accustomed to the existing poison that it may render the body practically immune to any serious results from that particular poison.

Science indeed has accomplished a great and important work in investigating and working out the life process of the cell. We have made but a beginning in this great field; there are yet many discoveries to be made and problems to be solved. The XX century has much to begin with, and so even greater victories should crown its closing years than was ever dreamt of by the XIX century.

MABEL LEININGER, '03.

Science Notes.

"One of the most interesting phases of recent progress in engineering is in the rapid increase in the use of concrete and in the intimate association of it with steel in construction", says the *American Machinist*. "At Los Angeles, Cal., a large concrete steel chimney has recently been erected, which is 180 feet high above the base and 15 feet in diameter outside and 11 feet inside. The chimney was erected entirely by means of a scaffolding built inside as it ascended. The cement is reinforced throughout by cold twisted steel rods, both horizontal and vertical, entirely embedded in it. Other chimneys have been erected in different parts of the country, and concrete-steel bridges and buildings also are now frequently heard of."

The St. Louis Exposition is to have a unique floral clock. "This great clock will be installed on the side of the hill north of the Agricultural building. The dial will be a flower bed 120 feet in diameter. The minute hand will be 60 feet long, and the ring at the end large enough to support 12 men easily. A hundred persons might promenade on this hand without interfering with the movements of the time-piece. The minute hand will move 5 feet every minute. The clock machinery will be in an adjacent building. The flower bed will be a masterpiece of floral art. The entire dial will be a flower bed and the numerals making the various hours will be 16 feet in length, and made of bright colored leaves that grow dense and may be pruned without impairing its growth. In a broad circle around the dial will be twelve flowerbeds, one opposite each hour, each 2 feet wide and 15 feet long. The collections will represent various flowers, but each will be so selected that the blossom is open at the hour it represents and at no other. In this way both the hands of the clock and the flowers will tell the time of day. At night the whole vast timepiece will be illuminated with 2,000 incandescent lights".—*Literary Digest.*

The inhabitants of Suez have this summer been waging what appears to be a successful war against mosquitoes. They have organized a special service for this purpose. Oil is poured on the cisterns and all ditches and pools are drained of stagnant water, thus depriving the insect of a breeding place. It would relieve North Dakota of a great pest if the same thing were tried here.

It has now been proven that radium, besides having the property of maintaining a temperature three degrees higher than that of its surroundings when exposed to a very low temperature has an increased radiation of heat. Professor Aerie found that the heat emission remains unchanged through a very wide range of temperature, there being no preceptible variation from the temperature of a summer day or that of

liquid air; but if a downward stride is taken to the temperature of liquid hydrogen, the heat emission is immediately increased.

Exchanges.

So far this year we have received only a few exchanges. However, we shall send this our first issue of THE SPECTRUM for the year, to each address on our old exchange list and hope to be remembered by them in turn next month. Several June numbers of the exchanges are still on our table. It is interesting to note the programs given at commencement by the classes of the different institutions. Many classes give literary programs, and yet the "class play" is coming more and more in favor.

We wish to thank the *State Normal Magizine*, N. C., for the kind mention of THE SPECTRUM in the June issue.

Football at the University of Wisconsin is being pushed rapidly. Coach Curtis has a squad of twenty men out already and this is said to be a large number for so early in the season. Three new candidates are 200 pounds or will be when trained. Prospects look bright for a strong Badger team this year.—*Ex.*

It was a Connecticut girl, Florence Mary Fitch, who took a doctor's degree with honors at Berlin University, being the tenth woman to win such an honor in the history of the university. Three out of the nine others were Americans. —*Ex.*

Mabel McKinley Baer, niece of the late President McKinley, has offered $25,000 toward establishing a free conservatory of music in New York City, and will give her own services entirely free of charge as one of the instructors. —*Ex.*

Alumni.

E. H. Elwin, '94, is practicing law at Campbell, Minn.

James McGuigan is in the real estate business in Fargo, having formed a partnership with W. H. Best.

L. B. Greene, '01, has returned to Ann Arbor, Mich., to resume his studies in medicine.

I. D. McBain, a student in '98, was married during the summer at Bottineau. Mr. McBain is a teacher in Bottineau County, and, according to reports, is doing well.

F. O. Olson, one-half of the class of '99, was married to Miss Stella Jaberg, September 29th. Mr. Olsen will continue the elevator business at Sanborn. THE SPECTRUM extends hearty congratulations and best wishes to a former editor.

Nicholas Grest, a student in '94, for several years a successful farmer at Leonard, was elected by the board to the position made vacant by the resignation of Mr. Ash. Mr. Grest assumes charge of his work at once.

Ray M. Powell, a student in '96, now a prosperous farmer at Amenia, was a visitor at the college the last week in September. Mr. Powell was married last spring. He is interested in a stock ranch in the western part of the state.

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Editorial.

With this issue THE SPECTRUM appears for the first time under the new management. This paper, as well as the school, is beginning a new and, we hope, a most successful year. It is the intention of the new editor and staff to maintain, if possible, the high standard of excellence which has characterized THE SPECTRUM in former years. To accomplish this we ask the hearty co-operation of every student connected with the college. Do not forget, students, that your school paper, as well as every other enterprise connected with this institution, whether it be along athletic, literary or musical lines, is largely dependent on the loyal support given it by the whole student body. You can all contribute something of value to the literary, scientific, or local columns, and each contribution, even if small, will be very much appreciated.

The fall term is now well begun, but scarcely a day passes in which some new face does not make its appearance in our halls. New students, we bid you welcome and hope you will profit much by the time spent here. Strive to identify yourselves with the spirit of the institution and help make this school year the best in your career.

Many a gridiron again resounds with the cry of "Boys, get into the game"! These are not empty words. There is philosophy in them.

We see the football player on the field tackle a man "easy" and get severely hurt as the "other fellow's" foot slips through his arms, thus soundly repaying him for his half hearted effort.

We all know when gathering roses, how annoying the thorns are, but when we once enter into the task with a full determination to succeed we feel not half the pain. The bare foot boy in crossing a field of thistles did not feel them half as keenly when he ran with all his might, as when slowly picking his way.

There are times in life when we must slowly and carefully "pick our way". There are also times when we would be saved half the petty annoyances, if we could learn to meet them squarely.

How often indeed does a half-hearted effort rebound upon the actor!—in busi-

ness, in athletics, in study, in the every-day affairs of life!

Learn to "get into the game", whatever your game may be. It may be hard, but remember what President Roosevelt said, "Show me the thing that is worth doing, that is not hard to do". "What ever is worth doing is worth doing well". But you will do nothing well, unless you do enter into it with your whole soul and heart.

There is one thing which no student should overlook during his school days, whether he is an old student or is only here for the first time: we refer to the literary work. All good school courses of study recognize it as essential. It has its value to the professional man in every line of business enterprise. The college graduate will tell you invariably that he considers the work done for his literary society among the most valuable and pleasant exercises in his whole college course. Literary work develops individuality of thought and freedom of expression. This year by way of encouraging excellence, especially in oratory and debate, Supt. Stockwell offers a prize of ten dollars to the student in each of the state educational institutions, who excels in this line of school work. Students, do not neglect the opportunites you have here to improve your ability in oratory, debate, and theme writing. Join the literary societies and help make them a success.

Athletics.

The first game of the season was played with Barnesville High School, and when the final score was counted it amounted to 72 for A. C. and a large-sized bunch of invalids and goose eggs for the Barnesville outfit.

While this is not so bad for a starter, it could have been improved if it had not been for a great deal of fumbling and slow playing.

However, the boys are working hard, and it is highly probable that by the time the next game is played, these slight obstacles will be obstacles no more.

There are some hard games on the schedule and unless the improvement in team work is rapid, the issue of a few of these games will be doubtful.

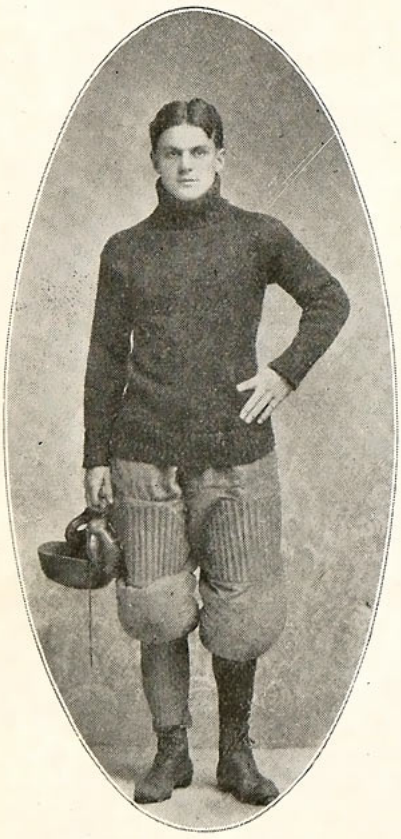
In the latter part of the first half, Captain Rose had his ankle so badly injured that he had to be taken out of the game. It will be several weeks before he can resume his old position at half-back. Porter, the fast tackle, will work behind the line until Rose is again in the game. The lineup for the game was as follows:

A. C.		Barnesville.
White	L. E.	W. Atkinson
Porter and Wauburn	L. T.	Patterson and Summerville
Schmidt	L. G.	Ischabold
Wickes	C.	Glasgow
Oswold and Swenson	R. G.	Cannon
Westergaard	R. T.	McCubrey
Birch	R. E.	Morgan
Corbett	Q. B.	Lakie
Spelliscy	R. H. B.	E. Atkinson and A. Anderson
Rose and Porter	L. H. B.	Q....Rath
McCoy	F. B.	Weyrauch

Our football team is "a sure go". There is every prospect that the team will be better than ever before. While some of the men were a little slow about coming, they were in good condition when they did come.

Coach Cochems arrived on the 23rd of September, and immediately started to work in his usual thorough and determined manner. With the exception of

a few slight changes, made on account of the new rules, he will adopt the same old, winning tactics, which brought last



CAPTAIN ROSE (LEFT HALF)

season's work to such a gloriously successful close.

Bagley, an old-time star, is back again. Although the team is a great improvement on that of former years, it is probable that Bagley's strong defensive work will win him a place.

William Wicks, one of the stars of last season, has come back to resume his studies and incidentally to occupy the same position which he so creditably filled last year.

Harry Porter, the lad who put up such a great game at tackle on last year's team, will probably play either left tackle or left half back. Spellisey, who is playing better than ever, will play the other half. Captain Rose will take his usual position at left half. McCoy, a new man, is being tried at full back.

It is still an open question as to who will play in the line, but the most promising candidates are Bagley, Schmidt, Oshwald, H. Westergaard and Swenson for guards, W. H. Westergaard, Wambem, and Smith for tackles. Birch who held the same position last year will play one end and White, a new man and a fast one, will play the other.

The second team has been organized and is playing fast ball. It can be depended upon to furnish the first team plenty of entertainment and incidently make some of the first team men "go some" to hold their places.

The schedule calls for some very good games and the students who are wise will invest in a season ticket. For those who go double, two season tickets would be a good thing.

Tommy Manns, the old "stand by", although unable to play will endeavor to stir up some enthusiasm and look after the business affairs as manager of athletics.

Summing things up, the prospects for a winning team are very good, especially if good coaching by the best of coaches and hard work by a bunch of enthusiastic athletes can make it so.

The schedule as arranged is as follows:

N. D. A. C. vs. Barnesville High School, at Fargo, October 10.

N. D. A. C. vs S. D. A. C., at Fargo, October 19.

N. D. A. C. vs. Hamline U., at Fargo, October 24.

N. D. A. C. vs. N. D. U., at Grand Forks, October 31.

N. D. A. C. vs. Minn. U. (second team), at Fargo, Nov. 6.

N. D. A. C. vs. S. D. A. C., at Brookings, November 12.

N. D. A. C. vs. Ames, at Ames, November 16.

N. D. A. C. vs. Shattuck, at Shattuck, November 21.

N. D. A. C. vs. Hamline U., at Minneapolis, November 26.

Musical Department.

Hilton Hanson of Hillsboro, the first alto of the Hillsboro Band, is a valuable acquisition to our band.

Westergaard of Valley City "helps some" with his slide trombone. He also plays an acceptable violin.

Miss Romsdahl is a new member of the chorus. She has a strong, yet sweet soprano voice, and reads quite readily.

The band is rehearsing a new set of waltzes: "My College Chum", introducing many of the familiar college songs. The boys are also at work on Dr. Putnam's A. C. Cadet March, which they hope to play at the football games.

Arthur Nickles, baritone player in the band and barritone singer in the quartet, has returned for another year's work.

The Cadet Band numbers twenty, with several more soon to return. It rehearses in two sections, in Room 2, Science Hall, Monday, Wednesday and Friday, after 4:30 P. M.

Miss Ella Beatrix Carter, our new piano teacher, is securing a large class of pupils and giving eminent satisfaction. She plays with delightful clearness. As a teacher, she is pains-taking, thorough, and every way competent. Miss Carter studied four years with Herman Zock, at Minneapolis, and two years with Elice Reimer, of New York.

Professor C. I. Nerhaugen, teacher of violin, mandolin and guitar, has returned and the work of the Mandolin Club will new be resumed. Professor Nerhaugen has studied the violin under Professor Hols, of St. Paul, a graduate of the Berlin Conservatory of Music, and Professor Shefstad, of Minneapolis, a Leipsic graduate. He studied the mandolin under America's greatest virtuoso, Siegel.

For the first time in the history of our college we have a department of music, with a graded course of music in all its branches. The students are given, free of charge, training in sight reading and chorus singing, and in the playing of band instruments. The chorus is divided into two grades, one taking up the rudiments of music and the other glee and oratorio choruses. The advanced class is at work on "The Ballad of the Rose" by Gilchrist, for early rendition. This composition for contralto solo and chorus is a most beautiful piece of descriptive writing, the poem being one of James Russell Lowell's best productions. Several of the oratorio choruses will be rehearsed for study and public rendition this term, and during the winter an opera will be staged and sung.

The general direction of the department and the vocal culture, chorus and band work, is in the hands of Dr. C. S. Putnam. Dr. Putnam studied with Geo. S. Osgood, one of Boston's best teachers of voice, and Carl Zerrahn, who was for many years director of the Handel Haydn Society of Boston. Later he studied the cornet under Fred Grant, an English band-master, who became the first trumpeter for Theodore Thomas of New York. Since coming to Fargo, Dr. Putnam has sung in the First M. E. Church choir and directed it. His work at our college last year in staging and directing the opera "Priscella", is too well known to need comment.

Local Happenings.

Miss Dagny Nelson of Fargo has registered at our college.

The Juniors are anxiously awaiting the return of Mr. Mikkelson.

Miss Kathleen Rose, '07, is engaged in teaching, near Argusville.

Mr. H. D. Porter is back and has registered for work in pharmacy.

President Worst is busy enlarging and repairing his residence for the winter.

A great number of Fargo ladies come to the college to take French and German.

The Misses Ida Smith and Minnie Jensen entered the Freshman class this year.

Mr. P.—"I just wish Mrs. Allen was'nt married, then I would take oratory".

Rufus Lee, after spending two weeks in Sanborn and vicinity hunting, returned to the college.

Mr. Scott will not attend college this year, but has taken up work in his father's office.

Miss Clara Olson's parents have moved to St. Paul, and Clara is now attending Stanley Hall.

President Worst, Professors Shepperd, Kaufman, and Waldron attended the state fair at Mandan.

Get your girl an A. C. pin. Hulberg & Mikkelson make special rates to those having half a dozen or more—girls.

Last Monday evening a large number of the students attended the reception given at the Presbyterian church to the students of the different schools of Fargo. A most enjoyable time was spent by all.

Mr. John Swenson, from Aneta, registered on Friday, and has already been at practice on the football field.

Mrs. Rose most delightfully entertained the "bachelor girls" at 6 o'clock dinner, Friday evening last.

Mr. Clifford Jaberg has decided that after all the A. C. is the best place on earth and will soon return.

Miss Mabel Leininger has decided to stay with us two years longer, in order to take her Master's Degree here.

Jas. D. Hanson, '05, has recently purchased a large mercantile business in a small town near Washburn.

John T. Weaver, who has spent his vacation in working on macaroni wheat, returned to the college October fifth.

The Sophomore class adds to its list this year, Harold W. Westergaard, a '03 graduate of the Valley City Normal.

Mr. Nicholas Grest, a former student, will succeed Mr. Ash as foreman of the college farm and will take up his duties in a day or two.

Mr. John Smith, who played right end on the football team last year and will be a strong man for the team this year, returned on the fifth.

Mr. Elmer E. May, who has always been the "day star" of the naughty fours, has accepted an excellent position as electrical engineer in Walhalla. Although the seniors greatly regret that "Sorrel Top" will not return to col-

lege, they wish him much success in his new occupation.

A. W. Schmidt, who has spent most of his vacation in the wilds of Canada, has returned to the college to resume his studies.

One of the members of the Sophomore class is carrying around a broken nose. Its too bad, Fred, but practice makes perfect.

George Axvig, commonly known as "The Famous Jud", returned to the college after spending three months on the farm near Milton.

"Cupid" has finally returned and the Sophomore girls have thrown off their grab of mourning, and are now wearing their old time happy smiles.

The Misses Stella Haggart, Dresche and Edna Baernstein, who graduated from the Fargo High School, '02, are students at our college this year.

Senior (looking down at the bottom of a class room door)—"Is this room M"?

Mr. M. H. F.—Yes, ma'am, I supposed you had been here long enough to know that.

Mr. K. (in pharmacy): Mr. E., where do we get our supply of cream of tartar?

Mr. E. (in a rush of thought): From Missouri.

Mrs. Allen has organized a very interesting class in oratory and physical culture at the college. It is to be hoped that all who can will take advantage of this opportunity.

We are sorry to note that Miss Neva Barrett, a regular student here last year, passed away at her home in Sharon during the summer vacation. Miss Barrett was a good student, took a lively interest in basket ball and was in general a great favorite with the girls, who will greatly miss her absence.

Prof. Hult has a very interesting class in senior English. At present the members are taking up short character sketches of the prominent writers of the eighteenth century.

Mr. Beaver Day, '07, one of our brighest and most enthusiastic students, is this year attending McAllister College, St. Paul. Although we regret that Beaver will not return we are glad to know that he is getting along nicely and so far greatly enjoys his work.

The classes in domestic science were filled at the opening of the term. Since then many new students have come in, and with the large increase in the number of girls this fall the authorities hardly know how to accommodate all with the limited room at their disposal.

The first enjoyable affair of the season was the reception given by the faculty to the students, at Science Hall, September 25th. This reception was probably one of the most successful ones ever held at the college. Nearly every student was present and seemed to be in for a general jollification. The members of the faculty stepped down from their "high stools" of dignity and were once more a part of the student body. After the rendition of a delightful program, delicious refreshments were served by the Freshman girls. At eleven o'clock all departed for home after having spent a most enjoyable evening.

The student body deeply regrets that Miss Mary E. McArdle was compelled to resign, on account of ill health, her position as instructor in mathematics, for this year. Mr. Alfred H. Parrott, lately of Michigan Agricultural College, has been elected to take her place. Mr. Parrott graduated from the University

of Kansas in 1899, was instructor in mathematics at the same institution, and received the M. A. degree in 1900. Since then he has been instructor in the department of mathmatics in civil engineering at the Michigan Agricultural College.

Everybody attends chapel now-a-days. There is always something entertaining as well as instructive to be heard there. Monday the students were favored by a talk from Rev. Dickinson on "The Educated Man". He pointed out in a clear and interesting way what constitutes an educated man: a noble curiosity, a fine appreciation of common things, a definite task to perform, and its relation to all other things in the world; and lastly a realization of the divinity of common things".

Professor McGuigan left Monday evening for Chicago. He was appointed to a fellowship in the Chicago University. Mr. J. H. Norton, from the department of chemistry at Washington, is filling Mr. McGuigan's place. Mr. Norton graduated from the U. of Missouri in 1899. He then taught in the Science Department in the Springfield High School, Missouri, for two years. He carried on special work in U. of Chicago and for the past two years has been engaged in the chemical section of the Department of Agriculture, in Washington.

On the 19th day of last August occurred the wedding of Professor H. W. McArdle and Miss Elita Olson. Miss Olson, who was a student of the A. C. a few years ago, is a charming young lady and a great favorite with her friends at the college. She was a genuine college girl, full of enthusiasm and loyalty for the instution. Professor McArdle first came to the college 11 years ago as assistant in the horticulture department. After a year's work, he was given the chair of mathematics and has faithfully held that position ever since. The happy couple spent the first few weeks of their honeymoon at the professor's old home in Michigan. Since their return to Fargo they have taken up housekeeping at 224 Eighth Street North. The students extend congratulations and all good wishes.

This year the college has secured the services of Mr. J. C. McDowell as assistant professor of agriculture. Mr. McDowell is a native of the State of Wisconsin and graduated from the Milwaukee Normal School in 1894. He was principal of a ward school in Merrill, Wisconsin, until 1898, when he was elected principal of the Pewaukee High School, Wisconsin, which position he held until he entered the State University in 1901. He graduated from the University in 1903 with the degree of B. S. A., and for the past six years has been one of the institute conductors in Wisconsin.

In 1896, a tall, slender young man entered the Sophomore year in our college. Had the expression of brightness not been so apparent on his countenance, the beautiful color of his hair would nevertheless have informed any stranger that in him was a student of promise. Mr. L. R. Waldron, always faithful and conscientious, received his degree of B. S. from the A. C. in '99, took his Master's degree at Ann Arbor, and returned to the college to occupy a responsible position in the biological department. But Mr. Waldron was destined to remain only a short time a bachelor among the young faculty. Fate had decreed that his merit was worthy of reward. On August 15th of this year, occurred the marriage of Miss Emma Grafenstein and Mr. L. R. Waldron, Miss Grafenstein is highly esteemed by a wide circle of friends in Fargo, and THE SPECTRUM and student body hope that good fortune may remain with the happy couple through life.