# THE BULLETIN

*of the*

# UNITED STATES GOLF ASSOCIATION GREEN SECTION

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## *Contents*





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## Annual Meeting of the United States Golf Association Green Section

The annual meeting of the United States Golf Association Green Section was held at the Hotel Commodore, New York City, January 4 and 5, 1929. As in previous years the meeting included three sessions, two on Friday, the 4th, and one on Saturday morning. Mr. Findlay S. Douglas, newly elected president of the United States Golf Association, presided at each session.

The program was opened Friday morning with the annual report of the Research Committee of the Green Section presented by the acting chairman, Mr. H. L. Westover. This was followed by a discussion of past and present greenkeeping problems from the viewpoints of the greenkeeper, the chairman of the green committee, and the professional. The discussion was opened by Mr. John Morley, president of the National Association of Greenkeepers of America, with a review of the developments in greenkeeping in recent years. Mr. R. F. Arnott, chairman of the green committee of the Upper Montclair Country Club and chairman of the New Jersey State Golf Association Green Section, followed with a presentation of his views on how the chairman might contribute to the improvement of turf on his course. Mr. J. B. Mackie, treasurer of the Professional Golfers' Association of America, then discussed the recent developments in golf courses from the viewpoint of the professional. After this interesting discussion Mr. J. W. Bryant, Jr., told of the work the member clubs of the Detroit District Golf Association were doing in the standardization and analysis of maintenance costs in that district.

The afternoon session on Friday was devoted to reports on the work of the Green Section. The first three discussions dealt chiefly with the new developments in the establishment of experiment stations and demonstration plots throughout the country. These were followed by a presentation of the extension phase of the Green Section work. The last two papers reported some recent results of the Green Section experimental work.

The first part of the Saturday morning session was devoted to a consideration of the organization of the Green Section's work. Mr. W. D. Vanderpool outlined the plan and purpose of the Green Section's organization, and Mr. H. P. Kidd spoke briefly on the newly formed Metropolitan District Green Section, showing how it was coordinated with the national organization. Dr. G. P. McRostie then spoke of the golf turf work being done in Canada. The closing paper on the program was an extremely interesting discussion of soils in relation to golf course turf by Dr. J. G. Lipman.

The material given in a number of the papers presented at the meeting appears as articles in the current number of the Bulletin.

Others will follow in the March number. Those who were unable to attend the meeting may thus have opportunity of becoming acquainted with the reports and discussions given in New York.

The program follows:

JANUARY 4, 10 A. M.

Opening remarks.....CHAIRMAN FINDLAY S. DOUGLAS
Annual report of the acting chairman of the United States Golf Association Green Section Research Committee .....H. L. WESTOVER
Greenkeeping yesterday and today.....JOHN MORLEY
Old and new turf problems as viewed by a green committee chairman .....R. F. ARNOTT
A professional's view of turf problems.....JOHN B. MACKIE
Green cost analysis.....J. W. BRYANT, JR.

JANUARY 4, 2 P. M.

The Green Section experimental work.....JOHN MONTEITH, JR.
The new experimental turf garden in Chicago.....C. A. TREGILLUS
The new Green Section demonstration plots as an aid to the greenkeeper.....F. H. WILSON
Green Section extension work.....KENNETH WELTON
Some recent work at the Arlington Turf Garden.JOHN MONTEITH, JR.
New phases of turf disease work.....A. S. DAHL

JANUARY 5, 9 A. M.

The organization of the Green Section.....WYNANT D. VANDERPOOL
The Metropolitan District Green Section.....HARRY P. KIDD
Improvement of golf turf in Canada.....G. P. MCROSTIE
Soils in relation to golf course turf.....J. G. LIPMAN

## Annual Report of the Acting Chairman of the United States Golf Association Green Section Research Committee for 1928

By H. L. Westover

On November 30, 1928, the Green Section completed its eighth year of service—six years (1921-1926) as a separate organization, and two years (1927-1928) as the instrument of the Green Section Committee of the United States Golf Association. In spite of numerous handicaps it is believed that the year as a whole can be regarded as one of progress and accomplishment.

During the entire existence of the Green Section there has never before been a season when conditions were so trying for turf grasses. The hot, humid weather was especially favorable for the development of various diseases, and much excellent turf was seriously damaged in spite of control measures. However, these unusual conditions offered an excellent opportunity for experimentation, and it is believed that the information gained will be very helpful in meeting such emergencies in the future. Considerable progress can be reported in further control of some of the destructive turf grass dis-

eases, such as brown-patch and snow-mold, and in the control of insects, especially the Japanese beetle and the June beetle, and earthworms.

It is a pleasure to report that our chairman, Dr. Oakley, whom most of you remember as being deeply interested in the work of the Green Section since its inception, is much improved in health. He expects to return to Washington in the early spring and will then actively resume his place as chairman of the Research Committee of the United States Golf Association Green Section.

That the work of the Green Section is becoming more generally recognized is evidenced by the requests that we have had for starting experiments in cooperation with various State institutions, and by the large number of letters we have received from various sources for information on turf grass problems.

The United States Golf Association clubs receiving Green Section service totaled 1,056 on November 30, 1928, as compared with 1,012 clubs on the same date last year, representing a gain of 44 clubs. It was largely through the efforts of the Washington office that 29 of these new clubs joined the United States Golf Association.

In spite of unforeseen expenses, the Green Section has operated within its budget. The total appropriation for the current year was $28,000, of which $7,100 represents contributions to experiment stations for cooperative investigations. The total expenditures were approximately $27,047.85, leaving an unexpended balance of approximately $952.15.

The cost of printing the Bulletin exceeded our estimate by a considerable amount, due to the fact that beginning with the May issue 1,500 more copies have been printed each month than heretofore. This increase was considered advisable inasmuch as most numbers of the Bulletin since that date have been devoted largely to one subject. It is felt that bulletins of this nature can be used to advantage in answering questions and will therefore be in demand for some time to come. Our costs for supplies have been greater than expected, due primarily to the necessity for furnishing seed and fertilizers for several demonstration plots that have been established on golf courses and which were not contemplated at the time the budget was prepared. Certain funds in the budget were, however, not required for the purposes indicated and we were able to draw on these in cases where the expense exceeded the estimate. The budget provided $1,200 for work in California, but only $241.12 of this amount was expended, due to the fact that we were unable to complete plans for starting these experiments until fall.

The Green Section at Washington has collected and forwarded to the New York office $3,533.26, which represents income from such items as service to daily-fee courses and foreign clubs, individual Bulletin subscriptions, sales of back numbers of the Bulletin and binders, and refunds of travel expenses.

A detailed financial statement for the year ending November 30, 1928, has been published in the report of the Executive Committee of the United States Golf Association Green Section.

The complete mailing list of the Bulletin totaled 3,120 on November 30, 1928. This included 1,056 clubs that are members of the United States Golf Association, 23 privately owned daily-fee courses, 22 municipal courses receiving the Bulletin without charge, 26 foreign clubs, 29 individual subscribers residing in foreign countries,

387 individual subscribers residing in the United States, 3 Canadian clubs, 160 Canadian subscribers receiving the Bulletin through special arrangements with the Royal Canadian Golf Association, and 337 complimentary copies. For the year ending November 30, 1927, the mailing list totaled 3,250, indicating a decrease of 130 in circulation for the year ending November 30, 1928. The decline in the mailing list is due largely to the fact that during 1927 we carried 177 former Green Section member clubs which had never been active or allied United States Golf Association clubs. Omitting these clubs there was an actual increase of 88 in the mailing list. The purpose in carrying these clubs was to give them ample opportunity to join the United States Golf Association and receive the Bulletin and Green Section service. When they did not signify their intention of becoming members of the United States Golf Association they were dropped from the mailing list beginning January 1, 1928. Since that time a number of these clubs have joined the United States Golf Association.

There has been an appreciable increase in the number of clubs that receive the Bulletin through affiliation with the United States Golf Association, and there has also been some increase in the total number of paid subscribers. In 1927 there were 29 Canadian clubs receiving the Bulletin and Green Section service as compared with 3 at present. This decrease is due to the fact that through arrangements made with the Royal Canadian Golf Association we now supply that organization with 160 copies of the Bulletin each month for their member clubs, without Green Section service. The three clubs still receiving the Bulletin and service at the former rate are not members of the Royal Canadian Golf Association.

The experimental plots established in cooperation with State experiment stations at Manhattan, Kans.; Lincoln, Nebr.; New Brunswick, N. J.; and Gainesville, Fla., have been carried on with some additions and continue to be a source of interest and to furnish much valuable information on turf maintenance for clubs in their respective districts. The plots established several years ago in cooperation with the University of Minnesota will likely be discontinued in 1929, as the demonstration plots recently established at the Interlachen Country Club will serve to demonstrate the more important phases of turf grass maintenance to clubs in that district.

New experimental plots have been established in cooperation with Stanford University, at Palo Alto, Calif.; Massachusetts Agricultural College, at Amherst, Mass., and on the Mill Road Farm Golf Course, near Chicago, Ill. The plantings at Palo Alto, the first made by the United States Golf Association Green Section in the Far West, should be of much assistance in determining the best practices in turf grass maintenance for that part of the country, especially for California conditions.

Quite comprehensive experiments are planned for the new experiment station at Chicago, which, through the generosity of Mr. Lasker, is located on his private property. The results from these tests should be applicable to a large number of courses and are the first designed to furnish information on turf grass maintenance especially applicable to the local conditions.

In addition to the experimental plots named above, demonstration plots were established the past season on 15 golf courses.

The second annual greenkepeers' convention sponsored by the United States Golf Association was held at the Country Club of Atlantic City on the 4th of June and continued at Pine Valley Golf Club on the 5th, after which several of those in attendance at these meetings came to Washington to study the turf experiments at Arlington Farm. While the number present was smaller than the previous year, there was much interest in the work carried on at the various points visited. The greenkeepers were invited to play golf at both these clubs, and prizes were awarded at the Country Club of Atlantic City. An evening meeting was held at this club, during which many topics of interest were discussed. The United States Golf Association Green Section is much indebted to both of these clubs for the courtesies extended, and especially to Mr. H. Kendall Read, of the Country Club of Atlantic City, and Mr. Norman Mattice, of the Pine Valley Golf Club, for their personal efforts to make these meetings a success.

To those of us who have followed the turf grass experiments closely it becomes more and more apparent that there are many problems, such as drainage, soil texture, and proper construction of the greens, that are much more closely associated with the development of a satisfactory putting surface than was formerly believed. The problems are so numerous that we can not hope to solve them in one year nor in five years. Scientists have been working for years on farm crop problems and are still finding an abundance of investigational work. Why then should we become impatient in the solution of turf problems? Still with the loyal support of the United States Golf Association, such as we have had in the past, and with the assistance of the greenkeepers, green committee chairmen, and others interested in golf, these problems will gradually be solved.

## Greenkeeping Yesterday and Today

**By John Morley**

About fifteen years ago there were scattered throughout the United States a few hundred golf courses. The word "greenkeeper" was not generally known. About 70 per cent of the courses were under the direct supervision of professionals, most of whom had received their training in the British Isles. In most cases the methods to which they had been accustomed proved very unsuccessful owing to the climate and soils of the United States being different from those of their native land. They were to a large extent handicapped because very little knowledge was to be obtained, even from Washington, on the best methods to pursue. Not more than 10 per cent of these professionals would have qualified as the greenkeeper of today.

In those early days, although we were fortunate in being able to import good grass seed from foreign countries for use on our golf courses we were lacking in knowledge of the proper care of turf. It is true that we had our turf experts. One of the leading experts was the late Fred W. Taylor, of Philadelphia, who claimed to have discovered that by mixing clay, bone meal, and cow manure in a cement mixer and using the mixture in layer formation in the construction of a putting green, the problem of raising ideal turf was solved. This method we all know proved to be a failure.

In those early days also there were very few pieces of equipment suitable for keeping a course in excellent condition. We first had to cut our fairways with the one-horse mower. Then came the gasoline mower, which weighed nearly a ton, with a single cutting unit. If on an 18-hole course we wanted to cut the fairways once in 9 days we were compelled to use two mowers, for one or the other was out of commission most of the time. Then came the sulky mower with three cutting units, drawn by a horse which had to wear iron or aluminum shoes. If the turf was soft and the horses were not flat-footed they would dig the toes of their shoes into the turf and leave the fairways full of small holes.

About twelve years ago, golf in the United States began to make rapid strides, and with this progress came improvements; but new courses multiplied so fast that it was impossible to secure enough men well versed in the art of greenkeeping. To a large extent we were very fortunate in securing men who had at one time been well versed in farming and gardening. But it was soon discovered that the methods used in farming and gardening were not successful with turf on golf courses. Each in his own way endeavored to find other methods, and with so many working along different lines we gradually commenced to get information that tended to produce better turf and better working equipment.

Since the World War golf courses have sprung up by leaps and bounds, and from a few hundred 15 years ago they now number over 4,000. Out of the vast number of men selected to take charge of these courses we have been able to produce a large number of successful men who are today well versed in greenkeeping. In the past few years greenkeeping has been placed in the position in which it properly belongs. While 15 years ago 75 per cent of the golf courses were taken care of by professionals, today over 80 per cent are in charge of greenkeepers.

It requires from three to five years to produce turf that will stand the wear and tear of the players, and to a certain extent it also requires the same amount of time for a pupil to acquire sufficient knowledge to make him rightfully known as a greenkeeper. Officials of new courses should take this into consideration. It also happens during the early existence of a course that conditions are such as often to breed dissatisfaction among the members. No matter how hard the chairman of the green committee and the person who has charge of the course may strive to correct conditions, they may still fail to obtain results owing to the fact that the soils specially used in the making of putting greens were selected and developed by some of our golf architects for the growing of bluegrass and clover instead of the various strains of bent grass. I am of the opinion that the time is not far distant when the officials of a proposed new course who decide to hire a golf architect will at the same time hire an experienced greenkeeper, who will be under the supervision of the officials during the building of the course and divorced entirely from the architect.

I have always been at a loss to understand why, when a new club has been organized and has selected a site, often consisting of 150 to 200 acres of land generally embracing two or more farms, one farm having been kept in the pink of condition and the others completely run down, instead of giving the poor land more fertilizer and seed after the course has been constructed and is ready for fertilizing

and seeding, and giving the good land less in proportion, they usually give both the same quantity.

The greenkeeper of yesterday had a more peaceful mind, although he lacked the knowledge and experience which greenkeepers possess today. When he retired for the night his sleep was usually quiet and refreshing. The greenkeeper of today, especially during the playing season, knows no rest or contentment. When he gets up in the morning and goes forth to take up his daily tasks on the course, he never knows what Nature has in store for him. We know that if we are kind to Nature she will endeavor to repay us for that kindness. But unintentionally we have tried to force her to give us more than she could produce; and by so doing we have brought about diseases of turf which we are unable to control. A few of the leading greenkeepers of today are commencing to dig into the mysteries of Mother Earth.

The season of 1928 was one of the worst I have witnessed as regards turf diseases. I am, however, of the opinion that the results achieved during the past season will be a blessing in disguise. I believe that in the season of 1929 we shall make rapid progress in knowing what is right and what is wrong in our efforts to lessen or eliminate these obnoxious diseases. Not all of the large browned patches that appear on our putting greens during periods of excessive heat and humid atmosphere are caused by parasites.

In recent years practices in golf course maintenance have been changed considerably. The putting green mowers formerly did not cut the grasses as close as they do today. We used to cut the putting greens every other day; now we are often compelled to cut them twice a day. The old-style mowers left ridges in the turf. We used to roll the greens every day with a heavy iron roller. Next we used long wooden rollers. With the improved mowing machines of today most greenkeepers do not need to use a roller except in early spring. When we allowed the grass to grow long in former days and kept the blades of the grass down by rolling, we did not have so much disease, if any, on our putting greens. Yesterday golf courses did not have water systems equal to ours today. During a hot, dry spell, the putting greens often turned brown for lack of water. We formerly used the old-fashioned sprinklers, watering six or seven putting greens each night. Today, with our high-pressure pumps, a large number of courses are watering their putting greens every morning before cutting the grass.

In the early days of greenkeeping chemical fertilizers were rarely used on golf courses. We were using cottonseed meal, bone meal, sheep manure, some nitrate of soda, and a few other fertilizers. We believed it was necessary to have alkaline soils, especially for putting greens. We did not as a rule have the fine grasses which we have today, although we were able to obtain seed of the finest of the bent grasses. Nearly every time we top-dressed our putting greens, which was done mostly with humus that we had to buy, we gave each putting green about 15 pounds of grass seed. With a few exceptions most putting greens were a mixture of creeping bent, fescue, rough-stalked bluegrass (*Poa trivialis*), annual bluegrass (*Poa annua*), and often lots of clover. Today the condition of our soil for putting greens is reversed; instead of being alkaline it is made slightly acid by the application of certain chemical fertilizers. There is an honest difference of opinion among greenkeepers and others as to whether

we are justified in using acid fertilizers. While I did not discover the value of sulphate of ammonia as a fertilizer for putting greens, which produces an acid condition in the soil, it having been previously used in England and America but practically discarded, in the early history of the Green Section I advocated acid soils for the bent and fescue grasses. I have probably used sulphate of ammonia more than any other greenkeeper in this country, and I have never found any reason for discontinuing its use. When I had nine putting greens on various parts of the course of the Youngstown Country Club analyzed by a competent chemist, he reported that four were sub-acid, three minimum acid, and two neutral. This demonstrates that by the continued use of sulphate of ammonia you can not make soil such as I have on my course too acid. There are some who believe that sulphate of ammonia is the cause of brown-patch and other diseases which affect turf. Before we were using sulphate of ammonia we had brown-patch. For instance, I may refer to the condition of the greens on Columbia Country Club, at Washington, D. C., at the time of the National Open Championship several years ago. They were not using this fertilizer there at that time. One of the greatest dangers that may attend its use is that at times we may use too much of it, thereby excessively forcing the growth of grass and making it too tender. During brown-patch weather we should apply only enough nitrogen to keep the grass healthy and alive.

Yesterday chemicals on a golf course were in very limited use; today, with the big array of chemicals being advertised as fertilizers, fungicides, insecticides, or what not, the greenkeeper must have some technical information, or a source from which he can obtain such information, unless he is to become a victim of the salesman with the best line of talk. This is exactly the situation which is found in comparing modern farming with farming of some years ago. Years ago the more progressive farmers learned that they could not become expert in all features of crop production—expert chemists, expert disease men, expert mechanics—all in a lifetime. They have therefore demanded help from the Federal Government and the state governments in providing the highly specialized information which they themselves have not time to gather. There are various farmers' organizations which have served to bring together technical and practical details and to prove mutually helpful in other respects.

Greenkeeping, as I see it, is now reaching the point which farmers were forced to reach several years ago. In other words, I think you will readily agree with me that the demands of the golfers have become more exacting and the problems of greenkeeping have increased tremendously during the past few years. This calls for better trained greenkeepers and for men who are willing to keep abreast of developments. The day of the greenkeeper with an unwillingness to learn from or to help others is fast coming to a close. Greenkeepers have been too modest all along, and for that reason golfers have blamed them for everything from an incurable slice to a lost ball. If the greens are in good condition the player is happy. If the greens are not kept in good condition the player loses his temper and goes home cross and his affairs suffer.

I am inclined to believe that with so many new courses being constructed with the intention of further progress, the greenkeeper who is aiming to give the service that will be demanded will be compelled to be well versed in botany and plant pathology. While we all real-

ize that the best education he may get is from practical experience, yet I am of the opinion that knowledge along theoretical lines is helpful.

## Old and New Turf Problems As Viewed By a Green Committee Chairman

By R. F. Arnott

Exactly how much a green committee chairman should know about turf is perhaps a question. It might very well be that the less he knows, the better. When he first starts in as a green committee chairman, he is very deeply interested in everything he sees. He has had his game of golf, he has learned to play a little, and he feels he can perhaps do a little to help his club by spending his time with his greenkeeper. So he goes on the first year, the second year, and the third year, getting more and more interested all the time. He buys a number of books and spends his days and time on them, gets up at 4 o'clock in the morning to study fungi, and helps his greenkeeper as much as he can. He finds his game is gradually falling away as he is getting more and more interested in turf; and after a while he does not know so much about either.

The answer to it all seems to be that the position of the chairman is not to delve too far into the turf questions, but rather to be a help to his greenkeeper—to be a sort of go-between. Those of you who have done some chemistry will understand what I mean in classifying the chairman as a sort of catalyst. He is there for the purpose of carrying on a reaction between the greenkeeper and his surroundings, his turf and his club, while at the same time there is not much real action required on his part. He will take a real interest in the turf, for the reason that it makes the conditions better for his club and for the members of the club in playing that game which he believes is the best game ever invented. He will for this reason try as far as he can to help his greenkeeper work out his ideas; and in so doing the chairman comes in as the catalyst.

The greenkeeper will get his ideas about the turf and what he shall do for it. He finds himself a little uncertain, perhaps confused at times, as to just what he should do. He can have a talk with his men and he can talk with his green committee chairman. After a little while the green committee chairman in his ignorance asks stupid questions and very likely starts a thought in the greenkeeper's mind which he has no idea of starting. The greenkeeper can make the connection that the chairman was not looking for. It is also a fact that the green committee chairman is able to help his greenkeeper in handling his problems of machinery and in arranging his plans for work. His actual experience and acquaintance with the turf is something which he gets at odd times.

The man who is looking after the grass and the turf itself should be there all the time—should be out on the course early morning and all day and late at night to see just what the grass needs. The turf and the grass are in this respect comparable to a little baby. Its mother can see what it wants just when it wants it and is there to give whatever is needed at the right time. The doctor is the man whom she wants to see when there is something wrong. In the old days of humanity there were not many doctors, and mothers got along

as well as they could. After a while men began to take interest in the science of medicine and to study the causes of and the cures for disease. The same thing has developed in the study of turf. A great deal depends on the help we get from nature, the same as in the case of the doctor's curing of human ills. However, there is much that the doctor of medicine can do to help nature in maintaining the health of humans, and there is much that a doctor of science can do to help the greenkeeper. The scientist does not pretend to know how to grow turf as well as the greenkeeper does, and he does not pretend to be able to produce a golf course, but he can help the greenkeeper when he is in trouble.

Another responsibility of the green committee chairman is the consideration of the interests of his club members. Mr. Morley has spoken of the greenkeeper's getting blamed for everything the player does. It is true the golfer will complain; but he has a right to complain. He is a member of his club for the purpose of getting recreation and relaxation from business, and for that reason he deserves every consideration and should be provided with every means whereby he can get his relaxation. The requirements of turf have become more and more exacting from the player's standpoint. The modern golfer has become more critical of the greens and of the grass on the greens, and will perhaps often rightly blame the condition of a green for his failure to hole a putt. This is no doubt his right. The greenkeeper can do all he may and yet sometimes the turf is not in condition for the player. The answer to this is that the utmost effort should be made by the greenkeeper to develop turf to a degree of perfection which was not called for in the old days but which is now demanded by the expert player. Players are becoming more expert every day. These young men growing up now are playing golf practically every day from the time they start at the age of about 14, and they are becoming more and more expert at the game. Therefore it is the duty of the green committee chairmen and the greenkeepers to try to make the conditions of turf the best possible for those men to produce the best game that is in them.

The experiments which are being made by the United States Golf Association at Arlington have helped immensely in the important study of turf. The Green Section is, I understand, now preparing plots where one can see the different grasses and make his own selection from a fairly full-sized green. It is possible to putt on these grasses and try them out. This is a step in the right direction, for thus the members of clubs, green committee chairmen, greenkeepers, and others can look over the collection and make their own choices as to what they prefer as a turf texture and a grass for them to use on their own courses.

There is no doubt that there is room yet for much work to be done, and it is for that reason the Green Section is inviting the interest of all the clubs and the golfers in the country. The more the clubs have learned about this subject the more interested they have become. I believe it is continuing now to be a matter of interest for more greenkeepers than ever. They are able to see now, and will see more clearly as time goes on, that the work is being done to help them and that it will be a help to them. It is not intended to eliminate any greenkeeper or to reduce greenkeeping to a science. That can never be done any more than the doctors can take care of the babies in a hospital.

# A Professional's View of Turf Problems

By John B. Mackie

Before attempting to present to you a professional's view of turf problems I should like to give you a professional's view of the professional, of the game of golf, and of golf course construction.

If some one were to ask me when and where the first golf professional came into being, I am afraid I should have to answer him like Topsy in "Uncle Tom's Cabin"—He wasn't born; he just grew. But if his name is unknown, his faults unwhispered, or his praise unsung, it is because his "origin," like that of the game itself, is shrouded and obscured in the mists of a long-distant past. And if, from that far-off time, down through the passing years and under every changing condition, the game still holds those charms which have endeared it to so many and still retains the traditional traits of honesty and sportsmanship which are so essential to the playing of it, it is because golf professionals in many lands and in every clime have preached and practiced those undying fundamental principles, to the extent that the professional is now everywhere recognized not only as the game's traditional partner but as its inseparable companion as well.

In the advancement of the game in this country, the professional can look back with a feeling of pardonable pride on the long string of victories that American golf has won in the past few years; yet he is ever conscious of the facts that while building he builded well and that the seed which he sowed has fallen in fertile soil.

When the pioneer Pro. came to this country about forty years ago, he not only found himself in a new land, but in so far as the inhabitants were concerned he had to teach them a new game. Golf was unknown, golf clubs unheard of, and golf courses had to be built; and if those that were constructed at that time seemed crude and unscientific when compared with the standards of today, they had one advantage in that they cost little to build, and the quality and manner of their upkeep proved no untoward hazard to the nation of beginners who had just started in to play the game. This was the "beginning," the day of the gutta ball and the time of the cop bunker. Across almost every fairway, somewhere between the tee and the cup ran a high man-made ridge, and beyond lay the putting green, painfully symmetrical, in the shape of a complete circle or a true square.

While the game in America is still comparatively young, yet in the few short years that it had been played prior to 1902 the inventive genius that is supposed to be common to the people of this country got to work, and the result was a "rubber-cored ball," which did much to make the game popular (if not easier), especially for the poorer players and those who were just taking it up. The new ball was faster and longer than the old gutta and considerably larger than the ball of the present day.

The cop bunker at 150 yards, presenting a compulsory carry and now no longer a hazard to be afraid of, was filled in, and a new system of bunkering was inaugurated which had as its purpose the placing of a hazard that would leave with the player a choice of club and direction and at the same time provide a varying risk proportionate to his decision and as a test of his skill.

The liveliness of the new ball, especially on the putting green, showed up the weakness of that all-important part of the links, and

greenkeepers set about to find some method of keeping the putting surface free from worm casts.

Shortly afterwards, a Mr. Rushmore, of Garden City, put on the market a bichloride of mercury solution which proved most effective and which, as you all know, is still a standard method of keeping our putting greens free from worms. This was the beginning of the end of what our Washington friends fondly describe as the "cow-pasture era."

After that we had the lime era; then the mechanical age, the coming of the power machine to the golf course, when tractors took the place of horses and single mowing units gave way to gangs of three to five.

In April of 1917 the Rhode Island State College Experiment Station issued a bulletin showing that soils treated with fertilizers having an acid reaction were better adapted for the growing of the fine turf grasses that are so desirable on the golf course. The experiments had covered a period of years, from 1905 to 1916. This was the beginning of the era of experimentation.

A year or two later the Green Section of the United States Golf Association was formed and took up its work for the improvement of the American golf course.

The driving force back of this project was the late Dr. Piper, and we all miss his presence and genial personality at these annual meetings. Along with Dr. Oakley, he did some wonderful work for the cause of good greenkeeping.

A review of the findings of the Green Section at Washington would seem to indicate that the conclusion arrived at by the Rhode Island station twelve years ago as to the desirability of an acid condition in the soil of a putting green had been closely followed and that their theory was correct. The Green Section recommended sulphate of ammonia as the fertilizer best suited for producing the ideally acid condition, and for a time this fertilizer was looked upon as a sort of a cure-all for the many and varied troubles that fall to the greenkeeper's lot. In the meantime we have had with us the scourge of brown-patch, large, small, and lately all-embracing in so far as the putting greens on some golf courses were concerned. "Where have our greens gone?" was a common query at many of the Metropolitan clubs last year. This condition has brought about a feeling of doubt in the minds of many, and during the past few months there have been unmistakable signs of revolt against and a decided sense of uncertainty as to the advisability of continuing the use of sulphate of ammonia as the chief source of fertilization for the putting green.

Greenkeeping in these latter days is unquestionably an intricate job. We always seem to be nursing a sickly person who is ever in need of care, and when it comes to giving him the necessary medicine we are too apt to be like that type of patient who, finding that a certain medicine seems to help him, proceeds to kill himself by taking overmuch. Such was the case during the lime period, when some golf courses received a coat of whitewash every other week; and to such an end it is now feared the continual striving for an acid condition in the soil of our putting greens is going to lead us. The sections where doubt exists are not isolated cases, and a real effort will be necessary to refute or substantiate the existing belief that all the

ills that have beset the greenkeeper for the past few years can be traced to an overanxiety on his part to follow the acid trend.

To those—and they are many—who have already gone back to the lime kiln for a cure, I would advise them to do so in moderation; if they feel they have traveled too far in one direction, it may not be necessary for them to retrace their steps to the starting point, for somewhere along the road the true path will be found.

To this end, it lies within the reach of every one of us, as it is the duty of every one here, to lend a helping hand. The men at Washington are fine, capable fellows. You will find none of the dogmatism of the theorist in their make-up, and should you wish to approach them with a suggestion or a problem you will get all the help at their disposal and a willing ear for what you have to say.

## Green Cost Analysis

By J. W. Bryant, Jr.

What I shall say concerns cost analysis rather than cost accounting, and I suppose it is appropriate that the subject should be the last thing on this program. With the mounting costs of golf course maintenance this question is overlooked too much.

The Detroit District Golf Association, which I represent, was organized in 1919. We have 38 member clubs, and out of those 38 member clubs, 37 I believe are members of the United States Golf Association. We derive benefits that are numerous from our affiliation with the United States Golf Association, and we would not like to forfeit that affiliation.

The Detroit district has tackled a great many problems in golf club affairs and club management, and I think one of the most interesting subjects has been that of cost analysis in the maintenance and construction of golf courses in our territory. We have dues from our members that amount to $50 a year for clubs within a certain radius, and $25 for clubs beyond that radius up to 50 miles. In our informal discussions of the affairs in the district we find a very wide range in the figures covering the costs of golf course maintenance among the member clubs. We have clubs of 18 holes in these informal meetings making the statement that they are operating at somewhat less than $5,000 a year, and ranging on through 9-hole courses a little above that figure up to $36,000 a year for the 36-hole courses. It began to be more and more a subject for discussion at our little noonday gatherings as to why this great difference in costs.

In talking about it informally, we found that there was a possibility that many clubs were not properly reporting expenses which were chargeable to course maintenance, and other clubs perhaps were charging to course maintenance certain items which perhaps should not be charged. We found, for instance, that some clubs were using water through their house meters, the house carrying the burden of that water cost rather than the green committee. We found that green committees were using pumps to spread their water, and the cost of running these pumps instead of being charged to the green committee was charged to the house committee. We found that some of the men working on the golf course were originally on the payroll under the house committee, and in the course of time their duties had been shifted to outdoor work, and yet the payroll entries had not been

changed to compensate for that shift. We found that the greenkeeper was given board and room and that in the cost entries his room rent and meals were charged to the house rather than the greens work. We found that in some of the larger clubs, where the expenses were running higher, the green committee, for instance, was carrying the burden of the cost of a starter at the first tee who regulated the beginning of play, and was carrying the cost of the ranger on the course, who was keeping the slow foursomes moving, and was carrying the cost of an officer who was patrolling the entire grounds to keep strangers off the property.

In getting back to this green cost analysis, we found that our 38 member clubs paying us about $1,700 a year in dues were spending something more than $600,000, and it was obvious that if we could analyze that $600,000 cost and save our member clubs 10 per cent of it we should be well repaying them with $60,000 return for their $1,700 investment. We first started out on the theory that we should install uniform cost accounting. We called in an outside accountant whom we considered capable, and we paid him well to study the situation and when he got far enough into his work to begin to report back. We saw that it was going to be a hopeless task to try to upset the bookkeeping systems of the 38 member clubs. There were objections among the clubs, as they had their books all arranged and did not want to change them. We therefore backed up on our idea of uniform cost accounting, and decided that we would not concern ourselves with how those clubs kept their books provided they could give us information from the books in such a form that we could analyze it ourselves, and after such analysis would turn the data back to the green chairmen of the member clubs so that they themselves could get from the data what they naturally would want to get in improving their own conditions.

About a year ago I was appointed chairman of a committee to go into the subject, and our committee decided that what we would propose should be a questionnaire to be made up in the best form we could work out and given to the green chairman of each club, asking him to fill it in carefully from the book records of his club and return it to us. We worked for some time on this questionnaire, and finally evolved a form which we considered contained questions which, if properly answered, would give us a basis on which to analyze all conditions and report back to him intelligently. I might add that a reproduction of the form has already appeared in the Bulletin, on pages 102 and 103 of the May, 1928, number. We sent that form out with a page attached, something in the nature of an income tax blank, so that with this sheet the chairman has his questions, and if there is any doubt in his mind about just what is wanted in those questions he has reference to tell him exactly what we do want.

I might say that after that form was made up, or rather since the form was made up, we have found weaknesses in it which we are correcting with the next printing. We are making notes as we go along of changes which we want to make in the form, and I think within the next two months we shall have finished our study and shall be able to send to the press a new form which will give us perhaps a better picture of what we want.

The form is divided generally into two classifications, one covering general information, and the other expenditures. The questions under

general information are numbered from 1 to 20 inclusive, and the questions under expenditures from 21 to 31 inclusive. It was not only interesting but somewhat amusing to study the expenditure items against the general information items. For instance, question 5 is, "Where do you get your water (city, well, or other source) ?" Some of our green chairmen would report back that they got their water from the city, and then under question 29, "Cost of water," zero. Obviously that was wrong, and it gave us a chance to get back at the club and have them check that item. Under questions 6, "Have you any water pumps?" and 7, "If so, what is the total horsepower of the motors driving them?" they would answer that they have water pumps and get their water from a creek or pond, and under question 30, "Cost of pumping," zero. That was wrong, and that again gave us a chance to get back at them for further checking.

It is interesting to know that from extended correspondence back and forth with the green chairmen of the 38 member clubs on this questionnaire, we have dug out from them facts that are obviously wrong, and they have corrected their forms on their books, so that with the 1928 season we expect to get reports that are more fairly accurate.

The question of the cost of construction work we have undertaken to set up as an item to be deducted from the total layout of money for the golf course maintenance including work construction, so that we bring the analysis down to a cost of golf course maintenance strictly as a maintenance item, and show at the same time a separate figure for the construction work.

After the questionnaire was returned by almost every member club, we listed the 38 clubs on the margin of a blueprinted form, and across the top listed the 31 items that are in the questionnaire, so that in sending the blueprint to the chairman of the green committee in each club he was able to sit down with his greenkeeper and get a definite and accurate picture of what he was doing compared with other clubs in the district.

It is a pleasure, after putting so much work on this problem, to report that the chairmen of our member clubs are deriving substantial benefit from this work, and we hope that, with the introduction of the new form, the 1928 analysis will show us figures more in line with what we want to see in the district cost analysis.

If anyone would like to have copies of the new form which we propose to print soon, and will write to the Detroit District Golf Association, 2843 East Grand Boulevard, Detroit, we shall be very pleased to send them.

## Rural Weather Lore Is Frequently Reliable

Intelligent farmers and others engaged in outdoor work nowadays are not greatly interested in predictions in almanacs or in other long-range fiction, according to Dr. W. J. Humphreys, of the Weather Bureau. They rely on official reports by radio and on their own observations. Scientific forecasting of the weather does not place reliance on many of the old "signs," particularly those that are supposed to forecast one season from occurrences in the previous season. But Dr. Humphreys says that many of the sayings in regard to the weather that have been handed down from generation to generation are based on many observations and are often reliable. For example, he says a

warning of some value but not highly reliable is embodied in the verse:

A rainbow in the morning
Is the shepherd's warning;
A rainbow at night
Is the shepherd's delight.

"A pretty good guess" is to be found in:

If the sun sets in gray
The next will be a rainy day.

One of the "very best indicators of the weather for the day," Dr. Humphreys says, "is the state of the dew in the morning. It gathers on the grass and other exposed objects when they are cool enough to condense it out of the air, just as moisture is condensed out of the air on the side of a pitcher when filled with ice water. Now, the grass and other outdoor things cool considerably only on still, clear nights, the kind that occur during a spell of fine weather and at no other time. Hence a heavy dew means that the air was still and the sky clear, at least during the latter half of the night. And it is pretty certain that if there was neither wind nor clouds during that time, the day will be a good one for all outside work. On the other hand, if there is no dew in the morning it is almost certain that either the sky was clouded or that there was appreciable wind, or both; and both, as a rule, precede a general rainstorm by 6 to 12 or even 24 hours, according to circumstances."

Consequently Dr. Humphreys says there is much reason back of the two proverbs:

When the grass is dry at morning light
Look for rain before the night.
When the dew is on the grass
Rain will never come to pass.

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Mistakes are made by the best of us. Don't take a man to task for an occasional mistake he makes. It is by mistakes that he learns.

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**Cleaning up the rough.**—Much of the congestion on a golf course and slowing up of play which occurs on holidays or at other busy times is occasioned by efforts of parties to find balls lost in the rough. The function of the rough is to check a ball which overreaches a fairway, and not to lose the ball. This object is best gained by a low-growing grass. The turf need not, however, be equal in quality to fairway turf, and generally a sparsely growing, drought-resistant grass, that requires no attention, either as to mowing or fertilizing, is considered ideal for the purpose. Such a grass can as a rule be found native over most parts of the country. Often the soil of the rough is rich in character, promoting a growth of weeds and underbrush, in which the recovery of a lost ball is hopeless. In such cases the top soil can be scraped off and used to advantage elsewhere on the course. Sheep's fescue and Canada bluegrass have generally been found to be ideal grasses for the rough. They do well enough on poor, dry soil, and are adapted to most parts of the United States, especially the North. Of first importance, however, is the removal of underbrush, weeds, and the large bunch-grasses which as a rule occupy waste places.

## QUESTIONS AND ANSWERS

All questions sent to the Green Section will be answered in a letter to the writer as promptly as possible. The more interesting of these questions, with concise answers, will appear in this column. If your experience leads you to disagree with any answer given in this column, it is your privilege and duty to write to the Green Section.

While most of the answers are of general application, please bear in mind that each recommendation is intended specifically for the locality designated at the end of the question.

**Early spring cutting and rolling**—How early in the spring may we start cutting our putting greens? Is it safe to start cutting just as soon as the grass takes on a little color and life? Would it be injurious to the greens if we should start cutting them and then have a severe freeze follow the cutting?

ANSWER.—Our experience indicates that no injury to grass is likely to result from mowing any time after it starts to grow in the spring. Even though a freeze occur after mowing there is no indication that grass that has been cut is more subject to injury than grass that has not been cut. We frequently find greenkeepers who feel that grass should be allowed to make some growth in the fall for winter protection, but our experience indicates that grass may be mowed as long as it is making growth without suffering any more seriously than grass that is allowed to go into the winter with quite a little growth. In the northern states spring usually finds the turf very uneven as the result of heaving. Before mowing, this condition should be remedied by rolling, otherwise the turf is likely to be injured in high spots by scalping. Rolling should take place soon after the frost is out of the ground and while the soil is still well supplied with moisture but not so saturated that puddling is likely to result.

**Value and use of humus.**—We can buy commercial humus in carload lots for $7.50 a ton at point of shipment. What value would it possess as a substitute for compost in top-dressing putting greens? (Kentucky.)

ANSWER.—Humus can replace compost to only a limited extent. It is pure organic matter in various degrees of decomposition. Some kinds of humus, if spread on turf, would dry out and remain on the surface as an inert covering of woody material much resembling chips or bark. It is slow to break down, and is of most value when mixed with soil, since it can greatly improve the physical structure of all but peaty soils. Compost, on the other hand, is soil in which considerable humus has been incorporated, and sometimes also other fertilizing materials. In using humus in the compost pile, first a layer of soil is laid down, then a layer of humus, then a layer of manure. This operation is repeated until a pile of layers several feet high is built. While constructing the pile it is advisable to throw lime on the humus at the rate of 25 pounds of lime to a ton of humus. If manure is scarce, the layers of manure may be comparatively thin. Fresh manure is of more value for this purpose than rotted manure, since the former contains various micro-organisms which assist in decomposing the humus and releasing plant food, and it will heat and decompose more rapidly than rotted manure. Another use for

humus is in the preparation of good top soil. An area of rough or waste land on the course may be top-dressed with large quantities of humus. Sharp sand may be added if the soil should require it. Fresh manure should then be applied at the rate of several tons to the acre. The area should then be plowed and disked. If the area is then cultivated so as to keep down weeds it will provide a fertile top soil of good mechanical structure. In our opinion, a price of $7.50 a ton at point of shipment is out of proportion to the value of any kind of commercial humus. We feel certain that fine garden loam could be purchased much more cheaply, and it would possess fully as much value provided it were of an open, friable texture. Heavy clay soils can be broken down by the incorporation of strawy manure, which can be procured more cheaply than humus and which is of more value. Also light sandy soils can be improved by humus in the form of manure, which can probably be obtained at a lower price than that which has been quoted to you on commercial humus.

**A "universally complete fertilizer."**—Would you recommend the fertilizer mentioned on the enclosed advertisement as one of the best and most complete grass foods on the market today for use on putting greens? Does the chemical analysis stated indicate sufficient value to warrant its use in preference to some other fertilizer at the price quoted? (New Hampshire.)

ANSWER.—We can not recommend the fertilizer to which you refer as "one of the best and most complete grass foods on the market today." It is unquestionably a good fertilizer for grass, but neither its chemical analysis nor its performance on turf will support many of the claims made for it. The fertilizer industry today is able to duplicate any mixture suggested, but that industry has yet to find a fertilizer that is best for any one plant on all soils. There is such variation in soils that any manufacturer who gives an honest opinion as to the much-desired "ideal fertilizer" will admit that any combination of plant foods that is noticeably successful when used on one type of soil may be far from effective on another type. We suggest that before purchasing fertilizers you consult a reputable local dealer as to prices he can quote you on a mixture containing the same combination of plant foods. You will doubtless find some helpful information in the June, 1928, number of the Bulletin, and particularly in the article entitled "The Fertilizer and the Bag," appearing on page 113. On the preceding page of that Bulletin you will find a table containing many data on the point you bring up. In that table no allowance was made for prices, since these vary greatly in different places, due to freight rates and other local factors.

**Controlling weeds by fertilizing turf.**—We have been liming our fairways for years and as a result have had a great deal of plantain. What treatment would you recommend to control this weed? (New York.)

ANSWER.—Lime alone usually does not improve old turf which has had no other treatment. Lime acts as a corrective agent rather than a fertilizer and under some conditions is decidedly beneficial. Unless other fertilizers are used which contain abundant nitrogen, grass will probably not improve noticeably on your fairway. If you feed the grass properly, you will no doubt find that the plantain will be largely crowded out.

**"All that I have accomplished, or expect, or hope to accomplish, has been and will be by that plodding, patient, persevering process of accretion which builds the ant-heap—particle by particle, thought by thought, fact by fact."**

—ELIHU BURRITT.