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CHEMISTRY CLUB ISSUE

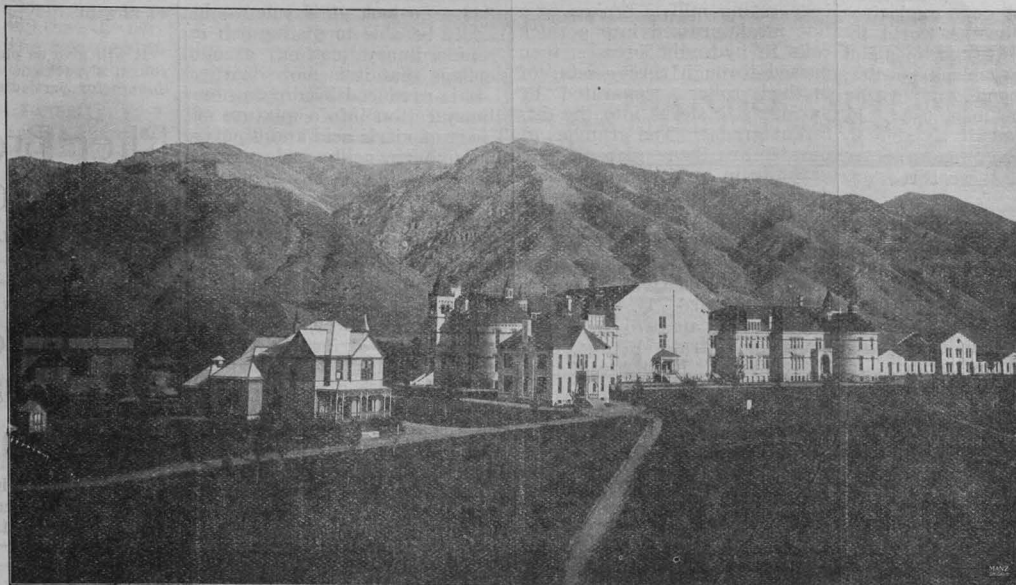
Student Life

Published Weekly by the Students of the Utah Agricultural College.

VOLUME XIII.

LOGAN, UTAH, FRIDAY, APRIL 30, 1915.

NUMBER 30.



U. A. C. BUILDINGS UP TO 1902

THE CHEMISTRY CLUB

The advanced students in Chemistry felt the need of an organization where the problems of chemistry both past and present, could be discussed. For this purpose the U. A. C. Chemistry Club was organized. The organization is made up of advanced students in chemistry and chosen ones of the faculty as honorary members. Any student who has had the required number of hours in chemistry, is eligible to membership.

There are problems of today that are of vast importance to all the chemistry people. The U. S. has been getting all of its potash from Germany. On account of the present European war she has put an embargo on this product. Where is the U. S. going to get its potash? This problem the chemist must solve. We must turn to our own resources. The radium supply of the world has been coming from Australia. There is more radium in Utah than has ever been discovered elsewhere. It only remains for the chemist to devise a means of getting the

(Continued on page six.)

THE PERIODIC SYSTEM OF THE ELEMENTS

(By John Stewart)

The human mind is continually engaged in attempts to reduce the great multiplicity of facts and phenomena which it encounters to simple terms. It sets up as a self evident axiom the idea that in all the universe there are no two things exactly alike; yet it proceeds to formulate all embracing and fundamental laws and theories. Then it proceeds to point out the defects, insufficiencies and inconsistencies of these theories and laws, many of which, unable to stand the strain fall by the wayside. Do we subject our theories to unnecessarily severe strain? Or is the attempt to trace simplicity in the complexity of nature necessarily doomed to failure? Are we warranted in casting aside the idea of a general relationship between phenomena because of the fact that the relationship may be only dimly discriminable and incapable of exact mathematical computation? If so, what is the mathematically exact definition of man?

The periodic system is due to one of the efforts to discern simplicity in the great complexity. It has been subjected to

(Continued on page five)

THE TWENTY-FIFTH ANNIVERSARY

JUNE 3-8

*"Has there any old fellow got mixed with the boys?
If there has, take him out, without making a noise.
Hang the Almanac's cheat and the Catalogue's spite!
Old time is a liar! We're twenty to-night!"*

While the A. C. is but an infant compared with Harvard about whose gray-templed alumni Holmes wrote the quoted lines, yet the spirit of play, of comradeship, of turning back the clock hands, therein contained, is descriptive of our reunions and alumni gatherings. No college man ever grows old. "Doctor" and "Judge," "Speaker" and "Mr. Mayor," "Teacher" and "Agriculturist"—all are boys when they come back to alma mater for commencement. College days really last forever; we are perpetual freshies, sophs, juniors, or seniors. "And sometimes I ask," continues Holmes, "shall we ever be men? Shall we always be youthful, and laughing, and gay. Till the last dear companion drops smiling away?" The dearest thing about a "sheep-skin" is that it

(Continued on Page Four)

MODERN HIGH EXPLOSIVES

THEIR MANUFACTURE AND USE

Lecture Delivered Before The Chemistry Club By
J. P. Benson

An explosive may be defined as a chemical compound or physical mixture, capable of very rapid decomposition or combustion, with the evolution of intense heat and a large amount of gas, upon the application of sudden shock or a small amount of heat.

As nearly all explosives, caused by chemical compounds, are rapid oxidation processes, they suddenly generate large volumes of gas, which is heated to a very high temperature at the time of its liberation.

The effectiveness of an explosive depends upon the volume of the gas liberated, and temperature attained at the moment of the explosion, the coefficient of expansion of the gas, the degree of imperviousness of the confining cavity, and the rapidity with which it explodes.

Combustion of a closely confined explosive substance pro-

duces such a great amount of heat and pressure that the entire mass is instantly decomposed with violence. In a similar way, the application of a sudden high pressure to an explosive causes instantaneous combustion. This latter form is known as *detonation*, and in practice is brought about by the explosion of a very small amount of some violent explosive, e. g., fulminate of silver or mercury.

Of the host of explosives found in use in the world today, both in industrial lines and in war, ordinary black powder, nitroglycerine and gun cotton are perhaps the most used. In this lecture I shall be able to treat briefly the manufacture and use of but these three explosives.

GUNPOWDER is a mechanical mixture composed of potassium nitrate, sulphur and carbon (charcoal). It was discovered in the fourteenth century by a German monk at Freiburg, and first used at the battle of Cracy 1346, and again at Augsburg in 1353.

Only the purest materials are used in its manufacture. The charcoal is made from well seasoned soft woods, e. g., willow, poplar, alder, which have been stored in a dry room for at least two years before being carbonized. The carbonization is carried on in large sheet iron cases which are heated to 350°—500° C in large iron retorts. After cooling and allowing of sufficient time for the absorption of oxygen to avoid spontaneous combustion, the carbonized wood, charcoal, is ground to a fine powder, and with the sulphur and potassium nitrate introduced into the mixing machine, a large gun-metal cylinder which revolves around a shaft to which numerous arms

are attached to keep the mixture constantly stored. After thorough mixing, the mixture is sifted and about 5 per cent—6 per cent, by weight, of water is added. It is then spread upon the bed of an incorporating mill where under a number of three ton rollers it is processed for from three to six hours. During this process water is constantly being added in small amounts to avoid explosions. The mass coming from the incorporating mill is broken to a fine meal, pressed into a thick cake in hydraulic presses, then passed through three sets of toothed rollers, separated by various size sieves into the different grades. The granules of powder are then glazed with graphite in revolving wooden drums. After drying and a final sifting the powder is ready for market.

Its chief uses are in sporting guns and in blasting.

The standard U. S. black powder, contains 75 per cent potassium nitrate, 15 per cent charcoal and 10 per cent sulphur.

The pressure produced by the explosion of a closely confined mass of black powder is about 44 tons or 6400 atmospheres per square inch.

NITROGLYCERINE was discovered by Nobel in 1847. He began its manufacture on a large scale in 1864, but owing to its great sensitiveness, numerous explosions occurred during the two years that followed. In 1866, however, Nobel invented dynamite by absorbing nitroglycerine in diatomaceous earth, the form in which it is most widely used today.

Nitroglycerine is produced by the action of concentrated nitric acid upon glycerine with the elimination of water which is taken up in concentrated sulphuric acid. In practice 3 parts of concentrated nitric acid and 5 parts of concentrated sulphuric acid are mixed and allowed to cool. Glycerine of sp. gr. 1.262 is then allowed to flow slowly into the mixture which is cooled, by a blast of cold air entering at the bottom of the container. The temperature must be kept at about 20° C. to avoid explosions in the factory. The nitro-glycerine formed sinks to the bottom of the vat. It is drawn off, washed several times with water and finally with dilute sodium carbonate to free it from any trace of acid. It is then ready for use.

Nitroglycerine is a pale yellow poisonous liquid with a sweetish taste. It freezes at 8° C. and thaws again at 12° C. It explodes at 180° C. which accounts for the many serious accidents resulting from trying to thaw dynamite on a hot stove or camp fire. Nitroglycerine is a much stronger explosive than black powder. It

is estimated that the temperature of the explosion is 6980° C. and that the pressure produced is 28,75 tons or 57,506 pounds per square inch.

It is used to a small extent in medicine, as a blasting agent, as one of the strong explosives in the modern torpedo and marine mines.

GUNCOTTON is cellulose hexanitrate with some of the lower nitrates of cellulose. It was discovered by Schoenbein in 1846. To look at it you would hardly be able to distinguish it from ordinary cotton, except perhaps that it is more brittle.

It is produced by dipping ordinary cotton into a mixture of 1 part of nitric acid and 3 parts of sulphuric acid and subsequent washing in water cutting and taring under water into short, loose fibers.

For military purposes the pulp is dried and pressed into various forms. The German guncotton, used in the big guns in the present war, is pressed into tape-like strips which are cut to the desired length and tied in bundles of a size to fit the breech of the guns. The American powder is pressed into sticks varying from the diameter of tooth picks and one inch long to the diameter of broom sticks and 3-5 inches long, depending upon the size of the gun for which prepared. These sticks are perforated lengthwise by small holes, the number and size varying mathematically with the size of the gun in which used, and so arranged that the powder will be completely decomposed just as the projectile thrown reaches the mouth of the gun. "This is the principle which enables a thirty thousand ton battleship to fire a broadside of sufficient force to lift itself thirty feet out of the water if the foot-pounds expended were used in that way."

A German "tape" or an American "grain", as the sticks are called, may with perfect safety be "lighted with a match and held in the hand while it sputters after the manner of a sulphur match."

Guncotton is a much stronger explosive than nitroglycerine. It is easily detonated unless it contains about 14 per cent—16 per cent water. It is in this latter form that it is used for military purposes.

About four million pounds of southern cotton goes to the manufacture of guncotton every year in the United States, to say nothing of the enormous quantities used for this purpose in foreign countries.

ENGLISH DEPARTMENT

"Mary had a Thomas cat,
It warbled like Caruso.
A neighbor swung a baseball bat—
Now Thomas doesn't do so."

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QUARTER CENTENNIAL ALUMNI COMMITTEES

The following committees have been appointed to take charge of the Alumni celebration to be held here June 7-8:

General—E. G. Peterson, '04, Robert Stewart, '02, John T. Caine III, '03, Lizzie McKay Hill, '09.

Permanent Finance—Jos. E. Shepard, '94, John H. Bankhead, '97, Violet Greenhalgh, '14, Ray B. West, '04, L. R. Humpherys, '12.

Publications—George R. Hill, Jr., '08, Ray B. West, '04, O. J. P. Widsøe, '97, Geo. B. Caine, '12, Aaron Olsen, '07.

Invitation—John T. Caine, '94, Jos. E. Shepard, '94, John L. Coburn, '04.

Music—Geo. W. Thatcher, '14, L. M. Winsor, '11, Asa Bullen, '10, Amanda Holmgren Santschi, '02, Phoebe Nebeker Peterson, '13.

Class Meetings—W. D. Beers, '99, George Stewart, '13, Edgar Brossard, '11, Byron Alder, '12, John Sharp, '14.

Antiques—2 p. m. June 7.—John T. Caine, '94, Lewis A. Merrill, '95, J. R. Thomson, '96, Anna Beers Petty, '98, Heber Carver, '08.

Old Time Pictures—8 p. m. June 7.—Wm. Peterson, '99, Harold Hagan, '14, C. W. Porter, '05, C. F. Brown, '03, Rose Homer Widsøe, '00.

Huyowat—9:30 p. m. June 7.—Wm. Peterson, '99, A. Ray Irvine, '98, Jos. E. Shepard, '94, J. Edward Taylor, '05, C. N. Jensen, '08.

Banquet and Ball—June 8.—Wm. E. Carroll, '09, Eugene Santschi, '08, Bert L. Richards, '13, Nan Nibley Bullen, '11, Claire Parrish, '11.

THE TWENTY-FIFTH ANNIVERSARY

(Continued from page one)
certifies to the fact that James Ebenezer Alexander Smith has drunk from the fountain of youth.

The twenty-fifth anniversary of the founding of the U. A. C. is to be, in addition to the regular commencement, essentially a home-coming of the "boys and the girls" to the home on the hill. The lecture, formality and stiffness of all kinds are tabooed; in their place, banquets, vaudeville (of college grade) dancing, singing of the old songs by the old and the young, pageants and pictures, and so on ad infinitum. A time of frolic, play, renewing friendships, growing unconsciously (the only kind worth while and pleasant to take,) living, real living. The whole U. A. C. population, past and present, is helping make this anniversary cake which all are to eat.

The strength and greatness of the College are revealed only at commencement when the lives

she has built are on exhibition: twenty-five years of character building, of man-culture! "Utah you have given me in twenty-five years," says the college, "so much money, so many boys and girls as raw material. This is what I have done with them. Yes, there will also be a serious, touching side to the twenty-fifth anniversary!

A tentative program follows, the parts of which will be described in detail in subsequent issues of Student Life.

PROGRAM

Friday, June 4th, 8 p. m.—College Komers.

Saturday, June 5th, 1 p. m.—Evening class and Frat. Reunions.

Sunday, June 6th, 11 a. m.—Baccalaureate Sermon; 8 p. m.—Musical Concert.

Monday, 10 a. m.—Senior Exercises; 2 p. m.—Alumni Program; 8 p. m.—Alumni Stereopticon.

Tuesday, June 8th, 11:15—Commencement Exercises; 6 p. m.—Banquet; 9 p. m.—Grand Ball.

General committee of arrangements: Prof. Ray B. West, chairman; Prof. George W. Thatcher, Prof. F. R. Arnold, Prof. N. A. Pedersen, Prof. Eugene Santschi, Jr., Prof. Rhoda B. Cook, Miss Sarah Huntsman, Miss Charlotte Kyle, Mr. A. C. Carrington, Mr. H. R. Hagan.

THE '05 REUNION

Ten years have passed since the members of the class of 1905 parted with a pledge to return to the College for a class reunion in 1915. Since then the entire Alumni Association has voted on the question of decennial class reunions and each class has given assurance of its support in the plan to meet once in ten years.

Members of the '05 class are widely scattered. It will require quite an effort and a sacrifice of time and money for the class to meet next June; but judging from the results of a preliminary canvas ninety-five percent of the members will strill into Logan on or before June 7th.

The class president, J. T. Jardine, of Washington, D. C., has asked C. W. Porter, of Berkeley to make arrangements for the meeting. A list will be published in the near future giving the names of all who will be there. Will John H. Smith kindly send his address to *Student Life* for the benefit of classmates who desire to communicate with him?

CLASS OF 1913

All members of the class of 1913 are expected at their class reunion this year. Please write your intentions.

Any person who knows the correct address (for May, 1915) of any of the following will confer a favor by sending it at once

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THE LOVELAND STUDIO

OPPOSITE THE POSTOFFICE

to George Stewart, U. A. C., Logan, Utah:

Theron W. Bennion, Asahel W. Burke, Marie Carlson (married), Charles F. Hansen, Hyrum J. Hartvigsen, Norman Jensen, John I. Lauritzen, Arnold Lowe, Robert W. McMullin, Ernest Mohr, Harry S. Reed, Samuel Van Tunks.

Dr. Thomas.—"What is the Hague Tribunal?"

Student.—"The Hague Tribunal ar—"

Dr. Thomas.—"Don't say 'the Hague Tribunal are', use 'is.'"

Student.—"The Hague Tribunal isbrates national controversy."

Small Boy.—Mamma, what is that you can hear?

Mamma.—Why my boy those are the U. A. C. chimes.

Without saying anything more the boy procured an iron spoon and tied it to the door knob so that he could make it ring by opening and closing the door. "Now, mamma," he said, "I have better chimes."

THE CAMERA CLUB HIKE

A very enjoyable canyon hike was taken by the Camera Club Sunday.

STUDENTS

We have the negatives for last year's Buzzer. Let us make some duplicate pictures for you from them.

Did you get a group photo of your fraternity?

Torgeson Studio

Meeting early with lunches and cameras, the party proceeded along unfrequented and shady paths into the canyon. Picture taking was the order of the day. Many novel snaps were taken of wood nyhms, boating scenes, delightful old ramby cabins, games, exquisite bits of spring scenery and others too numerous to mention.

A dainty lunch was served in the midst of a beautiful woodland dell, which was folloyed by a rest and pictures of camp scenes.

The hike was thoroughly enjoyed by all and the wish for another and longer one soon, was expressed by many.

A MEMBER.

Student Life

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Associate Editors
A. E. PALMER
JOHN BENSON
Locals and Socials
JOHN SHARP
Athletics
ALBERT FORDHAM

Charter Members of the Chemistry Club

Nathan Thatcher, president; A. E. Palmer, vice president; Clyde Stratford, Secretary; J. P. Benson, E. S. Smith, John Sharp, N. W. Christensen, A. T. Barrett, C. E. Cotter, Wenneth Burt, Albert Fordham, Irving Harmon, Jesse Robinson.

Volume XIII. Number 30.
Friday, April 30, 1915.

WHO IS TO BLAME

Let us call the attention of the college authorities to a nuisance found at the entrance of the College dairy. For a long time very nauseating odors have been emitting from the stale milk and wash water which fails to flow into the drain pipe as was planned at the time the pavement was laid. It appears that some attention should be given to the arrangement of the campus in the rear of the building as well as in front, because some people do enter from the rear. Proper authorities would do well to investigate.

HAVE PATIENCE

The wholesale slaughter of the Experiment Station appropriations by the Governor, has made it necessary to ask the public to be patient with the station officers in their seeming neglect of the steps of the station building. The steps are in a real dilapidated state. Time and patience, however, may efface all bad impressions and perhaps the next Governor will grant means wherewith to make the proper repairs.

TWENTY-THIRD PSALM OF THE SENIORS

*The chimes are my hoodoo.
I shall not want them more.
They maketh me to rise in rebellion, they leadeth me beside roaring waters. They restoreth my anguish and leadeth me in paths of unrighteousness for pity's sake. Yes, though I walk through the valley of sleep and rest I hear them ever, for they do follow me. Their tin and their brass they do haunt me. They prepareth a hell before me in the moment of unusual hap-*

piness, they filleth mine sleep with nightmares, my soul crieth out in anguish.

Surely goodness and mercy have forsaken me for the days of my life, and I shall dwell in the valley of misery forever.

NEW HOME FOR CHEMISTRY DEPARTMENT

The students in Chemistry, Physics and Bacteriology are rejoicing over the construction of a new building on the College campus which is to be occupied by these departments. The building will have three floors and a small basement. The first floor will be occupied by the physics department and will contain a large elementary laboratory, two advanced laboratories and a research laboratory. Besides these, there will be a storeroom, a dark room for the study of light, a locker room, two offices and large class room fitted with elevated seats for 108 persons. The second floor will have four chemical laboratories—one for general chemistry, one for organic and two for analytical chemistry, a chemical storeroom and a large class room.

The Experiment Station laboratory will be on the third floor, which will also be occupied by the Bacteriology department, having three small laboratories for this work. There will also be three private laboratories on this floor.

The equipment of the building will be ideal. All laboratories will have gas, compressed air, exhausts and distilled water, besides the regular tap water and sinks. The physical laboratory will also have direct and alternating currents of electricity. This offers excellent opportunity for work in these branches of science.

Some of the advanced students are glad they have another year in which to use the new building, and some of the seniors are sorry they graduate so soon.

The other departments are also glad to get rid of these bad smells, and leaky pipes, resulting in plaster falls.

A local physician has signified his willingness to give a yearly prize of fifty dollars for any meritorious mental contest which the U. A. C. may introduce. We now have prizes given for debating and oratorical work but nothing for written work. We suggest that the prize be given for the best original thesis written by any undergraduate. This would stimulate the students to greater effort in their thesis writing and make them more careful of their English and subject matter. The executive committee of the student body should investigate the offer of our friend and see that some activity is in-

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stituted to bring the prize into the school. We need just such things as this.

PERIWIGS ELECT OFFICERS

Last Sunday afternoon the Periwig club met at the Delta Nu fraternity house and elected their officers for next year. Lowry Nelson was re-elected president, with Louise Ogden as vice president. De Lore Nichols manager; Ruby Wolf secretary; Nathan Thatcher publicity man and Miss Huntsman, Prof. Pedersen, Lowry Nelson, Morrell Powell and Leora Thatcher as membership committee.

The future of the club looks good. The new corps of officers will outline the program as far as possible this spring for next year. An excellent program will be prepared. Watch the Periwigs. Its a live bunch.

ENTOMOLOGY

Dr. Titus.—"What a wonderful creature the grasshopper is; he can jump a hundred times its length."

Davidson.—"That's nothing. I once saw a bee raise a two hundred pound man three feet in the air."

Listen Students Klassy Kollege Klothes

We are making our way by selling you the best TAILOR-MADE CLOTHES at ready made prices. Have some individuality about you and look like a man. Give us a chance.

STIEFEL HARRISON

St. John's Club, Logan.

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LOGAN, UTAH.

THE PERIODIC SYSTEM OF THE ELEMENTS

(Continued from page one)

great strain, a strain which has almost broken it down; but it still survives, although it is now recognized that the properties of the elements are not periodic functions of the atomic weights alone as they were formerly supposed to be. It was recognized by the founders of the system. Newlands, Mendeleeff, and Meyer in 1864 and 1869 that the periodic nature of the relationship was not so plainly discernible as to be capable of being reduced to mathematical terms.

Our seasons, spring, summer, autumn, and winter are periodic functions of time, or of the earth's revolution around the sun. This is one of the functions which are capable of exact mathematical computation. Spring follows spring at equal intervals of time, on the average, century after century. Yet we sometimes have an early spring, or a long winter, and it is impossible to tell just when the coldest weather will occur next winter, or the warmest weather next summer. Yet no one denies, because of these individual strayings from mathematical grace, that spring and winter are periodic. The difficulty of reducing natural phenomena (the periodic system included) to exact mathematical formulae lies in the fact that no one cause is operating alone to produce the effects we see. Even the simplest effects are apparently complex and the result of complex causes. Besides, the infinitely small is beyond our powers of measurement on the one hand like the infinitely large is on the other. We can measure best, and apparently understand best, those things which are of approximately our own size. We have no difficulty in seeing and understanding the spaces between the trees of a forest, but we can not see the spaces between the molecules of water. We are approximately of the same size as the trees of the forest. If we were of molecular size and endowed with the sense of vision, the spaces between the molecules would probably be plainly apparent.

Besides the difficulty of reducing the periodic system as a whole to mathematical simplicity, the system has received some severe jolts of a more specific nature, jolts which have left deep scars. The foundation of the system was first severely shaken by tellurium and iodine, by osmium, iridium, and platinum, by nickel and cobalt, and by argon and potassium. Diligent investigation of the atomic weights has served to smooth out some of these difficulties, especially the one created by osmium, iridium and platinum; but that created by tellurium and iodine and argon and potassium has refused to yield to long

and careful investigation of the atomic weights. If the atomic weights is the only factor which determines the position of an element in the system, then argon and potassium should change places, so also should tellurium and iodine. But the chemical properties of these elements will not allow such a change to be made, so with respect to them the fundamental basis of the system fails completely. But these individual discrepancies are not sufficient to cause us to abandon the system as a whole. Any more than an early spring would make us abandon the idea that spring is a periodic function of time. There is always the possibility of unknown factors at work which modify the effects of the one cause we are investigating. Notwithstanding the extremely careful investigation of the atomic weights of tellurium and iodine, the possibility of error from unknown causes, possibly closely similar elements, is not excluded, but only rendered increasingly improbable.

The idea that mass alone does not determine chemical properties is thus forced upon us. But matter at rest can be found nowhere in the universe. It might be presumed that chemical effects which we see are a result of this state of motion as well as of the mass. That is, energy is involved in chemical phenomena as well as mass. So some of the leading chemists at the present time consider the electrical content (or state) of the elements as being a determining factor in the manifestations of its properties. Thus, they say electrical content, or valence, determines the position of an element horizontally in the system and mass determines its position vertically. Ferrous iron and ferric iron have the same atomic weight but different valences; i. e. different electrical content, and are almost as different as two elements. They would therefore occupy two different positions horizontally in the table. Likewise monovalent copper and divalent copper, monovalent gold and trivalent gold, etc. The writer suggests that the properties of elements do not depend on themselves alone, but that their environment is fully as important if not a more important factor. What properties would one atom existing alone in the universe exhibit?

Another strain for the periodic system came in 1895 to 1900 as a result of the discovery of argon, helium, iron, krypton and xenon. These elements exhibit no valence and no chemical action. There was no place for them in the table, and if they had never been discovered the periodic system would never have suggested to anyone that they be looked for. They were soon accommodated in the table by placing them all in a new column, on

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TRIED IN THE FURNACE OF competition and subjected to the test of years of practical use on nearly 2,000,000 farms the world over, the De Laval has proved its overwhelming superiority to all other cream separators.

TWENTY YEARS AGO THERE were as many makes of factory as of farm separators, but for the past ten years the De Laval has had this field almost to itself, 98 per cent of the cream separators in use by creamerymen and market milk dealers today being of the De Laval make.

IT HAS TAKEN THE INEXPERIENCED farmer a little longer to sort the true from the untrue, the wheat from the chaff, in the maze of conflicting catalog and local dealer separator claims, but year by year the ever-increasing proportion of farm separator buyers is reaching the same conclusion as the creameryman—that the De Laval is the only cream separator they can afford to buy or use.

MANY OTHER CREAM SEPARATORS have come into the lime-

light of publicity for a few short months or a few short years, claiming to be "as good as" or "cheaper" than the De Laval, but their users have sooner or later found them lacking in some one respect or another, and even where a few have seemingly done well their users have come to learn that the De Laval was a still better machine.

THE UNFIT OR THE LESS FIT cannot possibly survive for long in separators or anything else. Think of all the separators you used to see advertised so extravagantly in your favorite farm papers. Where are they now? Why do you seldom, if at all, see their names mentioned? Simply because the fittest must survive and the others must fall out of the race.

THE DE LAVAL HAS TRIUMPHED over all other separators, and its supremacy is now almost as firmly established in farm as in factory separators because its separating system, design and construction are essentially different from and superior to other separators.

The DE LAVAL SEPARATOR COMPANY

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the theory that it is appropriate that there be a gradual transition from strongly electro negative elements like fluorine to strongly electro-positive ones like sodium rather than an abrupt transition. Most chemists accept this disposition of them without much complaint, but nevertheless they still form something of a stumbling block.

Again a number of rare elements, some sixteen or more, apparently all closely related and resembling aluminum and other of the "earthly elements", can not as yet be accommodated in the table. In connection with

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these, it has been suggested that more than one element may occupy the same place in the table. Also the suggestion has been made that these rare elements be all placed in the same column in the table, but that among

themselves they form a miniature periodic system within the regular system. They are still awaiting a more acceptable disposition.

Some thirty-seven radioactive elements discovered in recent years also form a sore spot on the system. Many of these have different atomic weights but can not be distinguished from one another chemically. Such are called isotopes. Considering each set of isotopes as only one chemical element, the difficulty of disposing of the thirty seven is reduced so that places for only ten are required at present. But so far the ten have not been accommodated.

Aside from all reference to the periodic system, the last paragraph contains an interesting fact; viz, certain substances of different atomic weights are indistinguishable chemically. This means that the atoms of chemical elements are not of constant mass. This fact was pointed out by Sir Wm. Crookes some thirty five years ago, long before the discovery of radio activity, but was entirely unheeded by the scientific world at the time, as pioneer work generally is. The fact was re-discovered by Soddy a few years ago. This fact suggests that the phenomena which we recognize as chemical, takes place only between masses of matter of approximately the same size. So in the periodic system we find it increasingly difficult to trace periodicity among the elements of high atomic weight. Here a slight change of mass, being insignificant in relation to the total mass, produces no detectable chemical phenomena. So, also, in the paraffin series of hydrocarbons the addition or subtraction of CH₂ makes a very noticeable change in properties of the hydrocarbons of low molecular weight, but as the molecular weight increases the addition or subtraction of CH₂ produces only a diminishingly visible effect, and this effect gradually becomes undetectable. The limits of the series are thus probably determined by our inability to detect differences rather than by any natural limits which the series may have. We are the spectators of a similar phenomenon on a large scale. The earth is continually sweeping up meteors in its path and as a result of this it must be

growing larger, but the addition of a few meteors to the earth does not make a visibly new earth of this globe of ours. But if the earth were to sweep up another mass of matter of approximately its own size, we undoubtedly would have some radical changes taking place. Would this be a large scale example of a chemical phenomenon?

Imperfect though the periodic system may be, there can be no doubt but that a fundamental law is there shown in operation, which we can only dimly trace because its effects are obscured by the operation of other laws. But if this were the only example in nature of periodic functions, its defects would probably cause its abandonment. But periodicity is very conspicuous in some phenomena and distinctly traceable in others. The movements of the planets and their satellites from a great distance the planets would appear to swing back and forth like a pendulum, with the sun near the center of the swing. So, also, in human history periodicity is distinctly traceable. For some fifteen hundred years or more prior to the 5th century A. D. there was a period of intellectual activity which was followed by a thousand year period of comparative intellectual stagnation. This has been followed by another period of mental activity and increase in knowledge which is continuing at the present time. Will this be followed by another period of mental lethargy?

THE CHEMISTRY CLUB

(Continued from page one)

element from its ores. These are just two instances of modern importance. Besides this, there is a lot of research work being done along the lines of physical chemistry—theory of solutions, etc., which can be reviewed profitably in a club composed of students in chemistry. The club also aims to visit all of the manufacturing plants that are available and of interest to its members.

Then aside from this, those organizing the club had another purpose in view, though it is not stated in the constitution, that is the handling and presenting of a difficult subject before a class. Some of our members have already had teraining in Miss Huntsman's public speaking class. There is something more than the ordinary public speech, however, in that the explanation of this kind are mathematical and must be exact. Many of these students are planning to teach chemistry in the high schools of the state, and elsewhere. For a man to be successful as a teacher, he must be able to impart his knowledge to his pupils. There are many who fail as teachers because of not being able to do this. Of course, public speaking is an



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THE HUB

COME AND BE CONVINCED

art, founded on the science of psychology, and so is teaching, but practice is a requisite. In order to get this practice the students will give all the lectures and conduct the work of the club. Its members will thereby, gain knowledge and experience in imparting this knowledge to others. The faculty members present will assist in the discussions.

We hope that this organization will be permanent and grow in to the livest and most successful organization of its kind in the institution.

DOMESTIC SCIENCE

A little boy stopped to watch the girls at work. Finally he asked, "What kind of pie are you making?" "Lemon Meringue Pie," answered Mrs. King. The boy disappeared but returned presently with the query, "What did you say the pie's middle name was?"—(from D.)

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Chem. I.—The difference in chemical and physical change is that a chemical change is permanent and a physical change is temporary. For instance, if a fellow gets his eye blacked in a football game it is a physical change; if he gets killed it's a chemical change.

Physiological Chem.—"Digestion begins in the mouth and ends in the big and little testament."



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Locals.



Ward McAlister was a sorosis visitor Sunday.

Who is librarian for the Ag. club?—the table.

We expect no embarrassing moments at the Kollege Komers.

Dr. West makes his physical chemistry so interesting that a half grown dog has joined the class.

The entire battalion spent Monday, Tuesday and Wednesday in getting some experience in army maneuvering.

Sorosis were entertained by the Thetas at Murdock's last Wednesday evening. Margaret Wilkinson read Barry's "Rosalind", after which dancing was enjoyed and refreshments served.

We are delighted to see the good attendance of students at chapel lately. Where are the faculty? Don't they have to go? Let's hold student body meetings. They are more interesting.

Last Saturday evening the Theta girls participated in a slumber party. From reports of the near neighbors, it seems that they were as slumberless as a mixture of hydrogen and chlorine in the light. In their slumber the "High Cost of Living" was mentioned. The girls were dangerously sleepy the next day.

A Benedict and his little boy passed the old man who sits on the corner turning his hand-organ. "Daddy, what's the matter with that man?" asked the child. "He's blind," the wise father replied. The organ stopped and the player put in another roll. The little fellow noticed that it had stopped and when it started again, said, "Daddy, that man's blind again."

The band was appreciated at the track meet Saturday.

Miss Gladys Smith has returned from a visit to Provo.

Miss Mary Clark, of Brigham was a guest at the Theta house Saturday and Sunday.

Tuesday evening Miss Glenna Ballantyne entertained the Thetas at her home. A very pleasant evening was spent.

It has been rumored and practically admitted by himself, that "Snip" Knudsen is the latest addition to the Benedicts.

The Sorosis will conduct a cake sale at Howell-Cardon's, Saturday, beginning at eleven o'clock. Come early to avoid the rush.

Saturday night the Misses Alta Owen, Leora Thatcher, Jessie Spafford, Edna Hansen, Ione Feldstead, Lora Bennion and Karma Parkinson became full fledged members of the Sigma Theta Phi sorority.

Found on Dr. Hill's desk—
*Here's to the girl with ruby lips,
And may she hold full sway
Her lips may be red and hard
to beat
But I'll put mine against them
any day.*

From Chem. I Papers—An acid is an alkali and turns red litmus blue. Hydrogen is a gas that, when it goes through a tube, it whistles. When you treat sodium with water—mercury is formed.

Information wanted—Two disguised ladies sitting in the bottom of a gravel wagon were the cause of some comment as they paraded the streets last Saturday. As they passed the German meeting house, they were seen pouting and conversing interestingly. The people nearby decided that they must be foreigners.

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In the Seventh ward chapel Sunday night there wasn't even room for an argument.

Did you ever know—That an assay ton contains the same number of milligrams as an avoirdupois ton contains troy ounces?

Will G. Farrell, of the Beneficial Life Insurance company, of Salt Lake, will give a lecture to the Commercial club in room 302 at 2:20 this afternoon. All are invited to attend.

Student.—"Professor, what would I get if I poured hydrochloric acid on potassium cyanide?"

Professor.—"A lot of flowers and a free ride."

Ethel, looking at her new brother.—"Papa, did the doctor bring little brother?"

Papa.—"Yes, dearie."

Ethel, reflectively.—"Well, daddy, would you mind trying another doctor."

George Cahoon returned to his home in Murray Tuesday.

A bunch of keys have been found. Owner call at Registrar's office.

Prof. Peterson.—What is characteristic of an arid country?

Burt.—An arid country is one where perspiration exceeds precipitation.

Overheard at the 7th ward, Sunday night.

He, (looking for a seat).—"Shall we squeeze in here?"

She.—"Oh, I'd rather wait until we get home."

The Student Body certainly enjoyed the tug of war Saturday between the Ag. Club and the Faculty. The former's strength was very noticeable, but the strength of the faculty was microscopic; in fact, they did not even make their appearance on the field.

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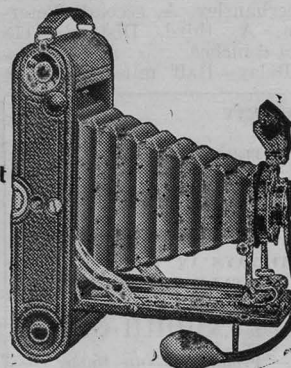
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ATHLETICS.

TRACK

B. Y. C. athletes no match for Aggies.

Before a good sized crowd of students and townspeople, the A. C. beat the B. Y. C. with the wide margin of 19½ to 28½ points. The B. Y. C. team was composed of a few individual stars. On the other hand, the A. C. athletes have the possibilities of rounding into a well balanced team. No records were broken, but good time was made in several events. Petersen, Snow and Anderson were the big point winners for the A. C., while Sheffield and Price were the big point winners for the B. Y. C. Price won the quarter mile easy, and he has a good chance of placing in the State meet. Following are the results:

100-yard dash—Peterson, A. first; Sheffield, Y. second; Voorhees, A. third. Time—10:2.

220-yard dash—Peterson, A. first; Kapple, A. second; Sheffield, Y. third. Time—22 flat.

440-yard run—Price, Y. first; Beckman, A. second; Van Leuven, A. third. Time—54.

880-yard run—Anderson, A. first; Price, Y. second; Fordham, A. third. Time—2:7.

Mile run—Anderson, A. first; Hillam, A. second; Davis, Y. third. Time—4:48.3.

Low hurdles—Voorhies, A. first; Geddes, Y. second; S. Peterson, Y. third. Time—28:1.

High hurdles—Brossard, A. first; Owens, Y. second. No other entry. Time—18:2.

Pole vault—Madsen, A. first; Dorton, A. second; Hess, Y. third. Height—10 feet 6 inches.

High jump—Oberhansley, A. first; Wright, Y. second; Peterson, Y. third. Height—5 feet 6 inches.

Broad jump—Sheffield, Y. first; Kapple, A. second; Aldous, A. third. Distance—20 feet 7 inches.

Shot put—Snow, A. first; Twitchell, A. second; Luke, A. third. Distance—39 feet 5 inches.

Hammer throw—Snow, A. first; Jarvis, A. second; Wilson, A. third. Distance—137 feet 7 inches.

Discus throw—Snow, A. first; Oberhansley, A. second; Peterson, A. third. Distance—113 feet 6 inches.

Relay—Half mile. Won by

Aggies in 1:37. Van Leuver, Kapple, Voorhies and Hugh Peterson ran for the A. C.

* * *
BASEBALL

Monday afternoon, the A. C. baseball boys went down to the B. Y. C. to teach the B. Y. C. lads how to play the "national" game. The B. Y. C. team, which is composed principally of high school players, put up a plucky little fight. But of course the A won—9-5. At times the game was spirited, much enthusiasm being manifested at all times. Our team played the most ragged kind of game. All the members of the team were not there; some didn't even know the game was to be played. Hence the poor plays. What our players need is the students to back them, to make them hit, run, slide, dive, push, hurry!

* * *
TENNIS

Nelson won the Titus medal and championship in the singles. Odell and Carrington won the championship in the doubles. These men will represent the College in tennis this year.

The B. Y. U. tennis team will play us on our own courts next Monday. Come on students, and see our men in action! Show some spirit. Help from the grandstands is about half in winning the contests. See the fascinating game.

* * *
The A. C. track team goes to Provo to compete with the B. Y. U. athletes, Saturday, May 1.

THE RELATIONSHIP OF
CHEMISTRY TO INDUSTRY

Chemistry is intimately connected with all phases of industry. Agriculture, mining, commerce and home economics rest firmly upon the foundation stone chemistry. In the beginning all industry rested only on an empirical basis. But with the birth and development of modern chemistry industry was placed upon a truly scientific basis.

Fifty years ago Baron Von Liebig said "Agriculture is of all industrial pursuits, the richest in facts, and the poorest in their comprehension. Facts are like grains of sand which are moved by the wind, but principles are these same grains cemented into rocks. Since that time the applications of chemistry to agriculture has been the cement which has cemented these facts into the principals of modern agriculture as we now know it. The agronomist is dependent upon chemistry for accurate knowledge of his crops and soils. The modern conception of the plant foods and the proper nutrition of plans have been developed by the applications of chemistry.

The animal husbandman is dependent upon chemistry for the knowledge of the composition of his feeds and their proper pro-

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portion. It must also be remembered that it was a chemist who devised the Babcock test. The true value of the milk produced is demonstrated by the applications of chemistry. The entomologist must turn to chemistry for information regarding his sprays, insecticides and poisons. Without the application of modern chemistry the entomologist would never have been heard from but would have been consumed by his own insects. The poultry man is dependent upon chemistry for concrete information regarding his feed, the proper method of mixing. Modern artificial incubator has been developed by application of chemistry. The veterinary surgeon likewise calls upon the chemist for help and receives it in the form of antiseptic agents.

As it is with agriculture so it is with other forms of industry. Mining is dependent upon chemistry for the methods of extractions of gold, silver, copper and other valuable metals. The econ-

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omic world today is stirred as never before to devise methods of securing dyes which are produced entirely in the chemical laboratories, modern wars are dependent upon the chemist for the modern explosives, dynamite, and gun cotton, modern transportation would be impossible without the steel rail which in turn could not be produced without the applications of chemistry. Chemistry thus affects us in all of our relations with the common affairs of life.

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