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BETTERMENT OF GOLF COURSES

CONTENTS.

	Page
The Greenkeeper and His Green Committee.....	234
Collective Buying for Golf Courses. By G. A. Farley.....	235
Instructive Golf Holes XIII. No. 17, Merion Cricket Club.....	236
The Million Dollar Endowment Fund for the Green Section.....	239
Injuries to Putting Greens by Careless Mowing. By W. S. Harban.....	239
Named Strains of Creeping Bent.....	240
Some U. S. Golf Association Decisions on the Rules of Golf.....	240
Meeting of the United States Golf Association Green Section at Overbrook, Pa., September 24.....	241
Watering Putting Greens.....	245
Fall and Winter Top-Dressing of Putting Greens. By R. A. Oakley.....	248
Questions and Answers.....	250
Meditations of a Peripatetic Golfer.....	256

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GIVE US YOUR 1924 EXPERIENCE WITH BROWN-PATCH.

We are anxious to learn of your 1924 experience with brown-patch, both the large and small kind.

Please write us fully, giving us (1) the date or dates of appearance, (2) severity of attack, (3) measures used to combat, and particularly (4) the results you have gotten from any of the new fungicides.

It is planned to publish a full report on all the brown-patch data for 1924. Your cooperation is wanted in gathering information on which to base our report.

The Greenkeeper and His Green Committee

Broadly speaking, there are two sorts of greenkeepers. In the first group is the one that is devoid of initiative and enterprise, who never offers a suggestion and who rarely does anything except on the express instructions of his green committee chairman. In the other group is the one who can meet most problems or difficulties as they arise and who has the confidence and skill to go ahead, even if his chairman is traveling in Europe or fishing in Canada.

Which kind do you want at your club—the timid employee or the competent and capable assistant? In a very large measure the green committee make the greenkeeper efficient or incompetent, regardless of his actual ability. If you want a timid, cringing greenkeeper afraid of his soul, bark at him every time anything is wrong. Make him the “goat,” regardless of circumstances. Give him a lot of orders to carry out; if several of them are conflicting, so much the better. Do not for a moment let him think he has any brains of his own. But do not overlook the likelihood that no matter how stupid he may be, he will at least soon know that you promptly forget most of the instructions you have given him. Furthermore, an intimidated man becomes secretive and resentful—indeed, may be tempted to do things which he knows are harmful.

It is safe to say that ninety-nine out of every one hundred men who have really learned anything about the upkeep of a golf course, especially the turf, are modest as regards their knowledge. Nature in one of her unfathomable moods is sure to humble the pride of the fellow who thinks he knows it all. Something or another will cause trouble, which all the doctors will fail to diagnose. It is this type of fellow who kids himself that he knows all about greenkeeping, that develops the timid, cringing type of greenkeeper.

In sharp contrast is the green committee or its chairman who takes the greenkeeper into partnership. It is their joint work to make the course as good as possible and to keep it in the best of condition. This is no easy task, but it is rendered much less difficult if the greenkeeper is given proper responsibility so that he takes pride in doing his best. He will doubtless make some mistakes, but if these are thoroughly discussed he will probably never make the same error twice. A considerate committee can train a young man of farm experience to become a first-class greenkeeper. An inconsiderate or carping committee will never be able to do this.

Collective Buying for Golf Courses

By G. A. FARLEY

Collective buying pays. There isn't a doubt about it. For golf courses it is in its infancy, and like all healthy and intelligent infants, it has its refractory spells, which must be overcome one by one and generally by a different method each time. However, every difficulty overcome makes of it a more perfect thing, and more definitely justifies its existence.

The Green Section of The Cleveland District Golf Association, of which Mr. J. K. Bole is chairman, was inaugurated as a bureau of service to member clubs. Early in 1922 it came to Mr. Bole's attention that a number of tractors were required in the district. He therefore suggested to the clubs that thorough tests be made to determine the most suitable power unit for golf course work. These tests were conducted, manufacturers interviewed, and as a result substantial discounts were allowed on quantity orders. This saving created a demand among the clubs for better prices on other maintenance equipment and supplies, and it was found necessary to open offices in February, 1923, for the purpose of handling the business on a larger scale. Since that time it has been my pleasure to be associated with Mr. Bole in the Green Section service.

In 1922 the clubs in the Association numbered seventeen. We now have thirty-two, and as most of them place their orders through our office, the service has steadily and rapidly increased.

Wherever possible we buy direct from the manufacturers, or from manufacturers' agents, securing as a collective buying agency considerably larger discounts than can be quoted to individual clubs. Through interviews with the sales managers of local wholesale hardware and equipment dealers, we secure excellent discounts as well as quick service.

On quantity orders for material we follow the usual method of getting in bids from five or six sources, and we also contract for unloading and laying down on the courses carload lots of sand, manure, pipe, drain-tile, etc.

Perhaps one of the greatest difficulties encountered in collective buying for golf clubs is securing orders for standard equipment and supplies far enough in advance to take advantage of the market and insure delivery at the required time. This condition is improving, and we find orders coming in soon after the chairmen of the greens receive a bulletin from our office quoting price and delivery on a commodity. By means of these bulletins, giving information of various kinds relating to changes in price, shortage of supply, newly tested and approved pieces of equipment, and other matters of interest to him, each chairman is kept in close touch with the Green Section activities at a minimum expenditure of time and trouble to himself.

In order to insure success in such an enterprise the full cooperation of the chairmen and greenkeepers is most necessary. As early in the year as possible our greenkeepers submit requisitions to their chairmen covering the requirements of the coming season, recommendations are made upon request by the Green Section office, and orders placed in advance for spring delivery.

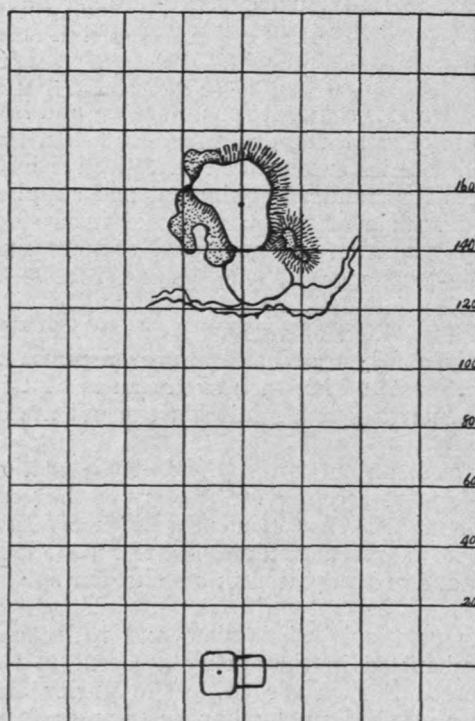
Grass seed is purchased from reputable wholesalers and recleaners, and samples from these dealers submitted in the spring are sent to the United States Golf Association Green Section for test as to purity and germination. These tests are later checked up by having samples from actual shipments into the district tested in the same way.

We receive inquiries from various parts of the country as to how we organized a Green Section and how we financed the service. Membership in this branch of our organization is at the rate of \$50 each year per nine holes. This membership is an investment on the part of the club which has in many cases shown a handsome return. During 1923 some of our clubs were saved from \$200 to more than \$900 on an original investment of \$50, and this plus the general information service available at all times. This year one of our new clubs in the process of construction has already saved more than \$1200 through the collective buying power of the Green Section.

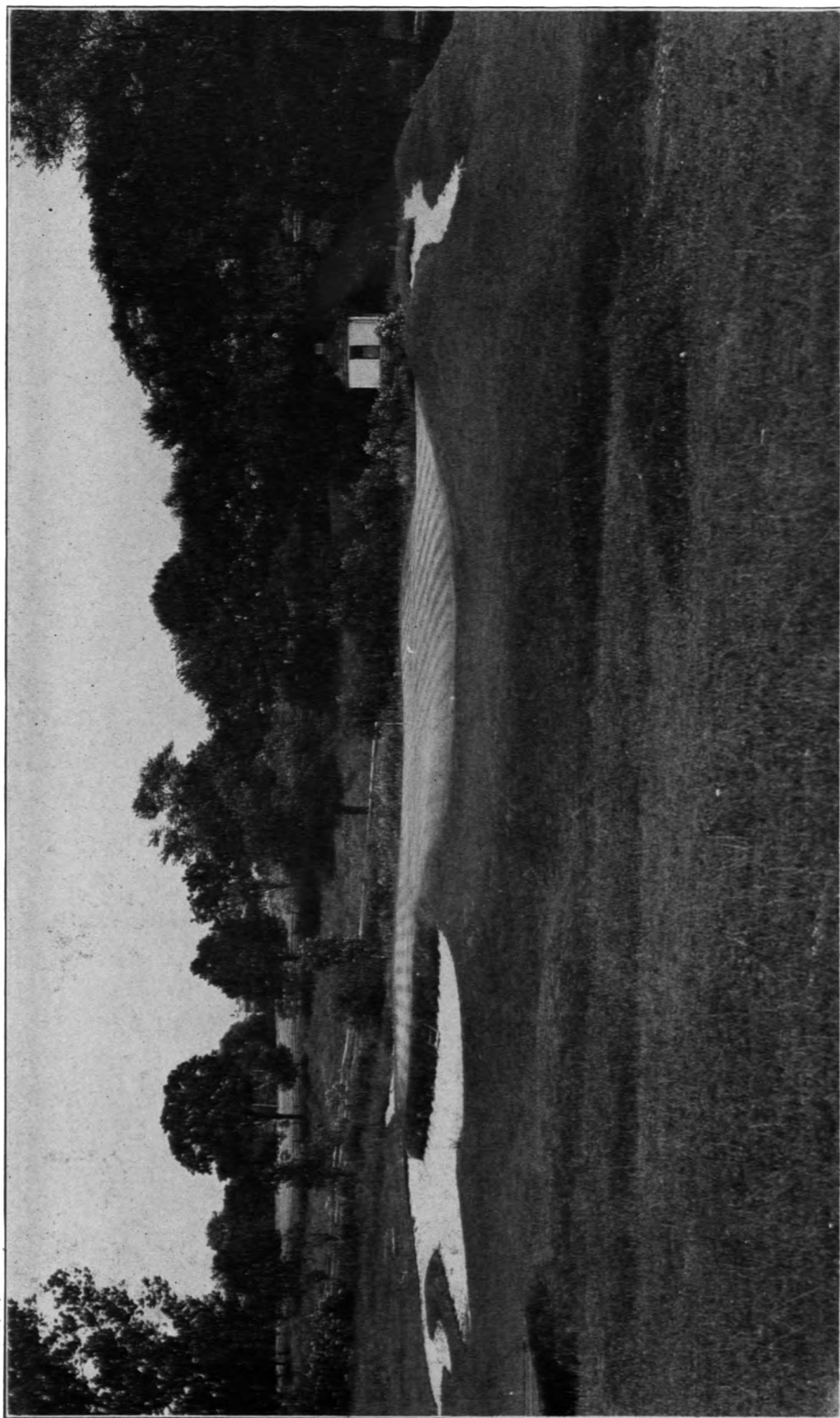
The mission of the Green Section is to improve the courses and reduce the cost of maintenance, and any community supporting ten or more golf clubs would do well to consider the advantages of collective buying. The saving in dollars and cents is by no means the only advantage; the clubs gain far more in protection than they do in money. Manufacturers are quick to recognize a local Green Section that insists upon quality, service, and price, and those who are putting out the best on the market should be given every consideration in placing the business of such an organization.

Instructive Golf Holes, XIII

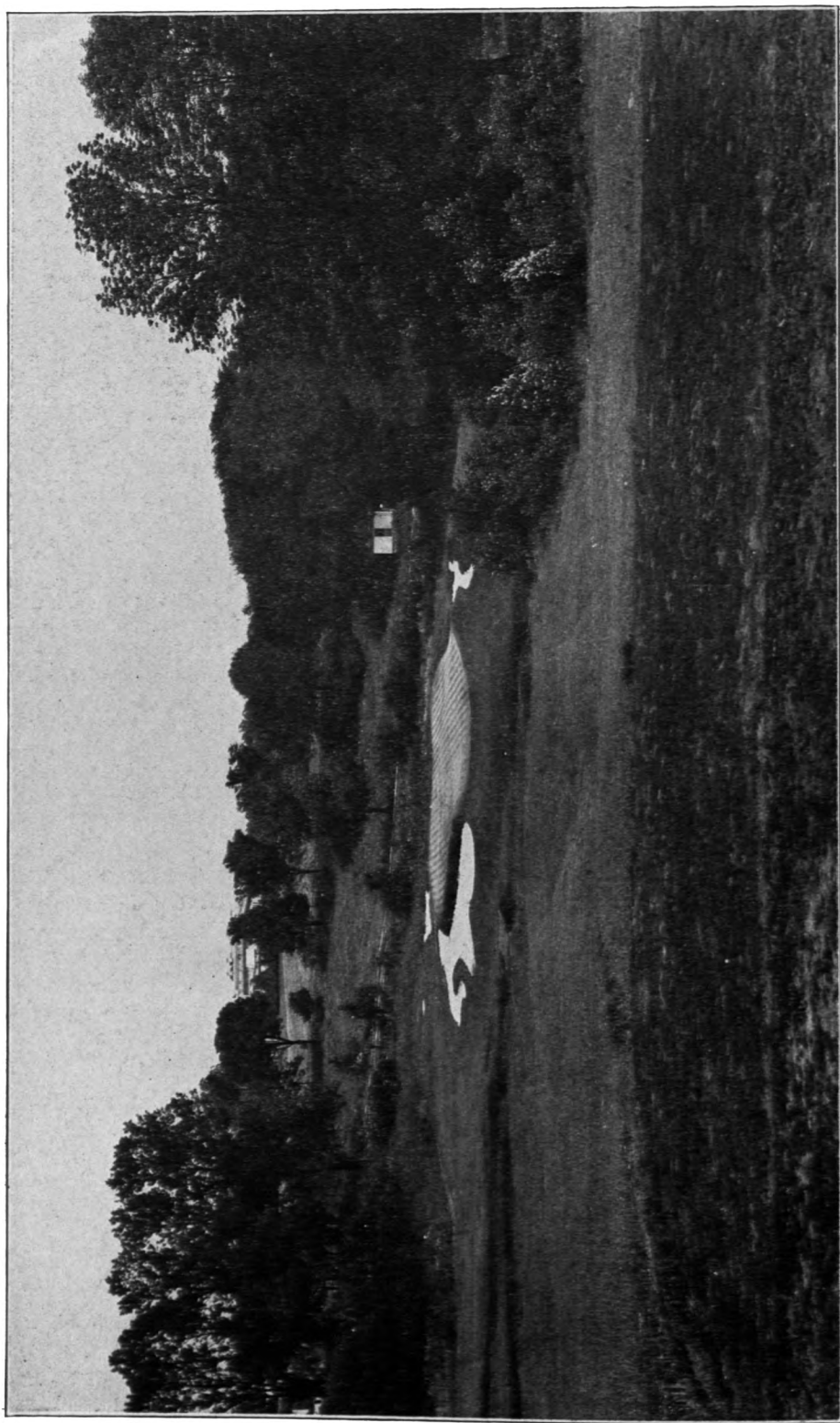
No. 17, Merion Cricket Club (West Course), Haverford, Pa. 155 yards.



A lovely green in a charming setting, illustrating golf architectural beauty to a high degree. The tee shot to the center of the green is 155 yards, over a "bonnie brae" 10 yards in front of the green. The putting sward measures about 4,500 square feet. The surface is very attractively undulated, and the bunkers are so pretty that, so it is said, most golfers do not swear if the ball lands in one.



Hole No. 17, Merion Cricket Club. Close-up View of Putting Green.



Hole No. 17, Merion Cricket Club. View from Tee.

The Million Dollar Endowment Fund for the Green Section

The campaign for the Million Dollar Endowment Fund for the Green Section has been put in motion by the United States Golf Association. The formal announcement to this effect was made at a Green Section Meeting held September 24 at Overbrook, near Philadelphia. Full details appear elsewhere in this issue.

Now is the opportunity for everyone who believes in the Green Section to help put it on a permanent basis that will insure its continued efficiency.

October 25 is set aside as a Green Section Tournament Day for trophies given by the United States Golf Association. The primary object is to get the playing golfers acquainted with the Green Section and its work.

The opportunity is here for every Green Section booster to help start the good work. For the good of golf, we expect every man to do his duty.

Injuries to Putting Greens by Careless Mowing

By W. S. HARBAN

It would hardly seem necessary for one to write upon a subject so well understood and so universally practised by all good greenkeepers as that of how to use a mower without causing injury to the turf. Recent observations at many courses, however, clearly indicate there are yet many greenkeepers who, either from ignorance or indifference, permit their greens to be horribly disfigured by careless mowing. The two most common injuries come from scalping the high spots, and from scraping incident to faulty turning of the mower. In either case, this careless mowing will, when several times repeated at the same places, kill the grass roots, and leave large bare areas that are naturally unsightly and exceedingly harmful and annoying in putting. That it is possible to avoid such injuries is well evinced on all well-groomed courses. *It is the province of the greenkeeper to grow, protect and preserve the turf; not to destroy it.*

Let me say just a word or two about the mechanism of the mowers in use today. Scientifically they are as nearly perfect as human ingenuity can make them. They are safeguarded by wheels and rollers in such a manner that the grass can be cut with impunity very closely on true level places and with as much assurance as you trust your safety razor. Like the razor, where the bumps or angles appear, it requires easing over them. This can be done with the mower by slightly depressing the handle, throwing the principal weight of the machine on the rear wheels or roller, thereby easing the knife. This does not necessarily mean that the grass is left longer on the high places but insures that it will not be cut shorter. Never straddle a high point or ridge if it can be avoided.

All mowers of every kind and make are designed to be rigid. Therefore when all the wheels and rollers are on the ground the mower can not be turned without dragging, bruising and scraping the turf or the soil under it. By depressing the handle bar sufficiently to place all the weight on the back rollers, entirely lifting the front of the machine so as to be free, the rollers are made to turn easily without the slightest injury to the turf. I have been asked many times how to mow one of the modern built-up or island greens when the entire surface has to be cut to the edge of the banks,

and at the same time keep control of the mower. Very often these outer edges are more or less undulated; consequently they require most careful handling of the machine. The only way I know that a man can properly control a mower is by having his hands on the crossbar of the handle, and in order to do this he must have room to stand. I have always advocated first making several circular cuts around all greens, whether built up or not, to preserve the lines, if for nothing else. With these island greens, four or five such cuts will give ample room to cross-cut from any direction.

If the few simple hints described above are carried out in practice we will not see many mangled greens hereafter.

Named Strains of Creeping Bent

When in 1916 the first tests were undertaken of individual strains of bent grasses, about one hundred different selections were made. Each of these selections was given a number and a record was preserved of its origin, characteristics, date of selection, etc. In 1921 some of the best of these selections were distributed to a few golf clubs, each under its appropriate number. A year later it seemed desirable that the more promising ones be given names. To keep the record of each strain numbered and named by us, the following data are supplied. These are the only bent strains named by the Green Section up to date.

Washington Bent. No. 02986. A creeping bent selected in 1919 from No. 4 green at the Washington Golf and Country Club, near Rosslyn, Va. At the time the selection was made, the piece of turf selected was only slightly affected by brown-patch, although nearly the entire green was brown.

Metropolitan Bent. No. 02809. A creeping bent from a piece of turf sent in for identification in 1917 by a seed firm in New York City.

Virginia Bent. No. 02987. A creeping bent selected in 1919 from No. 18 green at the Washington Golf and Country Club, near Rosslyn, Va. The selection, at the time it was made, was found to be strongly resistant to brown-patch, but not immune.

Columbia Bent. No. 02529. A creeping bent selected in 1916 from Columbia Country Club, near Washington, D. C. This is the strain used to plant No. 9 green at the Columbia Country Club.

Vermont Bent. No. 02882. A creeping bent received in 1917, without any special data, from Middlebury, Vt.

Acme Bent. No. 02541. A velvet bent selected in 1919 from the grounds of the Department of Agriculture, Washington, D. C.

Revere Bent. No. 02511. A seaside bent from the wet salt meadows at Revere Beach, Mass., where it occurs in large areas.

Some U. S. Golf Association Decisions on the Rules of Golf

QUESTION.—Please advise us in reference to distribution of prizes in qualification. On Saturday our club had qualifying round for five sixteens medal play handicap net scores. Because a large number of our members go away over week-ends during this season of the year, we allowed them the privilege of qualifying any day during the week previous by signifying their intention to a member of the Committee. Now the question arises, Are these players eligible to win either of prizes offered, low gross and net?

ANSWER.—The Committee in charge of golf tournaments have entire authority to arrange the conditions according to their best judgment. If therefore your committee gave the privilege to a large number of members to play in the qualifying round under the conditions you mention they are entitled to compete for the prizes as well as those who played on the day originally scheduled. In the opinion of the Rules Committee of the United States Golf Association, however, a qualifying round competition should always be played on the same day where conditions are more apt to be uniform.

QUESTION.—A, B, C, and D, are playing a four-ball match, A and B being partners and C and D partners. All four balls are on the green, C's being nearest the hole and A's farthest from the hole. C thinks that his ball may aid A in making A's putt, and therefore, before A putts his ball C lifts his own ball, claiming he has this right under General Rule No. 1 for three-ball, best-ball, and four-ball matches. A claims that he only, being "the player," has the right to request that the ball be lifted or putted, and that C has no right to touch his ball unless requested by A. What is your decision in the matter?

ANSWER.—Rule 1, "Rules for three-ball, best ball, and four-ball matches," covers the point. C was well within his rights in having his ball lifted.

QUESTION.—We have had quite a little discussion on the following rule, and I would appreciate it if you would give me the rule as you see it. "May a club be soled in a path worn to the bare earth by the players as they walk away from the tee?"

ANSWER.—You are referred to definition 6, "Hazard," as follows: "A hazard is any bunker (except casual water), ditch (unless excepted by local rule), bush, sand, path, or road. Sand blown onto the grass, or sprinkled on the course for its preservation, bare patches, sheep tracks, snow, and ice are not hazards." It is clearly a case for your local committee to decide whether this spot you speak of is a path or a bare patch; the first would be a hazard, and the second would not.

Meeting of the United States Golf Association Green Section, Green Hill Farm Hotel, Overbrook, Pa., Sept. 24, 1924.

The meeting was called to order at 8:15 p. m. by the Chairman, Mr. H. Kendall Read, Secretary of the Philadelphia District Green Section, about one hundred persons being present. Following introductory remarks, the Chairman introduced Mr. Wynant D. Vanderpool, President of the United States Golf Association. After reviewing the story of the establishment of the Green Section and the very important position it has come to occupy in the golf world, Mr. Vanderpool continued as follows:

"About a year ago the United States Golf Association had a meeting, and we decided that if the Green Section was to be put on a sound basis it was necessary to raise a very substantial sum of money, the interest from that money to be used in the further development and promotion of the Green Section work. Mr. J. Francis Burke, who was then our General Counsel, very generously gave his services, and the Green Section was incorporated in Pennsylvania. It is a corporation not formed for profit. It is formed for encouraging investigation and education in turf production for golf courses, parks, etc., and then there is a long list of other things that follow. The main point is to carry on and develop this work. It is not an organiza-

tion for profit; it has no capital stock, and all funds will be applied to the promotion and advancement of the purposes for which the association was formed. We have in mind a very large sum of money, one million dollars. We probably won't raise it all at once. We want to make a start now, and I think the time is ripe to make the start. There is little appeal to the average person in contributing money for investigations of this sort; but when you think of the great work that has already been accomplished in such matters as use of seeds and fertilizers, the control of the Japanese beetle, and the many other problems we have had, it really is a great big thing. If everybody here puts his shoulder to the wheel we do not think we will have much trouble in raising this money eventually. Everyone in the United States Golf Association is absolutely back of this enterprise. They are not only taking off their coats and working, but are contributing substantially to it. We have been very fortunate in securing the services of Mr. James G. Blaine, Jr., of the New York Trust Company, as our campaign manager. I think you will agree with me that we must keep this Green Section going, and the only way to keep it going is to raise enough money so that we can have an amount sufficient to run it, to edit THE BULLETIN, and to answer all the correspondence and enlarge the work or the scope of activity in every way. We have decided to launch this proposition at this meeting. This is the initial announcement of the campaign. We have given it to the press, and Mr. Blaine will make a further announcement of what we propose to do during the next fall and winter to make a start in the raising of this money."

The next speaker was Mr. James G. Blaine, Jr., who has undertaken the task of completing the campaign to raise the Million Dollar Endowment Fund. His complete address follows:

"Gentlemen, this is one of the most embarrassing moments of my life, for two reasons. First, your Chairman started off by saying we have a big representation of American golf here. The second reason why I am embarrassed is because everybody here knows more about the Green Section than I do. I know very little about it. I know a great deal more than I did six months ago. But I would like to tell you how I came to get the job. I am fortunate, or unfortunate, to be a banker. Well, Mr. Vanderpool came in one day, and he said, 'I have been around to see a lot of respectable business men and they won't do this thing, so we finally decided that the only fellow we could get would be a banker, and we therefore concluded to come around and see you, because we thought you would be a good promoter. So here I am.

"This is not an easy job. They have kept it dark as to how much money they want. They want a million dollars. That's a lot of money. I think it can be raised. I don't think it can be raised all at once, because it is hard to get money in this world. It is awfully hard to get money for an unsound thing, but easy to get it for a sound one. This is a *sound* thing. It is economically sound, inasmuch as the Green Section has saved many hundreds of thousands of dollars to the golf courses, because it started them right. It seems to me that this is sound, constructive golf economics, and that it deserves the support of everybody. It may be a tough idea to sell, because it has not got any thrill to it. Just as Mr. Vanderpool said, I can't get excited at once at the thought of giving money to grow grass right. We are not banking on a first impression of the thing to get the money, but what we are striving for is to get the people to do a little thinking. As you start thinking you see it is good, and you come

across. I came out here this afternoon in a hurry to talk to about fifty representatives of the press. Each one was getting his story off, and somebody said, 'Stop the telegraph machines.' They all looked cross, and one of them said, 'There is a fellow who is going to talk to you about the Green Section.' I talked about the Green Section to them. I said, 'I have not anything to tell you now, but we are going to send you the story to print, and we want to tell you about it and have you talk about the idea, and then we will supplement the idea with some news.' Now the first thing we have to do if we are going to raise a million dollars is to make an awful lot of golfers know what the Green Section is. When Mr. Vanderpool came in and told me about the Green Section I didn't know what it was. I am only one of a million golfers, and didn't know anything about it. The golfer you want to get the money out of to support this thing doesn't know, and he has got to know if you expect to get a million dollars. We have devised a plan. The first half of the plan is perfectly clear; the second half is still within the nebulous state. The first half of the plan involves, primarily, publicity. We have some publicity ideas, which will come out in all the golf publications in October. We have leased further publicity which will come out in all the newspapers in the country through the Associated Press and the N. E. A. We propose to hold a golf tournament October 25 throughout the United States. We are going to ask the 4,000 golf clubs if they will each pull off a handicap golf tournament against par. Anyone out playing on Saturday, October 25, by paying one dollar, can participate. The fellow highest up on par in the United States will get the National Prize from the United States Golf Association. If more than one fellow gets it, they will all get prizes; but the more fellows who get prizes, the less the value of the prize, because the United States Golf Association can't afford to spend a lot of money on prizes. We propose that they charge a one dollar entrance fee, and the local club will retain 25 cents and forward 75 cents to the United States Golf Association Endowment Fund. I said to Mr. Vanderpool, 'Either one of two things is going to happen; it is either going to go good or it is going to be a flivver.' I think it will go good, because it doesn't interfere with any other golf tournament. It doesn't interfere with anybody's playing. It is simplicity personified. The only other thing is, we are going to ask the club secretaries or caddie masters if they will give to each man who enters the tournament and every visitor a pamphlet, which we shall supply, explaining what the Green Section is and what it means. The primary move is publicity. We are going to ask the club secretaries to post this in all their clubs. We are going to get 75 cents out of each one; and if a lot of fellows come in, and it takes, we are going to get some money. But I am more interested in the publicity than in the dollars. We want the dollars, but the primary thing is to get the publicity, because that involves the second step in this campaign.

"The second step, as I stated before, is still nebulous. The second step is what I call 'the knock-'em-dead movement.' That is where we will take a lot of fellows who can tell a lot of other fellows where they get off, and they will go out and say, 'You have got to give us \$500,' and 'You have got to give us \$1,000;' and in that way pick up substantial sums. But the more publicity we have before 'the knock-'em-dead movement,' the better we are going to knock them dead. First of all, we are going to get the press with us. We are going to get signed articles from the crack golfers. We are going to try to make this thing thrill. I think it can be done; but we have to get everybody interested. The more you fellows back it, the

more support we will get from the outside. People have got to be taught what the Green Section is; that it means the saving of money and the improving of golf courses,—for instance, this new machine for planting stolons. Dr. Piper and his associates have been carrying on this thing; but they can't go on forever—they have got to have the money to train other men to continue the work. It is no easy job to raise one million dollars. I think it is the toughest money-raising job I ever got into; but I think it can be done. We bespeak your most earnest cooperation in this thing. The first publicity work will be ready shortly. We are sending out 750,000 pamphlets. We are doing everything we can on our end from a personal side. We want your personal equation brought into it so that everybody you are interested in will be working for it and we will make enough money out of the entrance fees to give them a good sound start so that we can approach 'the knock-'em-dead movement' with the confidence that we are going to put this thing over in the next six or eight months."

The final speech relating to the Endowment Fund was made by Dr. Walter S. Harban, introduced as the Nestor of American Golf. Dr. Harban spoke very interestingly of his early struggles to grow and maintain good golf turf and his persistent efforts to find some one who could help him in his turf problems. Finally he found Messrs. Piper and Oakley, who he said have never given him any rest since; but he admitted that he was in a large measure responsible for getting these gentlemen active in the work of real investigations of grass turf. He recalled many interesting incidents leading to the formation of the Green Section. Dr. Harban emphasized the following points which made the Endowment Fund necessary if the Green Section work was to be permanent.

1. The need to enlist trained young scientists in the work to carry it on in the future.

2. The necessity of enlarging the experimental work and of conducting the basic scientific experiments in each portion of the country with cooperation of the agricultural colleges. Incidentally this will lead to courses of turf instruction in these colleges and thus train a body of scientific greenkeepers.

3. The importance of having THE BULLETIN reach every golf club and every individual interested. This can be done only by fixing a low subscription rate. This is not possible under the present system of support of the Green Section.

4. A larger staff for the Green Section at Washington is imperative. The enormous amount of correspondence to answer, the publication of THE BULLETIN, and the experimental work now carried on are too much to ask of three men who can at best devote but small portions of their time to the work. Urgent calls for assistance are of necessity denied; and there should be men who can devote a part of their time to this function.

5. The Green Section has only begun its work. It is utterly foolish to think for a moment that its task is well nigh finished. If we support it properly we shall be repaid a hundred fold. If we allow it to perish (and without the Endowment Fund that will surely happen) it will be but a few years until most of the golf clubs are buying all sorts of nostrums that glib salesmen will induce them to buy; then they will again become the victims of commercial quacks.

The remainder of the time of the meeting was devoted to real green-keeping. Addresses were made by Dr. Piper and Dr. Oakley, each resulting in a free-for-all discussion, in which nearly everybody took part.

Watering Putting Greens

There is still much difference of opinion as to the best time of day to water putting greens. Some rather extensive and well-planned experiments on the subject were once carried out by Mr. Frederick W. Taylor at Highland, near Philadelphia. If there were any differences in these plats due to time of watering, they were not appreciable. Of course, under other conditions pronounced differences might occur. The question has recently been raised again by a gentleman from Massachusetts. Perhaps the best data on the subject available are the judgments of men of long experience. That there is still difference of opinion in the minds of men who are well qualified, is apparent from the following statements recently received in reply to a questionnaire sent out on the subject.

"The latitude in which you are located, the soil you have to work with, and the kind of grass in your putting greens may have a large bearing on the watering problem, whether it be the frequency or volume of watering or the time of day it is done. Our experience has been that watering greens may be done at any time during the twenty-four hours without fear of damage. However, we prefer to do our sprinkling promptly after sundown, as we get away with the minimum amount of loss of moisture by evaporation at this time, with the long hours of the night ahead, and the effect is more beneficial and lasting."—*A. J. Hood, Plum Hollow Golf Club, Bedford, Mich.*

"I have never experimented with watering except during the day and in the evening. I have always gone on the theory that water put on in the late evening was less subject to evaporation and had time to soak in before morning. I have done lots of watering during the day and have never seen any ill effects from it except that without definite data to guide me I have assumed that it took more water to accomplish the same effect in the morning than it did in the evening. The possibility that to begin watering just before sunrise may have an effect on brown-patch is quite interesting, but I have not so far been able to arrange to experiment."—*Robert White, Wykagyl Country Club, New Rochelle, N. Y.*

"I know that the proper time of day for watering putting greens is a moot question. However, I have always contended that the time to water was when the sky was overcast. We do all our watering after 6 o'clock in the evening. When it comes to a question of expense, it may be a little more expensive to water at night, as we have to pay more for labor, but it is really more convenient for the players, as it is not necessary then to move the hose, sprinklers, and other apparatus about. I have always had the impression that watering when the sun was beating upon the grass tended to injure it."—*Charles B. Macdonald, National Golf Links and Links Golf Club, Long Island.*

"It is my opinion that although watering during the heat of the day does not seem to cause serious injury to fine turf, yet infinitely more benefit can be derived from watering after sundown. To maintain a vigorous growth of creeping bent it is essential to keep the greens in a moist condition. Any one familiar with production of bent turf from stolons, is aware that there is a definite check in growth when the soil is allowed to get really dry. Having that requirement in mind, it can be seen that one should aim at obtaining the maximum amount of value from every gallon of water used. A green watered, say, at 10 a. m. in midsummer

will dry very rapidly. In four or five hours after watering, the turf is dry probably two or three inches down; whereas a green watered at 6 p. m. remains moist on the surface until the sun is well up the next morning, which, at 10 a. m., gives 16 hours as against four or five hours in the case of morning watering.

"Daily watering of 18 greens during the dry season of 1923 decidedly enhanced the quality of the bent on the greens and resulted in a far smaller amount of crab grass than in previous years. Exactly what the effect of such heavy watering over a period of years would be, I am unable to say. I have not spent one dollar in 1924 in additional labor for weeding greens, and I believe I am prepared to state that crab grass does not thrive on greens which are kept in moist condition.

"The relation of watering to the treatment for the two brown-patches is a matter to which I have given a little attention, and thus far I am strongly of the opinion that night watering is a preventive. There is a club in Delaware which waters its greens at night almost exclusively, and in 1923 they had not a single case of brown-patch. A green watered in the afternoon goes into the night in a condition which I believe is the most favorable for the development of brown-patch. My experience, although varied, has generally shown beneficial effects from heavy watering at 8 p. m., and I believe a green so watered throughout the season would suffer much less from little brown-patch than one watered in the day time.

"I favor watering every night in periods of heat and drouth. Such a practice not only keeps bent active and vigorous but also keeps out crab grass. Bent will grow and thrive in ditch bottoms, but crab grass will not. Having that in mind, I have always endeavored to keep greens well watered, and two years of such practice has convinced me of the wisdom of it. A green watered in the heat of the day never has the same sheen or luster on the turf that a really healthy green should have.

"Sprinkling at night is best for turf, and certainly best for the golfer, but watering facilities and costs are often the governing factors."

R. Avery Jones, Baltusrol Golf Club, Baltusrol, N. J.

"I am of the opinion that the best time to water putting greens is from 5:30 p. m. to dusk. A light preliminary sprinkling should be given, and this followed by a comparatively heavy sprinkling. There is less evaporation from watering in the late afternoon and evening than from watering in the day. The greens grow well through the night, and the water has sufficiently soaked in when the men arrive the next day for cutting. I am not averse to watering greens at any time of the day, provided it is done heavily enough when the sun is hot."—*Gordon Smith, Morris County Golf Club, Convent Station, N. J.*

"I concur in the opinion given above of our greenkeeper, Mr. Gordon Smith, with regard to practice in watering putting greens. With the prevalence of brown-patch, however, there may be some objection to watering in the evening, as I think this tends to promote its spread. Yet I know of one club which seems to have had considerable success with early morning watering, which washes away the scum which appears on the greens in the morning when brown-patch is prevalent."—*Wynant D. Vanderpool, Morris County Golf Club, Convent Station, N. J.*

"We have always found it advisable to water our greens in the evening or very early morning. This allows for a thorough soaking before the sun's rays strike the greens. If brown-patch is present, of course, we

recommend early morning watering, because of the results of experiments conducted by the Green Committee of the U. S. Golf Association.”—*J. K. Bole, Mayfield Country Club, South Euclid, Ohio.*

“It is my opinion that if I were free to do exactly as I wished, and had all the money and facilities necessary, I would water greens at night, for the reason that it is cooler then, there is less evaporation, and the greens have a better chance to get in good condition for play. The difficulty with this is that I have never seen any sprinkling equipment that distributes the water evenly, and I have never been able to find a man who could go around in the dark and place the equipment so that the water is fairly evenly distributed. After trying out all sorts of equipment, and after watering greens for years at night, we have come around to the belief that the most practical system is to water the greens by hand, as early as possible, the first thing in the morning. We prefer watering by hand with an ordinary spray nozzle, because by so doing we are able to water the greens evenly and to give them exactly the amount of water we think they should have. We have watered greens at all times of day and night, and as far as I can see it does not make much difference as long as the water is evenly distributed and the greens get the amount that is needed. We feel, however, that it is better to water at night or in the early morning rather than during the heat of the day, because the application of cold water in the heat of the day must give the vegetation more or less of a shock, and the rapid evaporation would not seem to be desirable. However, I do not believe that watering at one time or another can make any difference.”—*W. J. Rockefeller, Inverness Club, Toledo, Ohio.*

“We have always practised sprinkling the putting greens after 5 o’clock in the evening, and in very hot weather preferably after dark. My own judgment is that they could be sprinkled in the morning in the early hours, and that if sprinkled very early in extremely hot weather it might be better for them.”—*W. A. Alexander, Old Elm Club, Fort Sheridan, Ill.*

“At Minikahda we have always done our watering at night, as at any other time it interferes with the play. We have a man who goes on duty each night at 5 o’clock and waters until 2 o’clock in the morning, with an hour out for midnight lunch. He waters 9 greens each night, so that each green is watered thoroughly every other night. The results have been satisfactory.”—*Wm. F. Brooks, Minikahda Club, Minneapolis, Minn.*

“Heretofore we have been in the habit of watering our greens each night during the warm season, starting at about 5:30 or 6 o’clock, but during the season of 1924, due to a great deal of rain and much cooler weather, we watered the greens during the day time. Our greens have held up much better during the season of 1924 than ever before to my knowledge, but we attributed this to the weather rather than to any of our operation. The expense of watering at night is a little bit greater than in the day time, and the possibility of the men slacking on the work is much greater. However, the inconvenience to golf players is eliminated, which is quite a factor in keeping down complaints. I should perhaps add that I have not studied the problem of time of day for watering sufficiently closely to form any definite opinion in the matter.”—*G. W. Fowler, Glen Echo Country Club, Normandy, Mo.*

“We have only one kind of grass on our putting greens, and that is Bermuda grass, which is a grass which does not require much watering,

growing better with simply the natural rainfall. However, in exceedingly dry seasons we sometimes do some watering, and have always followed the plan of watering at night. This has been followed empirically. We have no particular reasons for following this plan, except that we believe we get less evaporation during the night, and therefore a larger benefit from the moisture. I do not believe that Bermuda grass would be readily damaged by watering in the day time."—*Thomas P. Hinman, Druid Hills Golf Club, Atlanta, Georgia.*

"We have found from the cultivation of Bermuda grass here that the best results are from watering after the heat of the day. After 6 o'clock is better than earlier. Our Bermuda greens are not watered lightly but soaked about once a week. This, with daily cutting and monthly top-dressing, keeps them in very fine shape."—*C. B. Buxton, Dallas Country Club, Dallas, Texas.*

"In my judgment the time to water putting greens is when the surface lacks moisture. It makes little difference whether it is done in the early morning, midday, afternoon, or night. When possible without interference with play, I prefer day watering, because the workmen can see better how to more evenly apply the water and thus attain better results. Modern undulating greens can not be watered evenly by the sprinkler alone, as the water runs off the high spots, which rarely get enough soaking, and the low spots get more than is desired. I like a watering system that has a 1½-inch pipe to every green outlet, capable of being reduced to two ¾-inch outlets, to one of which the sprinkler is attached and to the other the hand hose. With this system the workman can only take care of one green at a time; while the sprinkler is playing generally, the hand hose is applying water to the high spots only. In this way a green can be evenly and thoroughly watered in a much shorter time, and the sprinkler changed more often to prevent water standing or running on the surface, a condition which at no time should be allowed to exist, since it injures the surface and is a waste of water.

"I much prefer watering every day, to the generally accepted theory of watering two or three times a week. If after the soil is once deeply moistened, sufficient water is applied each day to take care of the surface evaporation, the moisture below will be held for a long time and the necessity for long, deep watering will be avoided. Grass does not require excessive moisture, but just sufficient to supply its needs, and it should have this daily. A moderately moist soil is far better for the healthy development of turf than wet, soggy ground. It should be remembered that the roots of the bent grasses are very shallow, not more than 2 inches deep, necessitating the presence of moisture in the ground at all times, though not in excessive amount."—*Walter S. Harban, Columbia Country Club, Washington, D. C.*

Fall and Winter Top-Dressing of Putting Greens

By R. A. OAKLEY.

If the questions that come to the Green Section at this time of the year may be taken as an indication, there is a very general feeling that putting greens, in the northeastern part of the United States, at least, need protection of some kind during the winter. The feeling is particularly prevalent in the case of newly planted or seeded greens. It is apparently thought that the turf grasses in putting green condition will succumb to the low

temperatures of winter or to the alternating freezing and thawing of spring unless something is done to protect them from these vicissitudes.

A good many observations have been made on the effects of winter weather on putting green turf and on the effect of covering greens for the winter months. The studies thus far conducted indicate quite clearly that there are relatively few cases where either the bents or fescues are appreciably damaged by winter factors except in situations where either the surface or sub-surface drainage is inadequate. Ice sheets may be formed even under conditions of good drainage, and these have been known to injure putting greens, but ice sheets thus formed produce injury so seldom that winter-killing may generally be regarded as a direct result of poor drainage.

In brief, the bent grasses and the fescues used on our putting greens are not tender grasses; on the contrary, they are winter-hardy. If it be assumed that winter injury to putting greens is due chiefly to poor drainage and not to low temperature, then a protective covering could have very little, if any, beneficial effect. In a great many cases where the effect of winter covering of greens has been noted, the results have been evident. In some cases the covering material, while of very good consistency, was applied so thickly that it smothered the grass. In other cases the material was not sufficiently comminuted or shredded, so that large lumps killed the grass upon which they lay, even though the application of the material was relatively light. In still other cases coarse material, such as straw or rush hay, was applied. This material packed down so closely on the turf that the grass was injured or killed by it. Then again, winter coverings are frequently allowed to remain on the turf until too late in the spring.

The verdict at this time is very distinctly against covering greens for winter protection; but this does not mean that top-dressing with suitable material late in the fall is not a beneficial practice. It is indeed a very beneficial practice if properly done. Naturally the question is asked, What is suitable material? There are several. Thoroughly rotted and comminuted manure is one; loam and sand are others; but the very best, all things considered, is a mixture of these three in proportions to suit the conditions of the grass and the soil of the surface of the green. Good thoroughly mixed compost composed of loam or clay loam, sand, and well-rotted manure, is the ideal material for top-dressing greens in the fall, and, as a matter of fact, at any other time of the year. The proportion of the various constituents is not a very definite matter, but ordinarily 20 per cent to 25 per cent, by volume, of organic matter is sufficient. More may be used advantageously if the grass is thin and the top soil of the green lacking in organic matter. If the soil is of a rather stiff clayey nature, equal parts of loam and sand afford the right proportions. If the soil of the green is very sandy, only enough sand should be added to the loam or manure to make the compost of such a consistency that it will work down well into the crown of the grass and will not form a sticky layer on the surface. A very satisfactory rate of applying such compost as a late fall dressing is 1 cubic yard to 3,000 to 5,000 square feet. The dressing should then be worked into the turf with a brush, flexible steel mat, or the back of a rake. Before applying the compost the green should be cut to regular putting height. If this is done there will be little likelihood of the grass making too great a growth before time for cutting in the spring.

Some experiments conducted at Arlington last year indicate that ammonium sulfate may be added to the late fall application of compost at

a rate to provide 3 pounds to each 1,000 square feet of green, and very beneficial effects result from this treatment. However, more definite experiments are needed before the practice can be recommended. Frequently sand alone is recommended as a late fall top-dressing on clay soil greens. Benefit may be obtained from such an application, but the evidence of carefully conducted tests indicates that sand with well-rotted organic matter and loam gives much better results than when applied alone as a top-dressing. Pure sand really does not mix well with the soil beneath but has a decided tendency to remain in a layer on the surface. Furthermore, most sand top-dressings do not leave as desirable a surface as do compost dressings, and unless sand is applied rather sparingly it has a tendency to retard the growth of the grass.

To those who wish suggestions relative to the treatment of greens here are some for consideration:

Remove noxious weeds at once.

If the greens are located south of the latitude of Philadelphia and these suggestions are received before October 15, top-dress with 1 cubic yard of compost to which is added 10 pounds of ammonium sulfate, the mixture to be applied to 5,000 square feet of green. Apply evenly and water in thoroughly. For all greens in the northeastern quarter of the United States, whether or not they have been top-dressed by the middle of October, an application of 1 cubic yard of compost to 3,000 to 5,000 square feet of surface is recommended as late as approximately December 1. The greens should be given no other treatment for the year, as far as top-dressing or covering is concerned, and if the drainage is what it should be they may be confidently expected to survive the winter in good condition.

QUESTIONS AND ANSWERS

All questions sent to the Green Committee 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 each month. 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 Committee.

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.

1. ANNUAL BLUEGRASS IN SOUTHERN PUTTING GREENS.—I am enclosing a small quantity of a foreign grass which is appearing in our greens in large volume. In some cases it covers the surface in patches, but in most cases grows in tufts at an interval of one or two inches, making the greens very bumpy and almost impossible to cut low enough to make a smooth putting surface. This grass appears in the early fall and is continuous throughout the winter, and is what is generally referred to here as winter grass. Last year there was very little of it in our greens, but this year, possibly by reason of our using some top-dressing which contained the weed seeds, it is present in all of the greens and creates a very serious situation. Of course, it is not difficult to pull it out by hand, but this would be a tedious job. It can also be removed by thorough scratching with a plank containing sharp nails. What treatment would you recommend for getting rid of it? (Texas.)

ANSWER.—The grass you send is *Poa annua*, or annual bluegrass,

which has been described on pages 39, 188, and 213 of the 1921 volume of *THE BULLETIN*. It is a winter grass and grows in abundance in most putting greens throughout the United States. In many sections it completely covers greens during the winter and early spring and makes a very good putting surface. Here at Washington it disappears only toward midsummer, being replaced by the bents. It is not regarded as objectionable in the latitude of Washington. Northward it seems to be more undesirable. It is reported to appear in patches on Bermuda greens at Atlanta, Georgia, and is objectionable because it does not make a continuous turf and makes the greens bumpy. It is a difficult grass to eradicate, and the only method that has been tried is hand-weeding, which is very expensive. This will have to be done very thoroughly, as the grass seeds almost next to the ground. It would also have to be weeded out or destroyed in the approaches to the greens, as of course it would readily spread from there to the greens again. We have tried the use of chemicals in various ways to kill the grass without injuring the other grasses, but have not had any real success.

2. "ATLANTA" AND OTHER STRAINS OF BERMUDA GRASS, AND THEIR SOURCE.—In the December, 1923, number of *THE BULLETIN*, on page 313, you make reference to "the discovery of the Atlanta strain of Bermuda grass." Through my interest in Bermuda grass for putting greens, I have endeavored to locate turf of the "Atlanta" strain at that place, but I learned there that all of the clubs at Atlanta purchase western-grown Bermuda grass seed, the same as all clubs through the South. I am wondering on what grounds your statement is made that an "Atlanta" strain of Bermuda grass has been discovered. Is it not a fact that on different soils and under different conditions, Bermuda grass necessarily assumes different forms? It is my experience that on poor soil Bermuda grass is of fine texture, and on rich soil it is of coarse texture. (Virginia.)

ANSWER.—Perhaps the choice of the name "Atlanta" for the strain of Bermuda grass to which we have reference, is unfortunate. It is undoubtedly true, as you state, that any one strain of Bermuda grass (and this is also true of other grasses) varies considerably in texture dependent upon the character of the soil in which it is growing. There are nevertheless many different strains of Bermuda grass, which display their differences on any kind of soil. We have grown as many as twelve different strains at different times on our experimental plots, and find that the strain to which we have given the name "Atlanta Bermuda Grass" is the best of all for putting greens. On any of the putting greens about Atlanta, or indeed in other places of the South, on clayey ground, it is very easy to detect two different strains of Bermuda. With respect to western-grown Bermuda grass seed, so far as we are able to learn (and we are fairly sure of it), both the Atlanta strain and the other strain are in the seed gathered in Arizona. In other words, this seed is not the seed of a single strain, but of at least two strains, one of which is vastly superior to the other and which we have been calling the "Atlanta" strain. Bermuda grass, like creeping bent grass, embraces a considerable number of strains, the characteristics of which persist perceptibly irrespective of the character of the soil and the conditions under which a strain is grown. The different strains of creeping bent grass that have been isolated, however, are greater in number than those of Bermuda grass.

3. TOP-DRESSING BERMUDA TURF.—We have been advised by different authorities to top-dress our Bermuda greens with nothing but sand, notwithstanding the contrary advice which has appeared in *THE BULLETIN*. When our greens were constructed, three of them had a 3-inch layer of plain muck and the rest plain glades marl or potash marl. We have been top-dressing with 25 per cent muck and the

rest marl, with a small portion of black hammock sand or leaf mold, which is very satisfactory, except for the muck, which forms small pills and is slow to disintegrate. The last top-dressing we applied was a marl hauled from quite a distance, which is of a more clay-like consistency and which we believe will be better. We should like to have your advice in the matter. (Florida.)

ANSWER.—We would not use sand for top-dressing Bermuda turf. We would advise you to use your marl soil, with good humus (and you will have to use your own judgment as to what is good humus), not to exceed 20 per cent mixed with it. If part of the humus can be barnyard manure it will be still better, as this puts life in the soil. Your finished mixture should be of such a consistency that it will rattle down into the turf like sand or sandy loam and fill in the hollows. Good Bermuda turf wants a firm soil. We have never seen first-class Bermuda turf on sandy soil.

4. TURF GRASSES FOR FLORIDA.—Our soil is a rich dark hammock soil, and we should be glad to know what grasses you would recommend for use on a golf course we are building here. (Florida.)

ANSWER.—If you are on the ordinary flatwoods type of land the best grass to seed on your fairways is carpet grass. It is possible also that the land is such that it will grow Bermuda grass, and it might be well to seed your fairways to a mixture of four parts carpet grass and one part Bermuda grass. You should endeavor to plant your putting greens with runners of Atlanta Bermuda grass. To obtain sufficient runners for the purpose, you will first have to start the grass in a nursery.

5. CHEMICAL FERTILIZERS AS COMPARED IN VALUE WITH ORGANIC FERTILIZERS; COTTONSEED MEAL AS A FERTILIZER.—Our course is in play from January 1 to April 15 only. During the rest of the year we keep our fairways mowed so as to prevent the growth of weeds, but aim not to produce a vigorous growth of grass, since it would necessitate extra expense for mowing during the period April 15 to January 1. It has therefore been our custom during this period to fertilize the fairways with sheep manure, as we understand this has a long-sustained but mild fertilizing action. Last year we were able to purchase sheep manure for \$25 a ton, but this year can not get it for less than \$35, which we think is out of proportion to its value. We can buy bone meal for \$36 a ton. Most of our soil is light and sandy, and we have accordingly been working on the theory that it is better to use organic fertilizers, in order to give the soil more body. We are aware that more nitrogen can be obtained from chemical fertilizers, such as ammonium sulfate and sodium nitrate, for the money expended in purchasing them, but believe that these fertilizers would simply serve to promote a vigorous growth of grass if used on the fairways during the summer period, and at the same time leach out of the soil before the playing season starts. How would it do to fertilize the fairways in May and September with 500 pounds of bone meal per acre, and with ammonium sulfate in December, just before the playing season starts, in order to stimulate a quick growth of the grass at that particular time? (Florida.)

ANSWER.—Under your conditions you are quite right in following the practice of using mainly organic fertilizers, chiefly bone meal. In our experience sheep manure is very expensive, measured by the results it gives. Bone meal is about the best of all organic fertilizers, and probably the cheapest in the long run. It is possible that under your conditions cottonseed meal is even cheaper; and it is an excellent fertilizer for grass. It seems to us that your policy should be to fertilize your fairways with bone meal or some other organic fertilizer early in the fall, and just before the playing season starts use ammonium sulfate or sodium nitrate for quick results. This is virtually your program, except that we do not see any value in your fer-

tilizing the fairways in May unless it should appear that the growth of the grass becomes so weak as to indicate its probable dying. The fall application is however the most important. Other valuable organic fertilizers are fish scrap, tankage, and blood meal. If you have not used cottonseed meal we would advise you to apply it rather carefully, as during hot weather it is apt to scorch the grass if used in quantities in excess of 15 pounds to 1,000 square feet.

6. SOIL PREPARATION FOR PUTTING GREENS AND FAIRWAYS; USE OF RYE, COWPEAS, AND SOYBEANS IN PREPARING LAND FOR TURF GROWING.—We have acquired additional land for the construction of nine more holes. Much of this land is abandoned farm land and some of it is pretty well grown up. The soil is for the most part a sandy loam, and is well drained. We should like to have your comments on our plans for preparing this land, which are as follows: The parts intended for the fairways we propose to plow and thoroughly clean this spring and summer of stumps, roots, stones, and other debris, putting the land in good condition for seeding this fall to rye. The following spring we shall turn the rye under and seed to cowpeas and soybeans, these in turn to be plowed under in the late summer for seeding to the permanent grasses. As for the greens, we are contemplating building up the subsurface of the soil with 6 or 8 inches of our top soil mixed with a liberal amount of well-rotted manure. Upon this we shall spread a thin layer of compost, then spread the creeping bent stolons, then spread a thin layer of compost upon the stolons, and finally roll and keep well watered. (New Jersey.)

ANSWER.—With regard to your fairways, we believe you will obtain good results by clearing the land this summer and sowing in the fall to rye, but after you turn the rye under next spring we would advise you to let the land lie idle until you are ready to sow the grass seed in the fall. An important thing in getting good turf is first to have a good seed bed. Plowing the ground twice next summer, the second time after a crop of cowpeas or soybeans, would leave the ground so loose that you might have difficulty in getting it to settle for a good seed bed. After the rye is turned under, however, the ground should be worked occasionally in order to keep down weeds and get the soil in good tilth. It should then be in good condition by the latter part of August or the first of September, which is the time when you should sow it to your permanent grass. If you could get some good manure to plow under this summer before sowing the rye, it would help materially. Care should be used also to plow the rye under sufficiently early next spring so that it will decompose thoroughly before you are ready to seed to grass.

As for your putting greens, we would suggest that instead of going to the expense of building up the surface with 6 or 8 inches of top soil mixed with well-rotted manure, you save most of the manure for the construction of compost heaps for future use on the greens after the turf is established. We have evidence which indicates that stolons will make excellent greens if planted on ordinary loam or clay loam, provided good top soil or compost is available for top-dressing afterward. At Arlington Experiment Farm, our best plats of bent are those which have as a base a well-drained stiff clay, and upon which top-dressings of compost have been applied rather frequently. On 4-year old turf the depth of the top-dressings has reached approximately 1½ inches. Top-dressings may be applied with good results every thirty or forty days during the growing season. One cubic yard of compost is a fairly good quantity to apply to 5,000 square feet of green at one time. This works in well and does not interfere with play for any considerable length of time.

In brief, your plan should be to obtain a good, well-fertilized seed bed for your fairways before sowing the seed, on account of the expense that would be involved in attempting to improve the turf on such large areas afterward; whereas with the putting greens, the growth of the grass may readily be controlled at any time, provided a good compost is available for use as top-dressing.

7. SEEDING, AS A POSSIBLE ADJUNCT TO STOLON PLANTING, IN THE VEGETATIVE PLANTING OF BENT GREENS.—During the past thirty days (August) three of our greens have been plowed up and creeping bent stolons have been planted in the manner recommended at various times by you through the columns of THE BULLETIN. In addition to an attempt at straight vegetative propagation, a liberal quantity of seed was planted at the same time. We naturally presumed that since creeping bent stolons were being planted, our people had supplemented this propagation with seed of Rhode Island or Colonial bent, or possibly South German mixed bent. However, upon inquiry we found that the seed for supplemental planting is Chewings' fescue. This policy appearing to us to be inconsistent, we ventured to inquire of one of the green committeemen why they used fescue and not bent seed. His reply was that the commercial bent seed (he mentioned German mixed bent) was very expensive, would cost about \$2.00 per pound, and possessed but a small percentage of viability. We are, however, not satisfied that it is a wise policy to supplement the vegetative propagation with a seed of an entirely different grass, unless there appeared an emergency requiring quick and sure results, in which case we would supplement with redtop and let the other take its place eventually, which it naturally should do. If, however, we deemed it necessary or advisable to plant seed in addition to stolons, in this case we think we would favor using bent seed only, as there is no emergency, and we can not hope to use these greens before next June or thereabouts. If it were a question of the cost of seed we would limit the quantity per green to fit our finances. Colonial bent would be our choice. These particular greens have been plowed up and replanted once yearly during the past three years, and we are anxious to know if we are on the right track now. (Ohio.)

ANSWER.—When a green is planted properly by the vegetative method we do not advise that any seed be sown. If, however, it is desired to sow seed, bent seed had best be used. Perhaps it is fortunate that your committee used red fescue. Fescue has no chance in persisting with the bents. This is true even when the seeds of the two are mixed. We do not see therefore that you need to be concerned about the results. The only unfortunate thing is that the money your club invested in fescue seed is wasted.

8. YARROW IN SOUTH GERMAN MIXED BENT SEED.—Do mixed bent seeds all carry a certain amount of yarrow? We find in our new greens sown with mixed bent quite a quantity of yarrow. We have read the articles on yarrow in THE BULLETIN and are not greatly alarmed by its presence but would like to know if all bent seeds carry a certain amount of yarrow. (Pennsylvania.)

ANSWER.—Yarrow very commonly comes in impurities in the South German mixed bent seed. Some samples received during the past year contain much higher amounts than formerly, and some clubs have complained of the large amount of yarrow which appeared. Yarrow makes really quite a satisfactory turf—that is, mixed with grasses—but we have failed utterly to get satisfactory turf from yarrow alone. In our opinion you should not feel at all concerned about it. While perhaps not the most desirable thing in the world in putting turf, yarrow is really not undesirable.

9. GRASSES FOR FAIRWAYS ON SAND HILLS.—We are desirous of turning a number of sand hills on our course into fairways. What grass can we sow on this

sand? Anything that will take hold will be satisfactory for the time being. (Michigan.)

ANSWER.—Red fescue and sheep's fescue will grow on poor sandy soils, but they make a cuppy turf and are much better for the rough than for fairways, and we doubt that you would care to use the latter, especially in your fairways. If the land is very sandy it would be well to include a light seeding of rye also. Your best grasses, if you can get them to take hold, are, in order named, Rhode Island bent and Kentucky bluegrass, and it would certainly pay you to include some white clover. Another thing that would be advantageous, if at all practicable, would be to top-dress with sufficient good soil so that the better fairway turf grasses will grow.

10. FERTILIZERS FOR NEWLY-PLANTED CREEPING BENT STOLONS.—What fertilizer would you advise mixing with top soil that is fairly rich at the time of planting creeping bent stolons? (New York.)

ANSWER.—We would advise the use of bone meal or stable manure. We think it best to dispense with the use of quick-acting fertilizers, such as ammonium sulfate, until plants from the stolons have made good growth.

11. UTILIZING STRAW IN THE IMPROVEMENT OF SOIL.—What treatment of straw do you recommend for making it of value in fertilizing and improving the mechanical condition of soil? (Indiana.)

ANSWER.—We would recommend that it be composted for a year with manure and soil. The decomposition of the straw can be hastened by adding approximately 100 pounds of sodium nitrate or ammonium sulfate to a ton, dry weight, of vegetable matter, and then composting this with the manure and soil, and keeping the pile moist.

12. BENT GRASS IN MIXTURE WITH BERMUDA GRASS.—Is it possible to grow bent grass in a heavily-matted Bermuda-grass green? Will the Bermuda grass choke out the bent? (California.)

ANSWER.—We do not believe that bent grass will survive in Bermuda-grass turf under your conditions.

13. RIDDING A POND OF VEGETATION.—Have you any information on the eradication of cattails? We have an area of swamp land on our course which we would like to convert into a lake if we can rid it of the cattails. On page 130 of the 1921 volume of THE BULLETIN you publish a formula for "chemical methods for destroying all vegetation." Would the use of these chemicals be practicable? (Virginia.)

ANSWER.—The only practicable method we know of for eradicating plants in swamps is the building of a dam to raise the height of the water a foot or so. This will generally kill out the vegetation. As new plants become established they can be eradicated by lowering the depth of the water to the original level. It would be very expensive to resort to the use of chemicals for killing vegetation in a pond of considerable area.

14. KELP AND OTHER SEA WEEDS AS A SOURCE OF HUMUS.—Our course is near the seashore, whence a large supply of kelp and other sea weeds is available for our use. Do you know of any objection that could be raised to our using such material in our compost piles? (Massachusetts.)

ANSWER.—Such material may be advantageously used in compost piles. The decomposition of the material can be hastened by mixing manure and soil into the compost pile, with the addition of ammonium sulfate. We advise that the humus content of the compost pile (that is, the sea weed and manure) should not exceed one-fourth of the whole, the balance being soil.

Meditations of a Peripatetic Golfer

On a flat terrain, cops of various forms, rather than pits, should be used to make the landscape more pleasing.

There are about six thousand species of grasses known to botanists. The average golfer thinks there is only one kind.

What is a golf course, anyway? It is well to decide in advance whether you want it to be a fair and trying test of skill—or merely a pleasant park in which to follow the vagaries of an unruly ball.

When the course is crowded with players, it is better to change the cups twice a day, rather than once in two days.

Golf spelled backwards is "flog." Flog the ball all you want, but spare the turf, my boy!

Some golf architects seem to prefer to hide their architecture by building blind holes, blind bunkers, etc. All hidden architecture is bad; and perhaps this is the reason its creators like it concealed.

The Nebuchadnezzar Golf Club asks its members to refrain from eating the grass.

"Art is long and time is fleeting." If time keeps on fleeting, another hundred years should reveal that it takes a real artist to make a golf course that is a thing of beauty.

Ninety-eight and seven-tenths per cent of all approach shots, including putts, are short, according to a statistical fiend. This is one of the many slips 'twixt the cup and the ball.

When the ball hops along the putting green, it is cuppy. It can best be corrected by top-dressing with a compost that will filter into the hollows.

A new golf course with all the greens, all the tees, and the fairways vegetatively planted! This marvelous development is near Philadelphia—which is not so slow after all.

Starving the turf to make it tough is the most hopeless of all theories of greenkeeping.

The Green Section may make mistakes, but unless you have positive evidence to the contrary, you had better follow its counsel. Don't let old prejudices keep you from using new and better methods.