

# The M. A. C. RECORD.

MICHIGAN STATE AGRICULTURAL COLLEGE.

Vol. 9.

LANSING, MICHIGAN, TUESDAY, MAY 24, 1904.

No. 35

## M. A. C. 3, WISCONSIN 2.

Wisconsin beat Michigan 3 to 0 and lost 1 to 3. They lost to Chicago 8 to 6 and won 4 to 2. They beat Northwestern 5 to 3 and 14 to 2. They won from Illinois 5 to 4, and from Minnesota two one-sided games, the last one 9 to 3. Wisconsin leads so far with Chicago second, Illinois third and Michigan fourth. This aggregation succeeded in locating M. A. C. after doing a little telegraphing. It is safe to assume that they have located this institution very definitely and will find no difficulty in the future, in fact the job is much simpler than giving a mathematical solution of Hyde's curves. Wisconsin has a well balanced team. Their fielding was excellent and time and again saved a single and a two-bagger.

The game was full of excitement from start to finish. Several times things looked bad for M. A. C. but fine work saved the game. Not a score was made after the third inning until Ellsworth scored in the fifteenth. He secured a hit, which Burke sacrificed to second. Towner hit to short which reached third too late to catch Ellsworth. Towner stole second and Bowditch hit a fast one to third on which Ellsworth scored, thus winning the game. In the sixth Wisconsin had three on bases with one out. The next batter flew out to short and the third one hit a long fly which Bowditch captured. In the fourteenth, Wisconsin again filled the bases with nobody out. A fast double from Hyde to Chapman to Burke cut off the run and put the batter out at first. The next man was hit and again the bases were full. Wisconsin still had a chance but Hyde struck out Brush and the game was still a tie.

M. A. C. got two runs in the second by two bases on balls, a passed ball and a two-bagger by Bowditch. Wisconsin's runs were the result of an error, an infield hit fielded too late and a wild pitch. The "rooting" was excellent. Wisconsin was given good treatment and the best of feeling prevailed. After the ninth inning, the bleachers stood on their feet for the next six innings. Byron is an ideal umpire. His decisions were never questioned and he allowed no one to get beyond the wires.

A large number of students painted the city in the evening. The business men were as enthusiastic as the students, a thing not very common in college towns.

	AB	R	H	PO	A	E
Persons l. . . . .	6	1	1	3	0	0
Gates m . . . . .	7	1	0	2	0	0
Holtz s s . . . . .	7	0	0	2	3	0
Perry 2 . . . . .	5	0	1	4	5	0
Roys r . . . . .	6	0	1	0	2	0
Lewis p . . . . .	6	0	0	0	4	0
Leahy c . . . . .	6	0	1	17	3	0
Whitmore i . . . . .	5	0	1	12	0	0
Brush 3 . . . . .	5	0	0	3	2	2
	53	2	5	*43	19	2

\*One man out when winning run was made.

M. A. C.	AB	R	H	PO	A	E
Armstrong s . . . . .	6	0	1	3	2	2
Millar 3 . . . . .	6	0	0	3	4	0
Canfield m . . . . .	6	0	3	0	0	0
Chapman c . . . . .	6	0	1	14	4	0
Ellsworth 2 . . . . .	4	2	1	2	4	1
Burke 1 . . . . .	5	0	2	18	1	2
Towner r . . . . .	5	1	0	2	0	1
Bowditch l . . . . .	6	0	1	2	0	0
Hyde p . . . . .	5	0	0	1	9	1
	49	3	9	45	24	7

Earned runs, M. A. C. 1; Wisconsin 0. Struck out, by Lewis 16; by Hyde 11. Bases on balls, Lewis 3; Hyde 2. 3-base hits, Canfield, Perry. 2-base hits, Canfield, Bowditch. Double play, Hyde to Chapman to Burke. Umpire, Byron. Attendance 1000. Time, 2:30.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
M. A. C.	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1
Wis.	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0

Runs, M. A. C., 3; Wisconsin, 2. Hits, M. A. C., 9; Wisconsin, 5.

The features of the game were the batting of Canfield and the battery work of both teams. Hyde and Lewis pitched star games, but Hyde had the better of the argument. Both catchers did excellent work. Chapman steadied the whole infield and studied the batters well. Bowditch's 2-bagger with two men on bases came in very opportunely. Lewis shut out Michigan in the first game and is one of the best pitchers in the university league. He is captain of the team.

## ALBION VS. M. A. C.

Next Thursday Albion comes to M. A. C. for a championship game. The faculty at Albion has granted a half holiday and the entire college population will engage a special and come to M. A. C. They will have blood in their eyes and will do everything in their power to win the game. If we can beat them, Albion will have to play Hillsdale in the finals and we will put it all over the winner. If we lose, Albion, Hillsdale and M. A. C. will tie for the finals. Under no conditions must such a thing occur. Everybody should be out and do some consistent "rooting" at the right time. Let us also give our visitors a royal welcome and a hearty farewell, win or lose.

## M. A. C. 14, OLIVET 6.

M. A. C. left for Olivet Saturday morning for the third championship game and came home victors. Millar pitched a steady game and received almost perfect support. In the sixth inning, a combination of 3 hits, a base on balls and an error gave Olivet 4 runs. A passed ball, 2 hits and our second error were responsible for the two runs in the eighth inning. Olivet gave the boys excellent treatment.

	1	2	3	4	5	6	7	8	9	R	H	E
Olivet.	0	0	0	0	0	4	0	2	0	6	8	12
M. A. C.	7	2	0	0	0	2	0	0	3	14	10	2

Battery, M. A. C., Millar and Chapman; Olivet, Atwood and Bishop. Struck out, by Millar 9, by Atwood 3. Bases on balls, Millar 1, Atwood, 1. Lewis of Olivet secured 3 doubles in four times at bat. Umpire, Phillips.

## M. A. C. 56 1-2, ALMA 28 1-2.

In the dual meet at M. A. C. last Saturday the home team had no difficulty in defeating Alma. It demonstrated that M. A. C. has a strong well-balanced team. Alma has only two men, Schenck and Johnson, who will figure in the field day events. Schenck is a star runner and the one who beats him in the quarter and the half will win these two events.

100 yds.—Moon, M. A. C., 1; Graham, M. A. C., 2; Schenck, Alma, 3. Time, 10 1-5.

220 yds.—Pearsall, M. A. C., 1; Carr, Alma, 2; Bennett, M. A. C., 3. 24 sec.

440 yds.—Moon, M. A. C., 1; Schenck, Alma, 2; Graham, 3. Time, 53 sec.

880 yds.—Schenck 1; Verran, M. A. C., 2; Therry, Alma, 3. Time, 2:10 1-5.

One mile—Burrell, M. A. C., 1; Holdsworth, M. A. C., 2; Therry, Alma, 3. 5:16 3-5.

Two miles.—Waite, M. A. C. 1, Graham, E. R., M. A. C. 2, Darbee, M. A. C. 3. 11-29 1-5.

120 hurdle.—McKenna, M. A. C. 1, Kratzenburg, Alma, 2, Martin, M. A. C. 3. 18 2-5.

220 hurdle.—McKenna, M. A. C. 1, Martin and Kratzenburg tied for second. 27 1-5.

Discuss.—McCallum, Alma, 1, Kratzenburg, Alma, 2, McDermid, M. A. C. 3. 99 ft. 6 1/2 in.

Hammer.—Johnson, Alma, 1, McKenna, M. A. C. 2, Kratz, M. A. C. 3. 111 ft. 2 1/2 in.

Shot.—Kratz, M. A. C. 1, McDermid, M. A. C. 2. 35 ft. 10 in.

Running high jump.—Burnett, M. A. C. 1, Small, M. A. C. 2. 5 ft. 3 in.

Relay.—M. A. C. 1, Alma, 2. The shot and jump did not count in the final score. Neither had Alma men for vaulting and broad jump.

A half mile exhibition was run by M. A. C. men in which Rogers took first, Hart second, and Kimball third. Time, 2:18 1-5.

Moon, Graham and Pearsall in the sprints, McKenna in the hurdles, Burrell and Waite in the long runs, were the features. Waite has more endurance than two ordinary men. So far, no one has been able even to tire him.

'93.

Hon. L. Whitney Watkins was elected alternate delegate-at-large to the National Republican Convention at Chicago. The convention at Grand Rapids adopted Fred M. Warner's primary election platform by an overwhelming majority.

'03.

O. O. Churchill, instructor in agronomy, has been offered a position in the North Dakota Agricultural College as experimenter in grain breeding at a salary of \$1000. He will undoubtedly accept the offer.

J. R. Thompson is round house foreman for the Chicago, Milwaukee & St. Paul Railway at Davenport, Ia.

## ALUMNI.

'95.

G. W. Rose is now in charge of the Cyanide plant at Octave, Arizona.

With '76.

Grant M. Morse, formerly state game and fish warden of Michigan, is now located at Des Moines, Iowa, as local manager for a St. Paul commission house.

'90.

A. L. Waters has been reappointed general manager of the Keystone Copper Smelting Co. of Philadelphia, with mines in Jalisco, Mexico.

With '94.

Llewellyn Reynolds of Chicago is now superintendent of the Keystone Copper Smelter Co.'s mines at Tapalpa, in Jalisco, Mexico.

'95.

Thorn Smith is still in Tennessee holding down the position of chemist for The Ducktown Sulphur, Copper and Iron Co. He is engaged in original work at present, the nature of which has not yet been divulged, but is full of promise. He occasionally does outside work such as assaying ore for copper. Mr. Smith is becoming well known as an expert analyst and a reliable assayer. His contributions to the alumni column are timely and much appreciated.

'03.

Miss Hettie Wright, in charge of domestic science and art in the "Soo" schools, expects to be at the College during commencement week.

'99.

Rev. W. R. Kedzie, pastor of the Vicksburg Congregational church, was elected assistant scribe of the Michigan Association of Congregational churches.

With '99.

Almus R. Speare, who holds a position in the water department of the District government, is engaged at the new Trumbull St. pumping station which will operate the big filtration plant now under construction. His address is 1524 U St., N. W., Washington, D. C.

With '01.

Sidney M. Rochester is baggage-man on the Pere Marquette R. R. from Ionia to Freeport. He made a call at M. A. C. last week Tuesday.

'00.

R. M. Lickly has recently been appointed draftsman for the American Locomotive Co. at Richmond, Va. In addition to numerous blue prints previously contributed to the Mechanical Department, he has lately forwarded a set of prints of a switching engine. Mr. Lickly has been very thoughtful in regard to the needs of the department and it is hoped that others among the old students will take note of this fact.



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TUESDAY, MAY 24, 1904.

WOMAN'S CLUB BANQUET.

The first annual banquet of the M. A. C. Woman's Club was held Thursday evening, May 12, at the home of President and Mrs. Snyder. The occasion was one of genuine pleasure to both guests and members. About forty were seated at the long table decorated in green and white and extending through dining room and parlor. Never were hostess more charming, nor was house more attractive, table more artistic, nor were viands more delicious. The bountiful menu was served by younger club daughters and friends, Misses Krentel, Walker, Norma Vedder, Hazel Devine, Reed and Lawrence.

Toasts were responded to by Mrs. Bogue, Mr. Collingwood, Mrs. Myers, Pres. Snyder, Mrs. Holbrook, Mr. R. S. Baker. Miss Gilchrist acted as toastmistress.

Prof. Weil responded very cleverly to an impromptu and Dr. Snyder surprised and pleased the ladies by proposing the toast, "The Women of the M. A. C. Club" which all drank standing. The toasts were full of wisdom and sparkling with wit and proved in every case most effective as mirth producers. Long life to the College Woman's Club.

HORTICULTURAL CLUB.

The Horticultural Club met on Tuesday evening last week instead of Wednesday evening. The Honorable C. J. Monroe, who has recently returned from a five-month's visit in the old world, gave a short talk. He visited Italy, Greece, Egypt, and many other countries. He visited the Agricultural College of Cairo. They own a large farm and very fine buildings. There are about forty students enrolled, and each one is given an acre or so of land to care for and use. The land, a plow and other instruments are furnished to each, also a mule and a cow or ox. They are required to pay for irrigation, fertilization, extra work, etc., and then receive the proceeds of the land. Each student is required to keep an accurate account of all proceedings. The boys are

able to get as high as \$60 for the labor and management, an exceptional amount considering the price of labor in that country, which is only 14 cents per day. Their plows are the primitive wooden ones with steel points. Of their methods Mr. Monroe says, "If they would take up our tools and learn to use them, they would soon revolutionize agriculture in that country."

Apples are very scarce there, in fact most of them are imported. Mr. Monroe said he paid as high as fifteen cents for a single medium quality apple.

Mr. Monroe promised to give a more lengthy talk some time in the near future.

There was a good attendance at the meeting, and all enjoyed the address as well as the Japan Loquats sent to the club by Ralph Stephens, of California.

HERE'S TO THE M. A. C. CHORUS!

On Thursday evening the M. A. C. chorus, Miss Louise Freyhofer, director, presented Haydn's Oratorio, "The Creation," to a large, interested and appreciative audience. In undertaking this work the chorus found itself confronted by artistic and financial difficulties, but before the evening was over both problems were solved satisfactorily. Certainly the organization deserves great credit for affording such an opportunity, which comes but too rarely to Lansing and College people.

Since last fall all the energies of the chorus have been devoted to a preparation of this work, and their selection of competent soloists was most fortunate.

Mrs. Rachel Frease Green possesses a lyric soprano voice of more than ordinary compass. Her high notes were not only clear and pure, but were taken with the greatest ease. In the delivery of her first recitative were brought out the distinctness of her enunciation, the ability to carry vowels without any change of tone quality and her devout interpretation of the part without affectation.

Mr. Walter C. Howell's rendering of the part of Raphael was certainly gratifying. His profound bass voice, of even quality throughout the whole register and of the smoothest texture, permitted him to present the facts of the theme most impressively and with dramatic force. The applause which followed his rendering of the recitative, "And God said, Let the Earth Bring Forth," was spontaneous and genuine.

Mr. Edwin H. Douglass, who assumed the part of Uriel, sang with taste and gave much pleasure by his refined and artistic interpretation of the part. His tones were even and well produced, his reading intelligent, musical and free from exaggeration, moreover, his singing gave evidence of thorough study and comprehension.

The accompanist of the evening, Mr. Samuel Schroetter, deserves especial mention, inasmuch as he performed a difficult and trying part and performed it well. The accompanist has it in his power, always, to mar the performance but Mr. Schroetter, on the contrary, added to it. Miss Mack ably assisted Mr. Schroetter at the second piano during the choruses.

But after all is said, the one deserving of most credit and most

praise is the director, Miss Freyhofer, on whom has rested all the responsibility and who has been able to keep together, for the past eight months, a chorus of seventy-five comparatively untrained voices,—a task by no means easy.

The good accomplished to the students themselves who have practiced an oratorio like Haydn's Creation during the college year is of almost inestimable value.

Undoubtedly the audience on Thursday evening did not express the appreciation which it felt. So let us, through our college paper, extend congratulations and encouragement to her who brought it all about.

M. M.

CONCERT.

The concert given Thursday afternoon was full of good things for the lover of music, and the audience showed its appreciation by the generous applause given to each performer.

Mr. Schroetter, who has just returned from several years' study in Berlin, was a general favorite. His rendition of the Chopin Scherzo, Op. 39, was especially fine, and all his numbers showed genuine feeling and the skill of the artist.

The singing of Mr. Douglass, the tenor, was thoroughly appreciated. The air *Spirito Gentil* by Donizetti gave opportunity to show the flexibility of his voice under perfect control and the DeKoven number, *Poppies*, was so much enjoyed as to call out an encore.

Mr. Howell possesses a remarkable range and handles his voice with artistic skill. His first number, *Honor and Arms* from Handel's *Samson* is an old favorite and at once put the singer in control of his hearers. Fligier's *Horn* also proved to be very taking and Mr. Howell responded to the hearty applause by an encore. The duets were beautifully rendered especially Rubinstein's *Wanderer's Night Song* and Mendelsohn's *I Would That My Love*.

Mrs. C. E. Marshall was the accompanist for the afternoon. College audiences are always glad to see and hear Mrs. Marshall, and her rarely sympathetic accompaniments added greatly to the pleasure of the occasion.

M. G.

With '07.

Geo. Pardee is working a 260-acre farm near Three Oaks. He expects to build a large barn this summer.

STANDING OF TEAMS.

	Won	Lost	Per cent.
M. A. C. ....	3	0	1.000
Hillsdale, ....	3	1	.750
Albion, ....	2	1	.666
Kazoo, ....	1	3	.250
Olivet, ....	1	3	.250
Alma, ....	0	2	.000

Last Saturday Albion defeated Kalamazoo at Kalamazoo 12 to 3 and Hillsdale defeated Alma at Alma 7 to 1. This puts Kalamazoo out of the race and leaves the finals to M. A. C., Hillsdale and Albion.

'95.

M. G. Kains is responsible for the following perversions which recently appeared in the *Continental Mining News*, of which G. C. Van Alstyne, with '96, is editor and manager:

A dollar in time saves nine—if the price goes up.

All is not gold that glitters—good engraving doesn't indicate the property's worth.

It's a long vein that knows no turning.

Patience is a virtue—if your investment is in a prospect.

Money makes the mine go.

The proof of the property is the dividend check.

A dividend in the hand is worth two in the prospectus.

Giant powder and fulminating caps wait for no man.

There is no fool like an old fool who says there is no money in mining.

Not to know mines does not argue mines unknown.

Mines of a geological feather flock in the same camp together.

He who invests and lays away will invest again some other day.

The early buyer catches the returns—when there are any returns.

Speech is silver, silence is golden and dividends constitute sublime oratory.

The end justifies the means—when the vein is good at the tunnel's end.

Uneasy lies the head that wears a crown, if the title to the property is not clear.

Tall earnings from little shipments grow.

Assays are only ink deep.

The ore is never mined with the powder that has burned.

He laughs best who laughs last—provided the mine wins.

Necessity is the mother of fake prospectuses—the promoter needs the money.

Suavity covers a multitude of "skins."

It is better to have mined and lost than never to have mined at all.

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## ABOUT THE CAMPUS.

Prof. Weil suffered from a severe cold for several days last week.

Mrs. Pettit has been confined to the house for several days with an attack of the grip.

The visiting musicians were entertained at supper Wednesday evening at the Woman's Building.

W. P. Robinson lost his Tau Beta Pi watch charm last Saturday. Finder please return it to owner.

Dr. Marshall has organized a class in advanced dietetics. It has been organized upon special request.

Mrs. L. S. Towne and son, L. C. Towne, are at the college for a few days visiting E. A. Towne and friends.

Mrs. C. D. Smith has been worse the last few days. The wet, cold weather has affected her health rather seriously.

Miss Minnie Newman and Mr. H. C. Newman, with '98, spent Sunday visiting at their brother's, Chace Newman's.

The all-freshman played a 4-inning game with the Olivet high school last Saturday and lost the game 4 to 3. A full game would have related a different story.

Prof. Shaw left for Chicago last week to sell the lambs and steers, a carload of each, used in experimental work last winter.

Ten seniors are studying nitrification and denitrification of soils and two are doing hygienic work. The young women are just finishing

problems in bread making from the standpoint of bacteriology. The bacteriological analysis of water will be the next subject.

The department of agronomy has received numerous requests for seed corn. Some 25 bushels have been sold and the supply is gone.

Instructor Tower left for his home on Saturday. He has been somewhat indisposed for several weeks on account of a severe cold.

Instructor Curtis has found that Rowland's concave grating, mention of which was made in last week's issue, contains 20,000 lines to the inch.

Mr. Michels was in Chesterfield recently giving plans and directions as to the installation of septic tanks for the local creamery. This is one of the largest creameries in the state.

W. S. Leonard attended the meeting of the Detroit Engineering Society on Friday in the interests of the mechanical department. The discussion before the meeting was the recent development in machine tools.

A bed of rhododendrons is being put in near the spruces across the driveway from the Women's Building. Some 200 plants were secured from North Carolina. About 40 loads of soil were drawn away and leaf mold put in.

Senator J. B. Dolliver, of Iowa, lectured at M. A. C. last Friday evening on "The American Nation." The address was well attended and

was enjoyed by all. Senator Dolliver is an eloquent speaker and gives excellent ideas regarding America and its opportunities.

The Sororian Society gave their spring term eleven o'clock party last Saturday night. The rooms were very tastefully decorated in red and white and the hall with oriental screens and rugs. Miss Avery and Mrs. Landon acted as chaperons.

The State Board held a regular meeting last Tuesday. The business transacted was largely of a routine nature. The question of employees and salaries was gone over. The present force was retained and some salaries were increased.

A Waterman fountain pen was lost between the Library and Williams Hall last week Tuesday. The letter H was cut on the holder with a knife. Finder will confer a great favor by returning it to Room 43.

The horticultural department has received bound volumes of the different state and United States bulletins from 1888 to the present time. There are 120 volumes in all, a very valuable collection. The bulletins were donated to the department by Prof. U. P. Hedrick.

A great many guests from outside have been entertained at the Woman's Building the past week. The concert was the attraction. Mr. and Mrs. Jackson, Mrs. Bellaire, Mrs. Douglass, Mrs. Pennock, Mrs. Hume, Mrs. Peters, Mrs. Keating, Mr. Alden, Miss Norma Searing,

who is attending Temple College, Philadelphia, Miss Bemis and friends of other students too numerous to mention were here.

A special meeting of the Women's Club was called on Monday, May 16. After the transaction of business the club was delightfully entertained by Dr. Beal in a tour of the botanic garden. It was an opportunity which all enjoyed. Many former plant acquaintances were renewed and many new ones were made and the club is indebted to Dr. Beal for this day with nature.

B. O. Longyear, botanist of the experiment station, has issued a bulletin on Fungus Diseases of Fruit in Michigan. The most common diseases are described in a very simple, comprehensive way. Each disease is followed by an article on prevention and treatment. The last six pages are devoted to spraying and spray materials. The preparation of fungicides and the time of application are especially emphasized. The bulletin contains 42 illustrations, over 35 of which are original. The feature of the publication is the clearness, exactness and suggestiveness of the drawings. Mr. Longyear is an artist in this line and the bulletin shows his skill to a remarkable degree. He has issued another bulletin on Seed Testing for Farmers, in which purity and vitality are considered. Page 10 is devoted to illustrations of red clover, alsike clover, crimson clover, alfalfa and some 20 weed seeds including the different kinds of plantains, chess, corn, cockle, ragweed, etc.



**PLOWING BY STEAM IN MICHIGAN.**

Necessity is the mother of invention. A Michigan farmer had four hundred acres of land to plow and not enough teams to do the work. Something had to be done. It had been a dream for more than one year on the part of this farmer that some use ought to be made of traction engines in such work as plowing and when this necessity came upon him he undertook to make his dream a reality.

The farmer was A. M. Welch, his farm three and a half miles Northeast of Ionia in Central Michigan, the engine a Reeves Cross-Compound, manufactured at Columbus, Ind., the plows two two-bottom Cassaday. Mr. Welch is one of the most energetic farmers in Michigan, a man who owns four hundred eighty acres of fertile land in Ionia county, who feeds from 1,500 to 2,000 lambs each winter. This winter he has added to his lambs 50 head of grade Hereford steers, 30 of which are now finished and ready for shipment as soon as the market is in shape to warrant. Twenty others are fattening nicely.

The farm is expected to provide the roughage for the winter feeding of large herds and flocks. There must, therefore be a large acreage of corn annually with plenty of clover hay. The winter has been very hard upon clover, and most of the fields will have to be plowed this spring and reseeded. Mr. Welch grows no wheat and has universally good success in seeding after oats and barley, especially after barley, which he is inclined to grow in place of oats as feed for horses and other live stock alike, his rotation being corn, barley or oats, clover. Following such a rotation involves a large amount of plowing early in the spring. With his horse power largely in the shape of mares bearing colts it was impossible, in such a year as this with the spring delayed, to do the necessary plowing by horses.

In the neighborhood were several traction engines standing idle. Mr. Welch, therefore, bought a couple of two-gang Cassaday plows, sixteen inch furrow, hired a traction engine of his neighbor, Mr. Stone, and by an arrangement involving a little ingenuity, hitched the engine to the plows in such a position that the man who steered the engine simply kept the edge of the big driver sixteen inches from the furrow. Behind the plow came a heavy steel roller, weighing approximately 110 pounds to the running foot and behind the roller a weighted Hallock weeder. The field was 110 rods long, four rods were cut off from each end by a single furrow of a two-horse plow, leaving room on which the outfit could turn after completing one furrow and before beginning the return journey. The field was not level, although the hills were not particularly steep, to demonstrate the practicability of the scheme in a rolling country. The plowing was done on a timothy sod, the depth eight inches. Part of the field was covered with a heavy coat of manure, in which a large amount of bedding was mixed, clogging the plows badly and compelling the abandonment of the jointers.

The engine was not provided with sufficient storage capacity for either fuel or water to last more than one bout without refilling. This neces-

sitated the waste of some considerable time at one end, a waste which would have been avoided had the engine had larger capacity. The engine was a thirteen horse power when running with both cylinders and twenty horse power when one cylinder alone was used. It was run as a compound engine except at starting.

Four furrows were cut nominally sixteen inches wide each but in reality measurements showed that at each trip the plows covered sixty-six inches instead of sixty-four, one and a half bouts therefore plowed a rod wide. The average time actually occupied in going the bout, approximately two hundred rods, really slightly over this distance, was sixteen minutes. The average time per bout, including the filling of the water tanks and coaling up, was twenty-four minutes. Remember that for each bout and a half, a rod wide was plowed, rolled and harrowed, leaving the surface smooth and level but covered with a good earth mulch.

This outfit had plowed thirty-one acres in three days at a cost of \$33, including the actual expense of the engine, the wages of the men, the cost of the fuel and oil and all other items involved in doing the work.

The engine seemed to do the work without strain and moved at an average rate of two miles an hour. A faster rate threw the furrows too far and was impracticable. No trouble was experienced with soft spots because the engine would go over, without trouble, any ground that was fit to plow. It was noted that some of the larger farmers living near Mr. Welch were adopting this plan, and were preparing to start a similar outfit within the next few days.

C. D. SMITH.

With 'oo.

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