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Irrigation in the Arid Region.

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The rapid development of the agriculture of the West since 1875, while affording the greatest opportunity ever known for commercial advancement, has in its immediate results had a depressing effect on the business of farming in the Eastern States, so far as the production of the staple crops, corn, wheat, beef and pork, are concerned. This immense area of free land, rich virgin soil, with cheap transportation to the East, has made its influence felt.

The change from grazing lands to a farming country has been so rapid, and the quantity of crops produced so great that it has been difficult for the eastern farmer to adapt himself to the new condition of things.

The cheering thought that has helped to carry the eastern farmer through this time of depression is the belief that the farming lands of the West would soon be occupied, and that the increased population and increased exportation would in time bring about the former condition of things, and prices of farm products would reach their former level.

It was believed, in fact known, that nearly all of the country west of the 100th meridian and south of the 40th degree of latitude, a section equal in area to one-fourth of the entire United States, was either mountainous, rough, broken country, or sandy, barren plains, where nothing could ever be expected but scant grazing, and where even stock-growing would be subject to serious losses.

The investigation of the "grid belt" by the Senate Committee, and the report made, has called attention to the possibility of still further developing the agricultural production of the country by the use of water in irrigation, but to the present time people who do not live in or have an interest in the "arid belt" have looked on the investigation unfavorably, and objected to the expenditure of the public money in surveys, or in proposed construction of reservoirs and canals, more from believing that it is a foolish extravagance, than that there is a possibility of building up certain lines of agricultural industry in this immense arid region with which no other region of the country can successfully compete.

All intelligent people have heard something of the growth of crops by irrigation, where there is little or no rain, in Egypt, India and several other countries, and of the production of fruits and vegetables of enormous size in California, but that a country without rain could become a great agricultural country has not even been thought worthy of consideration.

Before coming into contact with the artificial (?) method of supplying water to growing crops, the writer held the belief that irrigation was perhaps a good thing for those unfortunate people who could not secure land where bountiful nature had made provision for vegetation, but after seeing what has been done, and studying the possibilities of scientific control and use of water, I am forced to the conclusion that a really scientific method of farming is only possible where water is under control, when the farmer can feed and water his growing plants as he may feed and water his growing animals. Instead of suffering alternately from floods and droughts, he applies the water when the crops should have it, and only then.

Farming on irrigated, arid land means

placing farming, as a business, on the basis of manufacturing. It is not subjecting the work of the season to the chance of having rain at the particular time that means a difference of from 25 per cent to 90 per cent of the yield; for with his hand on the headgate of his canal, the farmer may control the growth of his crops almost to the extent that the engineer, with his hand on the throttle valve of his engine, regulates the movement of the machinery in a factory.

The arid belt is subject to changes of temperature; crops may be influenced by frosts, broken down by winds, but these are universal drawbacks and of minor importance. Rainfall, too much or too little, or not at the right time, is the one thing that causes more anxiety and greater losses the country over than anything else.

The arid belt extends from Mexico to Montana and to the Coast Range on the west. The tillable land has an elevation of from fifty feet to six thousand feet, and a climate varying from semi-tropical to cool temperate. In this great area climate may be found adapted to the growth of nearly all agricultural products known. Along its southern border the orange, lemon, date and other semi-tropical fruits are produced in perfection as to quality and quantity, while in the central and northern portion and on any of the higher elevations, all the fruits, vegetables, grains and grasses of a temperate climate, yield in quantity and quality far beyond what may be reached in other portions of the country. The cotton and sugar cane fields in the southern portions rival those of Mississppi and Louisiana, and surpass them in yield.

Another feature of this region is its healthfulness. The dry, clear atmosphere, and the bright, sunny days are not conducive to lung diseases or to rheumatism, and with slight attention to well-known sanitary laws most diseases common to humanity may be avoided.

It may be thought that the cost of procuring water and applying it to growing crops would prohibit its general use. That this is not the case is shown by the following figures taken from the special report of U. S. Engineer F. H. Newell for the census. Referring to Arizona he gives the average cost of water right per acre on all irrigated lands in Arizona as $7.07; the cost of clearing and fitting the land for cultivation, $8.60, which added to the purchase price paid the government, $1.25, makes the total cost of one acre of land ready for cultivation, with water, $16.92.

The annual rental for water averages $1.55 per acre. This sum is paid to the canal companies to keep up the canals, and in private companies it is paid in assessments, either in labor or in money to keep the canal in repair.

The above refers to land on which grain and alfalfa are the principal crops. On fruit farms the cost of leveling the land so that water may be applied economically and with least trouble is greater, varying from $5 on level land, to $50 per acre when there is considerable grading to be done.

The cost of watering the crop varies with the condition of the land; the more nearly perfect the grade of the land, the less the labor of applying the water.

On fruit farms where the land is fairly well graded before planting, with a good system of ditches, and irrigation boxes with stop gates, one man will take care of 40 acres. On grain and alfalfa land he will take care of 75 or even 100 acres with a good head of water.

On the experimental farm belonging to the station, one quite uneven piece of land cost $50 to bring to uniform grade, another tract less than $5 per acre.

The cultivation required on irrigated land is somewhat more than is thought necessary in average farming, but no more than is found profitable in good farming in any part of the country.

To keep young fruit trees in rapid grow-

ing condition, we have, during the present summer, irrigated once a month, and after each irrigation the ground is cultivated thoroughly, cross-harrowed and made fine on top. Having no rain-fall, the soil remains loose on the surface, and where weeds do not spring up no further cultivation is required until the next irrigation.

Since beginning our work on the station farms last December, our men and teams have in all lost three days' time from bad weather. We have had occasional rains during the winter, usually showers that caused no delay, only one all-day rain.

This is due to the fact, that the rain-clouds nearly all pass over the valleys and level mesa lands, and the precipitation takes place as the clouds rise into the cooler atmosphere over the hills.

I do not care to refer to the growth of trees or yield of crops in this "desert" country; the actual facts, if stated to me before I came here, would not have been believed.

A relative idea of what is done may be formed by supposing that a tract of land in Southern Michigan or in Illinois could be surrounded above and below with an almost constant summer temperature, nine months in the year, and a good spring temperature, such as the best April weather, the remainder of the year, and that a gentle rain could be provided when needed. If one can suppose such a case, and the growth under such conditions, he may form some idea of growth in the "great desert" of Arizona under the improvements rapidly taking place.

But a few years ago fruits and vegetables of any kind cost from ten to fifty cents per pound in California; they had to be hauled overland from the East.

A small portion of California has been reclaimed by irrigation, and the result is shown, not in a home supply, but train-load after train-load, thousands of tons of green and dried fruits forwarded to all the large cities.

The people of Arizona, New Mexico and Southern Texas are learning that they can grow fruits and vegetables on the "desert."

The entire arid region seems to possess the necessary soil and climate to produce certain products in certain places in greater perfection than they can be grown outside of the arid region.

The problem is new; it is largely a question of engineering, in the handling of great quantities of water in the most economical way.

Recent investigation indicates that the greater part of all the valleys and plains of the arid belt may be brought under cultivation. It is a question of supplying water and it will require a large outlay of capital, but it is practicable and it is found profitable.

The work has gone far enough to show that the construction of dams, reservoirs and canals under corporate organization offers as good security and equal returns with the best investments in the country. The result is shown in the fact that irrigation work is attracting the best engineering skill of the country, and construction work now being inaugurated is planned with reference to permanency, no matter what the cost.

Why should the arid regions not fill up rapidly with industrious well-to-do people, when its farmers and fruit growers may practically control the one thing that above all others determines the yield of their fields —water for growing crops?

Mind Reading as an Art.

V. L. STEWARD.

Mind reading is popularly understood to be the art of divining the thoughts of another through some unknown agency. This idea we believe to be a false one. The explanation of this art we believe may be brought within the range of a science understood by us all. True it is that there are those who

seem to be able to follow us in our thoughts to a certain extent, but a little careful consideration and a few experiments will suffice to show that this is accomplished by means of close observation of the action and features of the subject operated upon. Thus, the mind-reader really reads *expressions*, and interprets thoughts from them.

There are those, also, who, by means of physical connection, seem to be able to form mental relationship, and to thereby divine certain conceptions held fixedly in the mind of the subject. It is of this latter kind of mind-reading that we intend to write.

In this method of mind-reading the operator is usually blindfolded, and holds in physical connection with himself a second person (the "subject" as we have called him), who concentrates his mind upon some object to be found by the operator. This method of mind-reading has been practiced for fifteen or twenty years, with a greater or less degree of success. A number of men have become famous through the success of their public exhibitions, and many ladies have practiced it in private entertainments.

The methods of securing physical connection are quite numerous, but the following are most used:

1. The back of the subject's hand is pressed firmly against the forehead of the operator, who, with his other hand, touches lightly the fingers of the subject's hand.

2. The operator holds loosely in his hand the wrist of the subject.

3. One finger of the operator is applied to one finger of the subject, the papillæ of one touching the papillæ of the other.

4. The hand of the subject rests lightly upon the shoulder of the operator.

By these various methods some astonishing feats have been performed, such as the finding of small objects upon which the subject's mind had been concentrated. For example, the operator may be shut up in another room, out of hearing, while some person suggests that as a test the operator be required to take a hat from a stand an it upon a certain figure in the carpet. it may be required that he go to a part of the room and take a handk from the hand of a certain lady, retur it, and place it in the hat. Perhaps h quired to do a dozen other things, an be blindfolded while he does them these arrangements the operator nothing, but the subject must keep hi rigidly fixed upon the things to be The operator is now brought back i room, and if he be skillful, and the be a good one, the arrangements mac be carried out to the very letter, and v the slightest hesitation. In the san many other feats are performed, wh the casual observer, seem marvelous.

However, there are certain exper which may be tried that will make the thing plain. Let the object to be fo something upon the person of either th ject or the operator himself, and he unable to find it. Or, let the subject he keeps his mind fixed upon the ob be found, draw the operator slightly another part of the room. He will ceived and go where he is led. Fr we get the impression that it is a l and not an object, that the operator s for. This idea is further sustained by a few other things.

The mind-reader cannot describe t ject which he finds any further than enabled to do so by the sense of touc cannot tell whether the piece of pa finds is plain or has a picture upon it. only impression he gains from his su that of locality. The best results tained by operating upon those subjec are of a nervous temperament, and will power. A subject who has a mind and sufficient will-power to con muscular movement will be enabled t the best mind-reader; or speaking ac actly, as we believe, mind-reader. truth of the matter is, that it is by m

musculartension and relaxation on the part of the subject that the operator is enabled to determine the *locality* of the object upon which the subject concentrates his mind. If the object to be found is upon the person of the operator or that of the subject himself, he cannot, either consciously or unconsciously, lead the operator to it, and consequently the operator does not find it. Or if the subject has sufficient will power to control all muscular action that can aid the muscle-reader, he again loses his guide, and the search is unsuccessful.

It is a well established physiological fact that the muscles do act, to a greater or less extent, in accordance with the action of the mind, and without, or in direct opposition to, the action of will. It is from this fact that we get our explanation.

The mind of the subject, rigidly fixed upon the object to be found, produces unconscious muscular tension in that direction, of which the skilled muscle-reader takes advantage and follows in the direction toward which it tends. When he arrives at the spot where the object is located the unconscious muscular relaxation of his subject notifies him of the fact, and he begins to feel around for something to pick up. Perhaps he picks up a number of things in succession, until finally he gets the right one. He is then greeted by shouts of applause from the audience, and his task is completed.

In this way any one might, with a little practice, become a "mind-reader." Not all can become experts, of course, for it requires an especially delicate sense of feeling to detect readily the muscular tension in ordinary subjects; but any one can practice it with the assurance of at least a limited amount of success.

On the evening of July 9 the Chemical and Physical Departments gave a reception to the members of the State Board, faculty and students. The whole laboratory was thrown open, and much of the apparatus so arranged as to be as clearly understood as possible. Refreshments were served by candle-light on the lawn east of the laboratory.

Tucson.

J. W. TOUMEY.

Tucson, probably more than any other city of equal population in the United States, is Mexican in its character and surroundings. To one accustomed to the ways and energy of the East and North, Tucson is indeed a peculiar city. More than one-half of the people are Mexicans, while in the close vicinity are the remnants of several Indian tribes. Passing along the narrow streets one will hear the Mexican language as frequently as the English, indeed there are a large percentage of the inhabitants who know nothing of the language of this country. Tucson is in reality an adobe city. Even many of the most extensive business places, including banks and hotels, are erected from these large sun-dried bricks. The walls of the buildings are two or three feet in thickness. The roofs are flat and frequently made from the same material. The adobe bricks are so soft that they are easily crumbled by the hand, but the rains are so infrequent and the walls so thick that they will stand for years. The adobe houses of the poorer class of Mexicans are without floors, and remind one much of large hollow cubes or rectangles, with now and then a hole for a door or window. These thick, heavy walls are a great protection against the intense heat of this climate at this season of the year. The variation of temperature between night and day is from twenty to forty degrees. The adobe building has not this variation, but the temperature is about the same both day and night. At this season of the year, two hours after a heavy shower one would not surmise that the broad *mesa* had felt the reviving influence of a drop of rain for months, save for the imprints left by the large drops as they sink into the loose earth. A foot or two from the surface the soil, at all seasons of the year, is as dry as powder, and probably has been so for ages. The air is so dry and the evaporation so rapid that water

placed out in the open air in a porous vessel cools rapidly. Water direct from the well is very warm, and is generally cooled in this manner before being fit to drink.

Many of the more modern buildings are of brick or wood, and are built with broad verandas, which are a great protection from the burning sun.

Although the days are hot,—warm will not express it,—the nights are cool, beautiful and refreshing. The people, as a rule, sleep on cots out in the open air, where they are seldom disturbed by rains or dews. Not even a mosquito, save in the irrigated districts, to disturb one's repose.

Even the days, with the thermometer from ninety-five to one hundred and ten degrees in the shadiest corner of the house, are not so oppressive as one would think. A sunstroke is unheard of in the territory. The atmosphere is so dry that the perspiration evaporates, with its cooling effect, as rapidly as it is formed. I have taken a tramp of eight or nine miles, with vasculum over my shoulder, during the hottest part of the day, and returned feeling no less fatigued than after a tramp of equal length on a hot July day in Michigan.

When one first glances over the broad mesa and, as far as he can see, nothing meets his eye but a stunted growth of the creosote bush and mesquite, with here and there various species of cacti, with their long skeleton-like branches covered with the sharpest of spines, extending upward in the hot sun, he is impressed that nature has not done her part in granting to this region such a meagre flora, but if he will turn his attention to the little things growing under the bushes, or study the flora along the rivers and irrigating ditches, he will continually meet with surprises. He will be astonished at the diversity of the flora in a region which at first glance looked so barren.

The most interesting part of the vegetation is the large number and variety of cacti found everywhere on *mesa* and mountain-side. It seems that no place can be too d or hot for them. The giant cactus, bar cactus, and various arborescent forms are t most conspicuous of the many species.

The giant cactus frequently grows to t height of 50 feet, and more than two f in diameter. In passing over the plain c will occasionally see the bleaching ribs one of these monster plants projecti twenty or thirty feet into the air, the s part having years before decayed aw: The Indians are very fond of the fruit this species, which they obtain by means a long, pointed pole.

It is a common expression that everyo goes armed in the West and South. I fi it even so with nearly all forms of vege tion. Trees, bushes and cacti are arm with the sharpest of spines, while if o stoops to pick an innocent looking annu the chances are ten to one that he will dr the plant to search for the cause of the pa in his fingers. Surely many of these plan which live and thrive under such adve circumstances represent the "survival of t fittest." Many are protected by a den coat of wool or down, which adds great in preventing the escape of moistu Others have mere rudiments of leaves, t green bark of the stem taking the place leaves in the economy of plant growth.

In the vicinity of Tucson as yet but litt land is under cultivation, only a small p cent of the agricultural products consum in the city being raised in the immedia neighborhood. Where irrigation is possib the crops are good and of a great variet A short distance back from the river, ev within the borders of the city, the soil parched and dry and of but little value f agricultural purposes.

There are many forms of animal life be of much interest to the naturalist. T number and variety of lizards are very grea Insects are numerous, especially beetle and nearly all are nocturnal. The rabbi are so numerous that a fine wire fence

necessary to keep them from the gardens. Tarantulas, scorpions and centipedes are frequently found about the grounds and buildings. Nearly every day something new is brought to my desk by one or more of the score of Mexicans working on the university grounds.

SCIENTIFIC.

Natural History Society.

At the regular meeting of the Natural History Society July 10, 1891, Professor Hillman gave a short but interesting talk on a few like species of butterflies, found in both Nevada and Michigan. Some of different genera were also described. The large colored drawings exhibited gave a very good idea of the different colors and markings. Such differences are probably brought about by environment. Elevation is doubtless an important factor in this matter, as hot climates always claim the most brilliant colors. Following this was a lecture on "The Law of Specialization" by Professor McFarland, of Olivet. We give a few notes on the main thought:

The law of specialization is well exemplified in the development of the human race. We may think of the primitive barbarian as little better than a domesticated animal, securing his own food, clothing and shelter without even a thought of outside aid. But perhaps one of his children develops something of skill in the manufacture of some special article, as that of arrows. This at once creates a demand that can be supplied only when others aid in furnishing the material. And here, for the first time, we have a division of labor, which, ultimately, is to result in a climax of some form of civilization; for specialization and organization walk hand in hand. But the law of this development is none other than the law of organic development. Suppose we examine, under the microscope, a bit of slime from some river or pond. One of the latest things seen would be a particle of jelly-like substance moving across the field. It is without definite form, and yet will contract when jarred, thus irritable. It passes around a bit of organic matter and absorbs it as food, excreting the waste, thus metabolic. It is known to take up oxygen and give off carbon dioxide, thus respiratory. And it is observed to divide when grown so large that the surface is unable to absorb food for the whole mass, and thus multiplies its kind. So here we have a simple disked cell of protoplasm (called an amœba), performing all the essential functions of life. We notice still another form. This time consisting, not of one cell, but of a whole colony of cells, in shape like the finger to a glove. A thread-like coil comes from the closed end and attaches to some stationary object. The other end is fringed with tentacles, probably concerned in securing food and passing it into the stomach through the open end. This animal, a hydra, is made up of two distinct layers of cells. The outside layer seems to be concerned largely in the matter of reproduction, while the inner layer of cells appears to be differentiated for the sole purpose of digestion. So here, for the first time, as with the barbarian, we have a division of labor (specialization), followed, or associated with a higher organization.

Numerous other low forms of life were described, especially those of salt water. But only enough is to be given here to present the thought and illustrate the law, which, if it holds good, makes even man, the highest of organized beings, none other than a great colony of amœba-like cells, some differentiated for protection, as in the skin, others for motion, as in the muscles, and still others for digestion, as in the stomach, etc., etc., throughout the whole body. This is evolution in its broadest sense.

The professor concluded with the thought that although Germany is taking the lead in the sciences, yet there is good prospects that America will soon be treading on her heels.

He suggests that we need a marine laboratory, together with stations along the coast, where the lower forms may be found in abundance, for the purpose of study. Such facilities would aid greatly in advancing the science of biology.

Clover and Free Nitrogen.

It is generally believed that plants do not take up free nitrogen from the air as an element of food. But an interesting experiment brought before the class in agricultural chemistry does not seem to accord with this view, at least as far as some of the leguminous plants like the clover and pea are concerned.

Two pots were carefully filled with clean, pure sand, first subjected to red heat to drive off all organic materials, and consequently all combined nitrogen. The ash elements essential to plant growth were then added and the pots watered with distilled water and planted to clover. Both pots thus far have received precisely the same treatment, and now to one is added a little watery solution of garden soil containing the microdemes whose work is to be noticed after some three or five months of growth. After this time the two pots are compared. The one receiving no microdemes has grown scarcely two inches tall; not a particle more than the nitrogen in the original seed would allow, while the other is many hundred times larger, a vigorous and healthy plant. On examining its roots they are found to be covered with little warts or tubercles. The roots of the small plant have none.

Two questions now present themselves. First, what caused these tubercles if not the microdemes? And secondly, as no combined nitrogen was added to the sand, what has been the office of the tubercles if not that of enabling the clover to take up and assimilate the free nitrogen of the air?

The botanic garden will hereafter be supplied with water from the artesian well. The laying of the pipes is nearly completed.

Kerosene Emulsion as an Insectici

Economic entomology has been mak rapid progress since the establishment experiment stations in so many of our Sta The leading and most important factor this work necessarily has been, and will the discovery and preparation of the s plest and, at the same time, the most eff ual insecticides that we can to combat more successfully with the hosts of in pests. If any household commodity can made a useful and effectual insecticide, for the same purpose, a combination of eral accomplish the same result with but tle trouble, we have a remedy that will the most likely to be used by those in n of such a weapon for warfare, viz.: always within reach. The arsenites various forms can be kept in supply, are easily applied with good effect. this reason they are the most commo used of any. Other contestants are ente the field of usefulness for first place, none at present seem to stand as goo chance as the kerosene emulsion in its var forms. It is made from water, soap kerosene—three of the cheapest and n common substances of the household sup

After repeatedly experimenting and ing the various formulæ given for prepa the emulsion, we have made a decided p erence for the proportions advocated used by Prof. Cook for several years. This was not because we were partial, because a stable emulsion could not be m satisfactorily when other proportions v used. The following is the manner which it is made. To two quarts of w add one quart of soft soap or one-fo pound hard soap, and heat the whole to boiling point. When the soap is dissol take from the fire, add a pint of keros and agitate so thoroughly with a f pump or some similar instrument that mixture will foam like milk when filling dairyman's pail on a summer evening. A

emulsifying it is ready for use as soon as diluted.

For the dilution we have always recommended adding enough water to make one part of kerosene in every fifteen of the dilute emulsion. We find, however, from experiments made on the foliage of various cultivated plants, that a poor quality of soap is much more apt to injure the foliage than an emulsion made from a higher grade of soap, and consequently a few such plants as pea and cucumber vines and rose bushes are injured by one to fifteen of the mixture. On the same foliage with a good grade of soap, we have been able to apply one to twelve without injury. As far as our experiments have been carried, preference seems to be considerably in favor of the hard soap for an emulsion. Less than a year ago a new form of this emulsion was first made known to the public as mentioned in the previous numbers of this issue. It has been experimented with by us quite extensively this season, and in comparison with the original emulsion, proves itself far superior in every instance. We may term it pyrethro-kerosene emulsion, as it only differs in making an extract of pyrethum by filtering the kerosene oil through the powder and then using the extract instead of the pure kerosene as in the other emulsions. By this means another excellent insecticide is enlisted, and by the two acting in unison the effect is the more certain and the more evident from the first. Another very interesting and practical point regarding this was developed by us in our work with it this season. While the effect upon the insects is greatly increased, the liability to foliage injury is proportionally lessened. By this two-fold result kerosene emulsion can be made to kill almost any insect with which it may come in contact.

Kerosene emulsion, be it in what form it may, and the specific poisons, as London purple and Paris green, each have a part to perform as an insecticide which cannot be accomplished by the other. The depredations of the codling moth could never be prevented by kerosene emulsion, as it kills only by actual contact. On the other hand the poisons have no effect upon the true bugs, as they feed only by sucking the sap from within. Reverse the two remedies, and we find both effectual. All soft bodied insects are very susceptible to a spray of the emulsion, and even those with hard shells have to succumb. It seems quite evident from the trials at this station and others, that nothing has yet been found equal to the emulsion for the rose chafer which has so long baffled the efforts of entomologists and horticulturists. The emulsion is about the only remedy that will destroy plant lice, and is also found superior to all other remedies in treating lice, ticks, etc., on our domestic animals. Thus we see that the emulsion must be a favorite remedy, because it is useful for so many pests, easily made, cheap, and effectual in its work.

G. C. DAVIS.

Professors Bailey, Wheeler and Hicks botanized at Pine Lake recently. Among other plants a species of sedge was found that was unknown to the whole three.

The number of teachers attending the summer school here is unusually large. In the chemical laboratory alone there are twelve special students at work. Several are doing special work in botany, entomology and physics. That the advantages of this college for such study are appreciated is shown by the number of teachers now in attendance, who were also here last summer.

No one visiting the college should fail to visit the experimental field on the farm. Experiments are in progress to determine the comparative value of different varieties of plants. The effect of crossing is being closely observed. Oats are being grown with deep and shallow cultivation, on soil ranging in texture from light sand to heavy clay. Forty-eight varieties of potatoes are being tested. Different plats are planted with one, two or more eyes in a hill. Some plats are planted in hills and others in drills, and some have deep and some shallow cultivation. The experiment with potatoes is in charge of E. S. Hake and is the most complete of any ever tried here. We shall endeavor to give some of the results at a later date.

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WITH this number the SPECULUM begins the eleventh year of its existence. Its financial prospects are in a fair condition, its subscription list now numbering over 600. Nine years ago the SPECULUM was a fourteen page quarterly, wearily struggling for existence; now it has grown to a monthly, and able to compete with any of our brother college papers. The retiring editor has introduced a new scheme of having persons outside of the college societies furnish literary articles. We like the idea very much, for we think the SPECULUM is read with more interest than previously, especially by the alumni. We shall endeavor to keep it up, but not to such an extent as to exclude the usual work of the societies. The new Board is aware of its responsibility, and of the task of conducting the SPECULUM for the coming year, but by the hearty co-operation of the students and alumni we shall endeavor to make the coming issues as good, if not better, than any of the past.

WE were somewhat disappointed to h that the new catalogue will not be out u about commencement. We understand i to be an improvement on the old catalog it is to be a little larger in size, a finer qual of paper, and several views of scenes on college grounds. There are some chan in the program, though just what, we unable to tell, with the exception of change in the senior fall term studies. T part of the program is very unsatisfactory say the least. Zoölogy and botany co the same hour, so those who wish take b are unable to do so. Agricultural engine ing is dropped from the course, and nothi put in its place. Those who do elect drill are obliged to take chemi physics. Yet senior studies are said to elective. To be sure the new rule passed the State Board, that manual labor for t seniors is hereafter compulsory, will acco partly for the inconvenience of arrangem of studies, but it does not excuse the facu from giving us more elective studies. Wh we see the whole program we hope it w not be as criticizable as the part mention The old catalogue was surely a poor adv tisement of the excellent training the c lege furnishes, and now that we are to ha a good advertisement of the college let eve student see that his friends are supplied w a catalogue, and that the college is prope represented.

THE last number of the SPECULUM stat that the new Board would probably publ a special number of the SPECULUM, to co out about commencement time, and to co tain portraits and sketches of the facul We are sorry to disappoint you, but t faculty, who were very much taken up w the idea at first, after further consideratı decided they did not wish their portraits a biographies distributed about the countı Recently on thinking over their life's h tory thought it would not look well print (?). It would only be necessary, ho

ever, to write their superior qualities, and we could not suggest any *souvenir* a student or an alumnus would prize more than a short sketch of his instructors at college, along with the history of the growth of his Alma Mater.

ALL those who have been or are connected with the college are aware that there has always been a deficiency in our work system. There has never been the interest taken by the students that there should be. It is generally known that one of the objects of an agricultural college is to perform experiments and report to the State the results of the investigations. But is it a good idea to have the professors do all the experimental work, and report to the students in form of lectures, or refer them to the bulletins they send out? It seems to us the ideal work of an agricultural college should be experimental work for each student. The student will not only take more interest in his work, but he will get more benefit from his labor. Our present Professor of Agriculture is trying this scheme, and from all appearances with excellent success. Students thus employed are not particular about working over hours, or quitting before the bell rings. The sophomores are each given a particular crop to grow, and referred to reading matter that they may gain full knowledge of its history and best methods of growth. The seniors that elect work on the farm are experimenting on the feeding of animals. This is a new experiment in the work system, and time only remains to tell its results.

ALL the students as well as the alumni should attend the alumni reunion on Thursday and Friday, August 13 and 14. It only comes once in three years, and the under graduates get but one chance of being present and hearing those that have gone before them. Stay that you may know how to act when you come back as alumni in the future, stay any way to show that you are patriotic.

The literary exercises will take place Thursday morning at ten o'clock. The program is as follows: oration by Hon. G. A. Farr, '70; poem by Frank Hodgeman, '62; history by Prof. C. P. Gillette, '84.

Thursday afternoon will be given up to business and class meetings, to be followed by a banquet in the evening. Friday morning Hon. A. E. Macomber, once with class of '61, will present an address on the work of President Williams, first president of the college, and Prof. A. J. Cook, a similar review of the work of Prof J. C. Holmes, the first Professor of Horticulture. If the weather permits, these papers will probably be followed by a picnic lunch on the college lawn.

AT a meeting of the Students' Organization held July 21st, the following resolutions were adopted:

WHEREAS, Our Heavenly Father, in the dispensation of his Providence, has permitted death to remove from us our beloved friend, Mrs. Friedericke Knapper; therefore be it

Resolved, That, as students of the Michigan Agricultural College, we do join in sympathy with the bereaved husband, who has been left to mourn the untimely death of a kind and loving wife, and as trust he may be able to see the hand of the loving Master, Christ, whose voice has called her to himself. Therefore be it

Resolved, That the husband, on whose heart the blow falls heaviest, we commend to the guidance and care of Him who careth for all, and trust the loss sustained will prove rich in spiritual blessings. Be it further

Resolved, That a copy of these resolutions be spread on our records, a copy sent to THE SPECULUM for publication, and also a copy to the bereaved husband in behalf of the Students' Organization.

H. W. MUMFORD,
EDWIN C. PETERS,
R. S. CAMPBELL,
Committee.

Ninety-seven volumes have been added to the library since June. Thirty-seven of these were donated. One gift deserves special mention, that of nine handsomely bound volumes of Rothamstead Memoirs on Agricultural Chemistry and Physiology, from Dr. Lawes. All the books purchased have been placed in the experiment station library. Valuable unbound donations have been received. Among them are six volumes from the Smithsonian Institute, and seven volumes of the *Electrician*, from Dr. W. F. Durand.

COLLEGE NEWS.

Commencement will be one week earlier than usual.

Secretary Reynolds has returned from his eastern trip.

E. A. Burnett is taking a vacation in the Eastern States.

Several new rustic seats have been ordered for the campus.

The Misses Perry, of Lowell, are the guests of Miss Sinclair.

Many visitors are seen upon the grounds nearly every day.

A hard wood floor will be put in the armory before commencement.

Mrs. F. S. Kedzie arrived in Lansing, from Germany, July 21.

Prof. Montgomery, of Olivet College, spent a day here recently.

President Clute spent a week at the Alma Sanitarium recently.

The new catalogue will probably be out before commencement.

Ex-President Fairchild, of Oberlin College, is the guest of Dr. Kedzie.

The building of a new greenhouse was authorized by the State Board, July 10.

The Phi Delta Thetas entertained their lady friends on the evening of July 17.

Professor Grawn and family have returned to their home in Traverse City.

Mrs. Holdsworth and Mrs. Reynolds are visiting in the northern part of the State.

The dormitories have been thoroughly cleaned and are now in good condition.

Miss Anna Watkins and Miss Fredrika Baldwin have been visiting their brothers here.

A. T. Sweeney will have photographs of all the old professors for sale during the alumni reunion.

Miss Fredrika Johnson, a student at Oberlin, visited friends here during the first part of the month.

H. S. Cannon, '88, now of the law department of the U. of M., has been visiting old friends here.

The crops on the Experiment Station at Harrison are reported as being in fine growing condition.

The unsightly place in front of the forcing-house has been transformed into a well arranged parterre.

The July number of the *Grange Visitor* contains an article on Education which everyone should read.

The Olympic Society boys have made quite extensive improvements in their rooms in Williams Hall.

Professors Thurtell and Corbin were initiated in to all the mysteries of the Grange at Lansing a short time since.

Messrs. Butterfield, Phelps and Garfield, of the State Board of Agriculture, attended chape July 10.

G. J. Jenks, '89, has been here for a short yzing brine from Sand Beach to determine for farm use.

The indications are that the next fresh will be very large. Several applications ha been received.

On July 24 the Juniors held class-day e Grand Ledge. In the evening a farewell ba given to the Seniors.

L. E. White, '92, has left college. He quite extensively through the Eastern Stat turn to Cornell in the fall.

Plans for hot-water heating will soon be President's house, the Horticultural Labor the south end of College Hall.

It is probable that the foundation of the n cal Laboratory will be begun soon. The work will not be commenced until spring.

The Hesperian Society will hold its comm banquet on Friday evening, August 7. societies all banquet on the following Tues

The question of a street railway from L the college is being freshly agitated. It no though there was some chance of our having desired road.

Prof. McFarland's lecture in the chapel was well attended. The lecture was of a nature and was secured by the Natura Society.

A project is under way to construct a qu running track near the parade ground. P has been obtained from the faculty, and wo begun next term.

While in Germany last winter, Prof. Fran purchased, for use in the laboratory here, seve of apparatus of a much finer quality than an be procured in this country.

Tuberculosis has appeared among th swine. The lungs of the diseased pigs hardened, presenting a different appeara those of cattle similarly affected.

The stewards of clubs for next term are as Club A, W. Paddock; Club B, A. T. Steven E. H. Pelhamus; Club D, G. A. Hawley; C A. Hathaway; Club F, C. R. Winegar.

The Juniors were entertained at the hom Cook on the evening of July 17. The mus drum corps (?) was not fully appreciated as tertainments were in progress at the same ti

A few days ago Prof. Cook received a spe the southern "cow killer," *Mutilla occidenta* Alabama. It is an insect about an inch in le brownish black color, with bright markin said to have a sting much more powerful tha our common bees.

The Farm Department is making a unique collection. When completed it will consist of the pitman bars of every known kind of mowing machine. The gearing of any one can then be easily compared with that of others.

The Botanical Department will soon provide new labels for the plants in the wild garden and the "delta," and the trees and shrubs growing on the campus. This will be of great advantage to those wishing to make a special study in this direction.

The Michigan Farmer of July 18 contains an editorial which every person who has any interest in the Agricultural College should read. We do not intend to criticise the article, but will simply say that it is much the same as several others that have appeared in the same sheet.

At a recent meeting of the State Board of Agriculture Prof. Wing, who is at present Assistant Professor of Mathematics at Cornell University, was elected to the chair of Mathematics and Civil Engineering at this college. E. A. Bennett was made Assistant Professor of Agriculture with a salary of $1,000 a year. Mrs. Landon, of Niles, was elected to take Miss Sinclair's place as librarian. G. H. Hicks was appointed instructor in botany, W. Babcock instructor in mathematics, and C. F. Baker instructor in zoology.

FUTURE OCCUPATIONS OF '91.

C. P. Locke will study law.

A. H. Kneen is undecided.

F. W. Ashton will study law.

Grace Fuller will take a vacation.

C. E. Cook will follow farming.

C. P. Weidenman will attend the U. of M.

E. P. Safford will work at civil engineering.

W. O. Hedrick will teach near Harbor Springs.

Jessie Foster will attend the State Normal School.

H. S. Winegar will teach for a time and then farm.

M. W. Mumford will follow farming at Moscow, Mich.

M. E. Greeson will attend the Philadelphia Veterinary College.

C. A. Udell will take a course at the Chicago Veterinary College.

Geo. A. Waterman will accept the first good job that comes along.

Alex. Gordon will take a post-graduate course in botany under Dr. Beal.

V. M. Lowe will remain in Prof. Cook's laboratory and study entomology.

C. F. Baker will remain here and be known as Instructor in Zoology.

B. A. Holden expects to take a course in civil engineering at the U. of M.

A. C. Sly has been elected Commissioner of Schools in Roscommon county.

G. A. Goodenough will follow some line of mechanical work, probably as a teacher.

W. Enders will apply the principles of mechanical drawing in a draughting office.

C. F. Wheeler will receive his degree and then continue in his present line of work, botany.

A. T. Sweeney has been offered a good position in Chicago, which he will probably accept.

K. L. Butterfield will remain here as Assistant Secretary of the State Board of Agriculture.

V. S. Hillyer says: "I am not quite certain what I will do, but I shall probably work in a machine shop."

R. J. Crawford will continue his work as teacher at Richmond, Mich. Some time in the future he will be a farmer.

A. R. Locke will be interested in farming for a time, and will go into some permanent business in a year or two.

Mrs. F. H. Hillman will return to Reno, Nev., immediately after commencement. The professor begins his fall term early in September.

S. C. Duncore has a fruit farm of five hundred acres at Lake Side, California. He will be engaged in the cultivation of oranges, grapes and figs.

PERSONALS.

We desire the earnest co-operation of every person who has ever been connected with the college in trying to make this department an interesting one. Let every alumnus and every person who has been with classes here send in news to the editor of this department, often, thus making his work much easier and the department more interesting to all.

The personal editor gratefully acknowleges access to the files of letters received from alumni by Prof. Frank S. Kedzie, secretary of the association. The three hundred and fifty replies received will permit personal mention in but a few cases. We hope no alumnus will feel slighted should his name not appear in this issue.

The following alumni have expressed the intention or possibility of being present at the reunion:

'61.

Adams Bayley.

'62.

Pres. O. Clute,
Prof. A. J. Cook,
Frank Hodgman.

'66.

Geo. W. Harrison.

'67.

W. W. Tracy.

'68.

Geo. F. Beasley,
Frank S. Barton,
A. G. Culley,
Wm. D. Place,
Jno. Swift.

'69.

Jas. Satterlee.
Jno. S. Strange,
R. Haigh, Jr.,
Paul J. Wilkins.

'70.

Hon. Chas. W. Garfield,
Geo. A. Farr,
A. H. Pinney,
C. S. Williams.

'71.

Prof. Byron D. Halsted,
Geo. D. More,
T. A. Sessions.

'72.

Carrol E. Miller,

'73.

F. L. Carpenter,
E. T. Halstead.

'74.

C. L. Bemis,
Dr. F. J. Groner,
Henry A. Haigh,
Prof. C. L. Ingersoll,
Henry P. Jenney,
Arthur Lowell,
Donald MacPherson,
D. C. Oakes,
Rev. M. T. Ranier,
Jay Sessions.

'75.

B. A. Nevins,
W. L. Carpenter,
Chas. Goodwin,
Dean F. Griswold,
D. C. Postle,
Geo. A. Royce,
Frank J. Annis.

'76.

Cates L. Stannard,
W. B. Jakways,
C. F. Bangs,
Jas. Brassington,
E. D. Brooks,
Wm. Caldwell,
R. A. Clark,
W. J. Sloss,
J. E. Taylor.

'77.

Chas. Bloodgood,
Albert Dodge,
C. I. Goodwin,
Mason W. Gray,
E. H. Hunt,
W. C. Latta,
A. D. Peebles,
Jno. A. Poucher,
Bion Whelan.

'78.

Prof. Eugene Davenport,
H. E. Emmons,
Chas. C. Georgeson,
R. H. Gulley,
Enmor O. Laid,
Frank E. Robson,
F. E. Skeels,
Clement J. Strang,
Prof. J. Troop,
E. D. A. True.

'79.

Ray Sessions,
Mrs. Wm McBain (Eva D. Coryell),
Chas. S. Guile,
O. P. Gulley,
Chas. E. Sumner.

'80.

Cyrus T. Crandall.

'81.

H. T. Bamber,
Carroll W. Clark,
A. E. Smith,
W. S. Delano,
C. A. Dockstader,
Arthur Jones,
Chas. M. Kenney,
Walter I. Lillie,
D. S. Lincoln,
Chas. W. McCurdy,
Edw. C. McKee,
Alva Sherwood,
W. G. Simonson.

'82.

Lincoln Avery,
E. N. Ball,
Jno. W. Beaumont,
Jos. E. Coulter,
Mrs. Alice Weed Coulter,
L. B. Hall,
J. H. Irish,
E. D. Mills,
Theo. F. Millspaugh.

'83.

A. C. Bird,
L. A. Buell,
A. M. Emery,
O. C. Howe,
Jno. S. Matthews,
F. F. Rogers,
J. H. Smith,
Sarah E. Wood.

'84.

Milton Delano,
Chas. Baker,
J. R. Abbot,
Jno. I. Breck,
Llewellyn Bonham,
Jno. J. Bush,
Jas. D. Hill,
Miss Alice A. Johnson,
Calvin C. Lillie,
H. D. Luce,
Benj. C. Porter,
C. E. Smith,
Wilford C. Stryker.

'85.

Jas. A. Dart,
Geo. Morrice,
H. E. Thomas,
Hubert M. Wells,
F. M. Woodmansee.

'86.

W. H. Clemons,
J. B. Cotton,
O. O. Dunham,
R. W. Edling,
Geo. S. French,
J. E. Hammond,
Jno. Hooker,
Henry N. Jenner,
Wm. R. Rummler,
Geo. L. Spangler.

'87.

I. B. Bates,
Frank R. Smith,
E. A. Burnett,
Geo. C. Crandall,
O. C. Wheeler,
Chas. S. Whitmore,
H. H. Winde.

'88.

Louis A. Bregger,
A. E. Bulson,
H. B. Cannon,
Prof. Nelson S. Mayo,
Mrs. M. C. Mayo,
R. H. Cary,
Chas. B. Cook.
Arthur B. Cordley,
Frank J. Free,
F. H. Hall,
Prof. F. H. Hillman,
Glen D. Perrigo,
D. A. Smith,
Wm. F. Staley.

'89.

F. N. Clark,
E. A. Holden,
A. G. Wilson,
A. D. Baker,
Lemuel Churchill,
Louis A. Clinton,
Will Curtis,
Gager C. Davis,
W. E. Davis,
Perry G. Holden,
O. C. Hollister,
A. L. Marhoff,
Harry A. Martin,
Jno. W. O'Bannon,
Edw. N. Pagelson,
Frank M. Payne,
W. S. Palmer,
L. W. Rice,
Hobart A. Stewart,
R. H. Wilson.

'90.

Jay R. McColl,
Chas. Ferris,
Jos. Foster,
Harris F. Hall,
Howard J. Hall,
R. B. McPherson,
W. W. Morrison,
J. H. F. Mullett,
B. F. Simons,
Ed. A. Stricker,
O. A. Turner.

'61.

A. F. Allen, Vinland, Kan., makes no boasts of phenomenal success, but shows a life so full of work for himself and his brother farmers that only a man of large capabilities could keep it from flat failure.

'64.

Lewis Vanderbilt, Pittville, Cal., regrets that the distance prevents his attending the triennial reunion.

'67.

L. A. Hurlburt will attend the reunion in spirit and his orange grove near Crescent City, Fla., in person, during commencement week.

'70.

Roswell Little sends a double address. His summers are passed at Coopersville, Mich., and his winters in Wesson, Miss.

W. W. Reynolds regrets that his farm near Cassopolis will demand his attention during the reunion.

'71.

P. H. Felker and Richard M. Slocum can extend sympathy to the novitiates on the Speculum board. Both guide the editorial pen; the former in St. Louis, Mo., the latter in Mound City, S. Dakota.

'72.

The letter sent to Jno. T. Frazer was returned with the following, written by M. J. O'Brian of Savannah, Ga. "I am sorry to inform you that Jno. T. Frazer died here August 28, 1889, and I buried him here."

'73.

Prof. R. C. Carpenter, of Cornell, found a ball game in progress to welcome his return, July 22.

Jas. L. Morrice is deputy county treasurer of Emmet county. However, he puts "farmer" before it in his list of occupations.

'74.

William Cook still gives his best efforts to his farm at Britton, S. Dakota.

Geo. W. Mitchell divides his time between his fruit farm and saw-mill at Newberg, Ore. He writes, "We saw some big logs, as much as sixty-four inches diameter. Cut one tree that was seventy-one inches across the stump inside the bark, which was ten inches thick. It cut two hundred in length of logs, which scaled over 22,000 feet. Seventy-eight feet of top left."

'75.

In commenting on his success, postmaster E. A. Nevins, of Otsego, Mich., admits that he draws his salary as promptly and regularly as any incumbent could do.

Dean F. Griswold, Northville, is one of the farming minority who can report, "Out of debt and money to loan."

'76.

H. S. Hampton and Donald H. Kedzie send the association secretary their regrets; the former from Bellevue, Idaho, the latter from Lordsburg, N. M.

Dr. S. P. Tracy, Sault Ste. Marie, writes that F. H. Brown, with the same class, is city surveyor at the Soo.

WITH '77.

A. E. Wood is in the milling business at Woodville, N. Y.

'78.

Robt. T. McNaughton is a landscape gardener in Tacoma, Wash., the Chicago of the Pacific coast.

'79.

R. B. Norton is in the insurance business at Guthrie, Oklahoma Ter.

'81.

Geo. W. Grover sends items and regrets from Hartford, S. Dakota, where he is agent and operator for the C., St. P. & M. R. R.

Mrs. M. J. C. Carpenter slights the degree conferred by Alma Mater, preferring to substitute that of "M. A."

'82.

Prof. L. H. Bailey, of Cornell, made M. A. C. a short visit a few days since.

From the *Detroit Tribune* of June 22 comes a clipping describing a most pleasant surprise to W. L. Snyder, taking the shape of a beautiful clock and lamp, from the pupils of the Sunday-school of the Church of Our Father to their superintendent.

H. T. Langley is Superintendent of Schools at West Superior, Wis.

Mrs. Alice Weed Coulter constitutes an entire, self-appointed board of "home missions" at her Grand Rapids office.

'83.

Edmund Schoetzow gives notice of removal from Volinia to Marcellus, Mich., where he is principal of schools and a member of the county board of examiners.

H. W. Baird will "reune" with other members of his fraternity at Charlevoix, during August.

'85.

Ed S. Antisdale is now at Berrien Center, a practicing physician. Mrs. Antisdale, a sister of E. T. Gardner, of '85, died a few weeks ago, leaving an infant daughter.

'86.

"Dick" Edling will leave his prescription counter to renew acquaintances at the triennial.

'88.

L. H. Dewey writes, "I visited the agricultural colleges of Texas, New Mexico and Arizona on my Western trip, but found nothing equal to M. A. C." He promises a description of them for a future SPECULUM.

Prof. L. C. Colburn, of the University of Wyoming, writes: "I am very busy fitting up my department. Nieswander is here hard at work, making war on the insects of the State. Be sure to send the SPEC."

'89.

W. E. Rhoaert writes in true real estate style from his Washington home: "Oconto is the future 'big Iowa' of the Pacific coast."

'90.

L. W. Spaulding regrets his SPECULUM sent to Calumet, where he is employed in the shops of the Centennial Copper Mine.

Cards are received announcing for August 4th, the wedding of Miss Blanche Long and W. W. Morrison, at Bryan, Ohio.

WITH '91.

Harry H. Hunter sends regards to his college friends, enclosed with his renewal for the SPECULUM.

WITH '92.

Dennis Miller attended the junior reception given lately by Professor Cook.

COLLEGES AND EXCHANGES.

The subject of examinations as they are conducted in our colleges, is discussed in the last issues of *Science* and the *Ivory Pharmac*. Both advanced similar ideas, that is, a change in the system is ne de.

That what a student can write on a subject in an hour or two when his mind is in a state of excitement is not a fair test of his knowledge. The following is from the *Anchora*:

"Most students enter the examination room with the feeling of one with a patched broadcloth coat who enters the society of his friends. He is ill at ease. He clasps his knees and prays within himself, 'His good will have mercy upon me, and give me an easy question!' Now we know that some students have studied faithfully and can enter with a great deal of self-confidence. But to most it is a period of anxious sospense. It consists of lingering about the campus for three days, agreeable company to nobody and a burden to everybody. For you cannot be social and you involuntarily speak of what will be asked upon examination. No one will come to speak to you for you have a book under your arm."

The address delivered to the graduating class of Rensselaer Polytechnic Institute by Charles MacDonald appears in the last issue of the *Polytechnic*. It is full of very practical advice to engineers and a large part of it might be taken as such by others. The theme of his discourse is stated in the following brief extract: "The accurate use of knowledge is the true measure of its value. It matters not how much information the student may carry away with him from college; if he has not acquired accurate methods he is worse than useless to his employer."

It is said that no graduate of Vassar has ever been divorced from her husband. It is quite evident that the author of the following little verse did not have this in mind, and did not appreciate the true worth of our college co'eds:

"Oh college maid,
So bold in bookery,
Why thus afraid
Of common cookery."

The annual field days of the M. I. A. A. have been, to most college students, most pleasant events, and the contests of the most friendly nature. We sincerely hope that nothing may come in the way to make them otherwise. We copy an extract from the Olivet *Echo*, not because it is intended to promote good feeling, not because we wish to agree or disagree with it, but we are surprised at its appearance. "In spite of the childish criticism made by the defeated and dejected visitors from another college, on the entertainment they received while here, Olivet may well congratulate herself on having made a success of the Fourth Annual Field Day, though opposed by unfavorable weather, limited means and cranky Albionites."

Said Atom unto Molly Cule:
"Will you unite with me?"
And Molly Cule did quick retort,
"There's no affinity."

Beneath electric light glan'e's shade,
Poor Atom hoped he'd never,
But she eloped with a rascal base,
And her name is now Saltpetre.

—*Ex.*

ATHLETICS.

Athletics at the U. S. Naval Academy

Having been requested to give a sketch of athletics at the U. S. Naval Academy as it was from 1876 to '8 I have complied in so far as the following hasty an imperfect sketch may answer the purpose in view.

First as regards plant, i. e., buildings and equipment. The gymnasium was a building erected on small octagonal fort as foundation, and it therefo partook of the same general shape. It was two stori in height, the roof rising from all sides as an octagon pyramid, giving in the center of the second floor lofty clear space for swinging trapeze, rope ladder etc. Only a portion of the first floor was utilized f gymnasium purposes. Here were located the bow ing alleys, two in number, well stocked with balls an ten-pins.

On the second floor was the gymnasium proper This floor consisted of the main central room, oct gonal in shape, about seventy-five feet in diamet with a closed-in promenade or gallery about eig feet wide extending nearly around the outside. I this outer gallery were located various pulling an rowing weights. The main floor was fairly well su plied with the apparatus in use at that time, consi ing of dumb-bells and Indian clubs, horizontal bar parallel bars, double swinging trapeze, rope an wooden ladders, horses for jumping and vaulti spring-boards, etc. The gymnasium was always op during recreation hours for voluntary practice, and was rare to enter at such times without finding som engaged in such work.

The regular or required gymnasium work was on a week during the Sophomore and Junior years. Th exercises in the Sophomore year consisted of gener gymnasium work, including running, jumping, vaul ing, simple exercises on horizontal and parallel bar use of weights, dumb-bells, Indian clubs, calisthen exercises, etc.

The work of the Junior year was in boxing.

In addition to this range of exercises there was r quired work in fencing and broad-sword exerci amounting to about one exercise a week for near the four years. About three-fourths of this time w given to fencing or exercises with the small sword foil. The remainder was devoted to broad-swor and single-sticks. The instructors in these exercis were a French master, and two assistants from th border country between France and Germany.

In addition to the required work in fencing the was opportunity one evening in each week, to tak special or elective work in these same lines, and man availed themselves of this opportunity. On such o casions there was more opportunity for personal e gagements with the instructors from which much mo could be learned than when simply attacking ea other in pairs under their supervision.

The exercises thus noted comprised the indoor athletics.

In outdoor athletics, base-ball was the principal game. There was an academy nine, which did excellent work and ranked well with surrounding institutions. Each class also had its own nine, and class games were played much as at M. A. C. Foot-ball was then in its transition stage from the old game of twenty years ago when it was *foot*-ball and was only kicked, to the modern form of the game as we find it to-day. Foot-ball was therefore played but little, though an occasional game kept us from forgetting it altogether. Lawn tennis was then in its infancy in this country. The Naval Academy was one of the first places in the United States where it was played. During those years however, it gained no foothold among the students. It was brought there by officers who had become familiar with it among the English, and to the officers it was restricted. Among them however it became exceedingly popular, and their great enthusiasm over a game which seemed to consist simply in knocking a little soft ball back and forth over a net prejudiced many of the students against the game before they became familiar with the rules and particular points which made it justly so great a favorite. Lacrosse was also played to some extent, and having, as it does, some features of both tennis and foot-ball, it in a measure answered for both.

For track athletics, there was a track of about one-quarter mile, kept in good order and always available for walking, running, etc. The athletic events of the year were two in number, a tournament, as it was called, for general indoor athletics, and a field-day for out-door sports. The Naval Academy was connected with no other institution, and so the events were purely local in interest. The tournament usually took place in the winter, the field-day in spring. At the former all of the usual in-door sports were contested for. Fencing, among the more unusual, formed an important part. At the field-day the sports usual on such occasions were contested for, with sometimes the addition of such events as climbing a greased pole or catching a greased pig, by way of amusement.

It may be surprising that nothing has been said about shell racing. This form of college athletics has never reached a high degree of development at the Naval Academy for the simple reason that a crew, in order to make any show whatever in a race, must have time to train and practice together. There, nothing was excused, no regular duty was ever remitted on account of athletics, and consequently a boat crew had no chance to do themselves justice. Most of the classes, however, had shells, and considerable use of them was made in season, but they never entered largely as a component part of the so-called athletic sports.

In the time which has since elapsed the subject of college athletics has received an enormous impetus, and has undergone great development. It is to be presumed that the Naval Academy has partaken of this development, and that the above sketch is by no means a fair exposition of their present state in this matter. The sketch will not, perhaps, be without interest however, as showing the condition of athletics from twelve to fifteen years ago at an institution which aimed to give to such subjects a fair representation.

W. F. DURAND.

The affairs of the M. I. A. A. have at last been straightened out and satisfactorily settled for the season. We owe many thanks to our representative for his sincere and hard work for the interests of the colleges. It is hoped that the Association will elect its new committee this fall, that they may devise a new constitution more in harmony with the present demands than that under which it now exists.

The ball game which occurred upon the grounds, July 22, between the Battle Creek Y. M. C. A. and home teams, resulted in the following score:

	1	2	3	4	5	6	7	8	R.	BH.	E.
B. C. Y. M. C. A.	1	0	0	0	1	0	0	0	2	5	13
M. A. C.	7	1	6	0	0	0	9	*	23	6	2

Base on balls, B. C., 1. M. A. C., 5.

Burnett struck out 10 men, Cregg struck out 6. The most interesting play of the game was the put-out on 1st, made by Burnett to Rittinger.

Arrangements have been made to build a quarter-mile racing track next term. It will be situated around the present ball grounds. The estimated cost this fall to the students will be $45, in order to get the track graded. Next spring, by making use of the college cinders, it is expected not to cost more than $40 more to complete a first-class track.

It is hoped that all athletes, as well as all students, will take advantage of the increased facilities for training, and raise the athletic standard of the college, and at the same time develop our best material for the contests in the coming field day.

Student (reading Virgil): "'And thrice I tried to throw my arm around her—,' that was as far as I got, professor." Professor—"That was quite far enough; you may sit down."

"I was told to-day that a couple of burglars tried to rob Jay Gould's safe the other night, and they actually got in among his railroad securities." "Were they discovered?" "No; they were glad to get away alive. The water was very deep, and it seems that neither of them could swim."

The recent erection in the City Hall Square of Brooklyn of a statue of Henry Ward Beecher, gives a peculiar interest to the little pamphlet just issued by Fords, Howard & Hulburt, detailing the Beecher memorial service lately held at Plymouth Sunday-school.