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A MONTHLY PERIODICAL TO PROMOTE THE BETTERMENT OF GOLF COURSES

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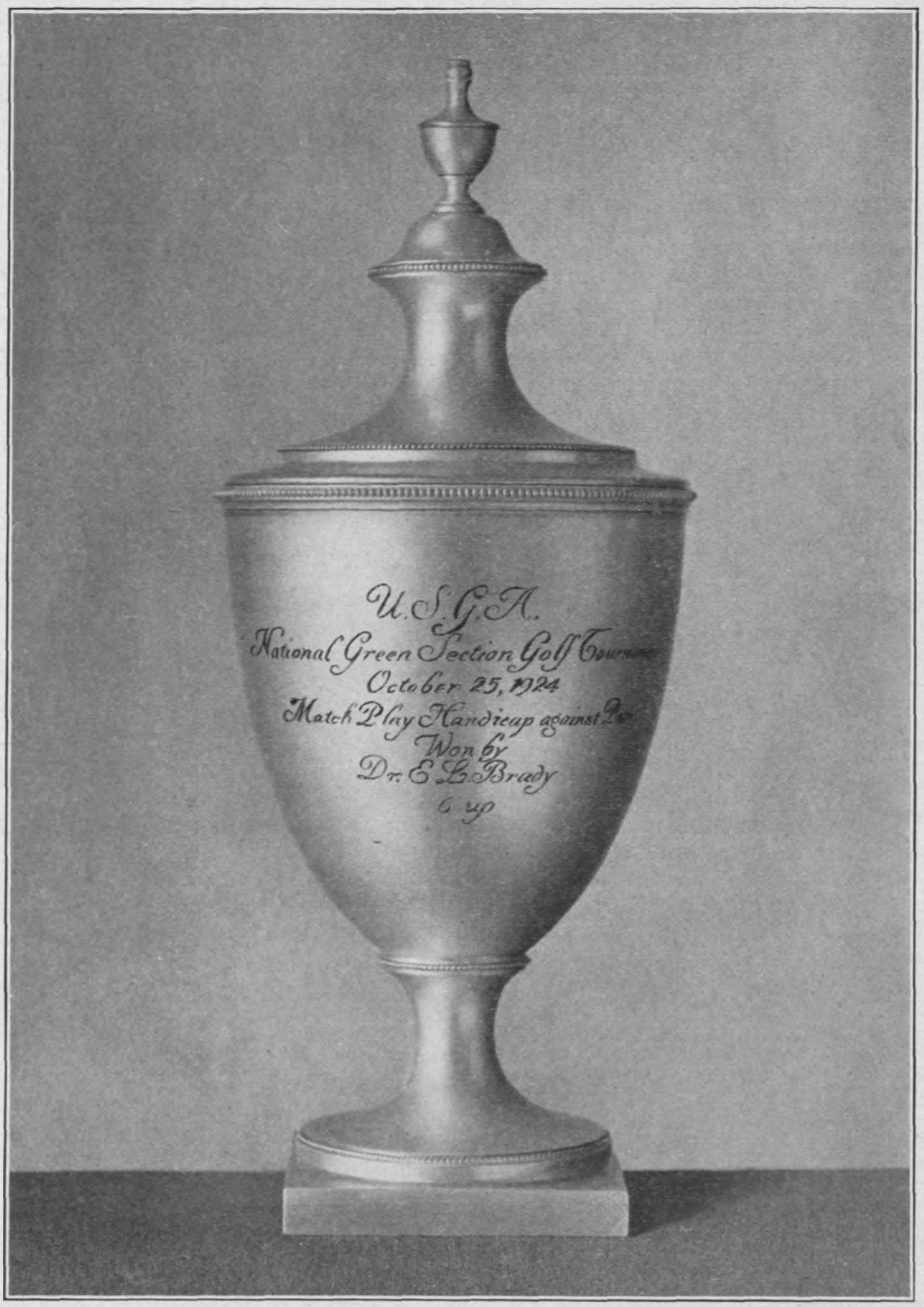

Green Section Golf Tournament Trophy
Reproduced by Tiffany, New York City, after Old English Design.

Applying Ammonium Sulfate

By W. J. Rockefeller, Inverness Club, Toledo, Ohio

Ammonium sulfate has become very popular for fertilizing putting greens, but the methods of application are diverse. While the burning of the green does not seem to do any permanent injury, it spoils the appearance of the green for a week or ten days, which is not desirable. Sowing the granulated ammonium sulfate directly on the green has been tried, also sowing on top of top-dressing before brushing out, but both methods are dangerous as help will be careless. Mixing the ammonium sulfate with three or four times its bulk of sand is better, but there is always the danger of a careless workman dropping a handful in one place, and you almost invariably get a burned spot. When sowing on top of an application of top-dressing, brushing and watering thoroughly at once, it works fine.

We find the safe way is with sprinkling cans. We take one-half the amount we wish to apply to a green and dissolve it in 50 gallons of water. We put this solution on with sprinkling cans, the men walking slowly backward across the green, swinging the can from right to left, and covering the green with the 50 gallons. We then use the other half portion of ammonium sulfate in a like manner, only crossing the green in the opposite direction. We then water the green well by hand with a hose. We have little or no damage by burning with this method, regardless of a little carelessness by the men. The cost of application is only slightly more than the sand method, and we think the extra cost is money well spent.

A letter of appreciation from Dr. E. L. Brady, Marion Country Club, Marion, Ohio, one of the two tieing winners of the National Green Section Golf Trophy last October.

December 13, 1924.

Dear Mr. Vanderpool:

Your letter of November 28 notifying me of my championship in the National Green Section Tournament, came as a most pleasant surprise. I wish to thank you for the beautiful trophy, which I received a few days ago. It makes me feel that my few efforts at golf last season were not all in vain. I am anxiously waiting the opening of the coming golf season, in which I hope to improve my score a great deal. Last year being my first attempt at golfing, I feel that I still have a good deal to learn and that there is lots of room for improvement.

Thanking you once more for the lovely trophy, I remain,

Very truly yours,

E. L. BRADY.

A cut of the trophy cup is shown on the opposite page.

The Tournament was held throughout the United States and Canada on October 25, 1924, handicap match play against par.

Dr. Brady and Mr. John J. Hane, both of Marion Country Club, were the winners of the trophy, tieing 6 up on par.

The Marion Country Club course is 9 holes, par being 75 and yardage 3,467. Dr. Brady's score was gross 90, net handicap 23=67. Mr. Hane's score was gross 87, net handicap 23=64.

Building a Nine-Hole Course for Four Thousand Dollars

By Maynard M. Metcalf

In 1897 the Oberlin Golf Club,[1] without formal organization, began play on a rented pasture of 30 acres without specially constructed putting greens. Some seeding and fertilizing of putting greens was done in succeeding years, but no general construction work was undertaken until the fall of 1922. For several years one of the members of the club had studied the problem of layout and construction of a new course, having visited and taken extensive notes upon more than forty courses, where he found many suggestions applicable to the conditions at Oberlin. The Board of Stewards of the club was induced to inspect different pieces of land around Oberlin with a view to finding the best available location. Price, natural fitness, and accessibility finally led to recommending the purchase of part (18 acres) of the original pasture which had been long in use for the course, and to this was added adjacent land as follows: Ten acres loaned without cost by Oberlin College; 6 acres loaned without cost by a railroad; 2½ acres rented from a railroad company. Thus 36½ acres were acquired, of which only 18 have been purchased. About half the course lies within the village limits. It is appropriately located (as some scoffers think) just short of the cemetery. A creek, and three small drainage channels converted into ditches, cross the course and give variety of contours and hazards of much value. A dozen fine trees in the rough emphasize fairway boundaries. And two fine pieces of woods at the edge of the course add to its beauty, especially by their spring and fall coloring.

In the spring of 1922 complete plans for a 9-hole course upon the land described were presented to the club and the following fall were unanimously approved. The one who planned the course was elected to have charge of building it. A period of ten working months was required to complete the construction work, during eight months of this period the work being under the daily supervision of the club member in charge of the construction. We now[2] have a 2,900-yard 9-hole course, built and seeded, and ready for play as soon as the greens and seeded fairways have completed their next spring's growth. We hope and believe that, though short, it will be as good a 9-hole course as there is in Ohio. It gives as good variety of play, calling for as many types of shot, both for distance and manner of play, as can well be had in 9 holes. The course has the advantage of lying adjacent to sufficient land of suitable contours to allow extension to 18 holes should this in time become desirable.

Before construction was started, the plans, in final form, were submitted on paper to several professionals of known good judgment. One professional went over the ground, plans in hand; and another good golfer who for many years had been chairman of the green committee of one of the best two courses in the State, went over the plans in detail upon the ground. After receiving full approval of the original plans from all these consultants, work was started in October, 1922, immediately after the club's authorization was given.

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[1]The Oberlin club is one of the oldest, perhaps the oldest, golf club in Ohio. Its grounds have been used for golf longer than any other grounds in the State.

[2]October, 1923. An unusually favorable spring and summer have produced good turf on both greens and fairways.

Plans for the new course were made solely with reference to the land and its contours, none of the old greens or tees being used in the new course. It fortunately happened, however, that all but two of the old greens and all but one of the old tees could continue in use while the new course was under construction. Two temporary greens and one tee had to be provided.

The work done was approximately as follows: about 10 acres of new fairway prepared and seeded; ½-acre of woods cleared; 9 new greens built, with reseeded fairway (plowed and graded) around each green; 7 tees built where special construction was necessary; 4,435 feet of water pipe laid; 900 linear feet of ridges built, and these and 5 tees sodded; 3,600 feet of tile laid; 2,000 feet of wire fence erected. In the course of the work, 1,200 to 1,400 cubic yards of earth were moved, 124 yards being hauled by wagon about half a mile and the balance being moved by scraper an average distance of about 75 feet.

The cost of this work was as follows:

Total labor	$2,336.58
Water pipe and fittings (2-inch mains with 1½-inch, 1-inch, and ¾-inch side lines)	796.95
Seed	451.13
Manure	241.75
Chemical fertilizer	9.50
Tile	78.18
Fence material	20.79
	$3,934.88

The centers of the 9 greens, which are about 50 feet in diameter, are of creeping bent, which was planted with stolons. We expect the creeping bent to spread outward and thus enlarge the bent portions of the greens each year. Around these bent greens are wide areas graded and newly seeded with Kentucky bluegrass and redtop. The old fairways are mostly of bluegrass; those newly seeded, of Kentucky bluegrass and redtop. The creeping bent nursery cost only about $41.50, of which $32 was for labor and the balance for fertilizer, the stock for planting being given to us by the Inverness Club, of Toledo. We purchased our water pipe at wholesale prices ($940 worth for $613.78), and all fittings, hose, and sprinklers also at a reduction. The fence material cost little, as we used mostly posts from our own cleared woods, and abandoned telegraph wire from the railroad lines alongside the course. We are using 1-inch-mesh chicken wire to keep balls and players off newly-planted ground, and this wire will later be used to keep badly-hooked balls out of bad ground in two places where balls would otherwise be lost. Our tee boxes[1] are terra cotta chimney-flue linings, 8 by 12 inches in cross-section. Our three manure pits[2] for collecting manure water, instead of being made of concrete are dug in hard clay at very little expense. Our water pipe is laid but one plow furrow deep, and drains to five low points, where unions are disconnected each winter. Where possible our tees are but well-fertilized areas of fairway. Our tee boxes, manure pits, pipe laying, and fairway tees are better and less expensive than the ordinary kinds. With all this economy we have not sacrificed value for cheapness.

[1]Described on page 261, October, 1923, Bulletin.
[2]Described on page 275, November, 1923, Bulletin.

The total cost of the course is $8,000, of which $4,000 is for the 18 acres of land purchased and a like amount for construction.

The construction costs are of interest. Advance estimates made by experts from the plans and inspection of the ground, varied from $12,000 to $19,000. The member in charge of the work estimated $3,000 or less. The $1,000 excess over his estimate was occasioned by rising cost of labor over 1922 wages ($426.46), additional work undertaken ($267.14), and unfavorable seasonal conditions for turf growing and for the growth of stolons in the bent nursery, necessitating repreparing and reseeding 8 acres of fairway ($383.84) and cleaning harvested stolons from clover which got a start of the bent in the nursery ($180.00), these items involving a total expenditure of $1,257.44. April and May were unprecedentedly cold and dry, so that grass seeded the fall before had not made sufficient growth to withstand the hot days late in June and in July.

For this work, correctly estimated in advance by the club member in charge at $3,000 or less, advance estimates by experts after study of the plans and the land, were, as above stated, from $12,000 to $19,000, and if the work had been done by contract some such sum would have been the cost. Why such discrepancy? Here lies the chief point of this article. We did the work under our own supervision. The club member in charge of the construction was on the job every day when work was going on except during July and August, and the work during those months was chiefly clearing woods and putting up fences. A number of the members worked with the laborers, especially on the stolon nursery and in planting the greens. The water pipe was laid by common labor under the direction of the member in charge. The fellowship in labor created a good feeling among the workmen that led to honest work, and the close and constant supervision prevented any of the work having to be done over again.

So far as yet detected, only two mistakes were made, one in a bit of grading, necessitating tiling, regrading, and replanting ⅛ of one green, and the other in placing the tiling of one green too near the surface. This latter work was done during the summer when there was no supervision, and the error was not discovered until after the green had been planted; it has been allowed to stand, with what final result remains to be seen.

It is, of course, risky business to lay out a course without the services of an architect. Notwithstanding the fact that in our case the results are said to be good, the writer would not recommend the practice. Such good results as have been obtained are probably due to the thorough inspection in advance, by the one who directed the work, of all sorts of courses, and to several years of planning by him with reference to our own course. Building without a contractor, or at least without a foreman experienced in such work, is also risky. It would not be successful unless the one in charge had studied the theoretical side of golf course construction and had studied courses that exemplify both good and bad construction. And, by the way, some of the most noted courses show some of the worst examples of bad construction. The one who had charge of the Oberlin work would not have undertaken it had there not been available advice from the Green Section of the United States Golf Association through its BULLETIN and through its officers in person.

Let me repeat. Cooperation of the membership in the actual labor of construction, and daily supervision by the one in charge, mean a saving of a large portion of the ordinary expenses, by promoting a good spirit among the workmen and forestalling costly mistakes.

Another important point is, that keeping initiation fee and annual dues low makes the course in effect almost a public course, so that it is easy to get material at cost and to secure cooperation of all those who can be of any help.

Nothing has yet been said about a club house. Oberlin has none, and does not plan to have one of the ordinary sort. Her course is so near the center of town, and in this college town there are so many social organizations, that a golf club house of the usual sort is not required. There is under consideration a plan to secure a house that will serve as the greenkeeper's residence and will provide the club members with two locker rooms with showers, a lounging room, and a porch, and that will permit, if desired, the selling of soft drinks and light lunches by the greenkeeper's wife. The total cost of this to the club would not exceed $5,000, and under one scheme probably only $2,500. Oberlin wants golf, and not a private hotel with an annual deficit saddled upon the players. If we get a club house it will be very modest and will pay for its upkeep through the rent the greenkeeper will pay.

A word with regard to our financing may perhaps be of interest. We get our course for $8,000 for land and construction. We have 400 shares of authorized stock, par value $25 each. Of these we have sold 150, which will bring in $3,750 when all partial payments are made. Beginning with 1924, it is possible that a premium will be charged, which will likely advance from year to year as the condition of the course improves. Before long it will probably cost $50 to get into the club. Admission to the club costs one share of stock. Previous to 1917 annual dues were $15, and the membership was small. That year the dues were lowered to $10, and since then the membership has increased sevenfold, but not chiefly on account of low dues. Next year dues will probably be $15 plus war tax, and thereafter $20 plus war tax. On the latter basis our annual income and expenses should be as follows:

Income		Expenses	
125 active members @ $20	$2,500	Greenkeeper (8 months)	$1,000
35 associate members (family, but not over 21 years) @ $10	350	Helper	300
25 junior members (children of members, under 15 years, restricted privileges) @ $10	250	Manure	100
35 transient members (non-resident, mostly students, 3 months, no stock) @ $10	350	Gas, oil and repairs	250
Day players (introduced) @ $1	100	Water	65
House rent (greenkeeper's)	200	Interest (land contract at 4 per cent to purchase and bank debt at 6 per cent in 4 years)	396
Benefit entertainment	100	Taxes	50
		Incidentals	200
	$3,850		$2,361

With the surplus of $1,489 here indicated we could pay at least $1,000 a year on our indebtedness.

We believe that without an ordinary club house we can supply good golf on a thoroughly well-kept first-class 9-hole course, to 200

or more persons, at an annual expense of not more than the fees named above for each class of players. If Britain can give good golf on 18-hole courses for five or six guineas, we can give it in Oberlin on a 9-hole course for twenty dollars.

The Use of Bromcresol Purple in Testing Soil for Acidity

It has long been known that soils noticeably acid in character will produce good turf of bent, fescue, and certain other grasses, and at the same time will be unfavorable for the invasion of commonly troublesome turf weeds. This fact has frequently been brought to the attention of readers of THE BULLETIN, particularly in the discussion of means of controlling chickweed, white clover, and crab grass in bent greens. For the production of the desirable degree of soil acidity and at the same time providing suitable fertilizer for thin turf, the use of ammonium sulfate has been recommended. The question has at once arisen, How can one tell whether he is making progress in the acidifying of his soil for the discouragement of the growth of weeds?

To a chemist this is an easy problem, but not so to a greenkeeper. We are indebted to Dr. Edgar T. Wherry, of the Bureau of Chemistry, United States Department of Agriculture, for the working out of the following simple method by which soil may easily be tested for the desirable degree of acidity, by the use of bromcresol purple, a dye which may readily be secured through any dealer in chemicals.

First get one ounce of a 1 per cent solution of bromcresol purple. Then obtain some distilled water and wash thoroughly in it all of the utensils which will be used in the test until they are free from lime or other alkalies. The presence of alkalies on the utensils will necessarily lead to erroneous results in the testing of your soil sample for acidity. In place of distilled water, clean rain water will answer very well. Hard water should be used in no case, on account of the mineral salts it contains.

Place about one-half ounce of the soil to be tested, in a wide-mouth bottle or small jar, and to this add about two ounces of the distilled water or clean rain water. Mix the soil and the water thoroughly, by shaking or stirring, care being first taken to wash thoroughly the jar and the stirring utensil in the distilled water or rain water. Let the mixture settle for several hours. With a medicine dropper or small glass tube, which likewise has first been washed, withdraw five or ten drops of the clearest portion of the watery extract, and place these drops on a white dish after it has likewise been cleansed.

With the medicine dropper or glass tube add some of the solution of bromcresol purple to the watery extract in the dish, a small drop at a time, mixing after each addition, until the liquid becomes distinctly colored. The addition of large amounts of solution must be carefully avoided.

If the mixture of soil extract and the solution of the bromcresol purple assumes a purple or dull brownish color, the acidity of your soil is not great enough to keep your bent greens free from weeds. Applications of ammonium sulfate to the soil should then be resorted

to. After such applications the soil should be tested again at intervals. When finally the mixture of soil extract and the solution of bromcresol purple yields a clear and bright yellow color, the soil has reached a degree of acidity which is usually injurious to the weeds commonly troublesome in bent greens, and beneficial to the bent.

It must be borne in mind that soil which is not acid naturally, will tend to return to its natural non-acid condition, and that therefore continued applications of ammonium sulfate must be made, as needed, in order to keep the soil in a desirably acid condition.

The Value of Well-Kept Approach Areas

By Irving Hill, Lawrence (Kansas) Country Club

While it is true that every green committee must draw a line somewhere around each green to indicate a limit for spending money on the upkeep of the green, it should not be overlooked that in the end it is actually more economical to be liberal in the drawing of this line than to attempt to effect savings by restricting the area of upkeep for the green within too narrow bounds. Furthermore, what is more offensive to the eye or distasteful to the player than to approach a green encircled with coarse turf, bare spots, piles of rubbish, rock, bushes, tile ends, exposed pipe, fittings, hose, or what not? On our own 9-hole course, where we maintain fairly good bluegrass fairways and putting greens on an appropriation of $3,600 a year, the tendency is to draw this line of upkeep at the edge of the putting surface itself, which encourages and tolerates not a few evils. As a matter of fact, if that line were drawn to include the area about the green within which a player is entitled to try for a chip shot to the hole, it would really prove more economical and certainly more satisfactory.

As a player draws near the hole, the character and frequency of play becomes concentrated. Balls and players cross a line, which means a change of clubs for the player and of tools for the greenkeeper. By evening up the bumps and draws usual in these approach areas, the fairway mower can then come in close, thus enabling the greenkeeper to fix a line, depending on the size of his green and the slope of the hump, so that there will be no middle-ground or dividing line between the fairway mower and the green mower. This line is simply a cutting line for the two kinds of mowers. A common mistake is to use it for a limit line of top-dressing, surfacing, raking, smoothing, weeding, and watering. Siftings are disposed of on or near it. Instead of mowing one to four times around the green to make the turn of cross mowing vary, the mower is turned and manipulated always along that line. That makes bare spots. Water erosion enters the edge of the green. This means additional work and care. There are cuppy lies and subsequent divots.

Fertilizer from the green makes the fairway grass grow unevenly along that line. Fertilized spots grow tall, while other spots remain short. Moreover, crab grass and weeds are only too frequently allowed to run wild in these bunches of long and short grass, making the doorway to the green look unkempt and being unfair and uneven to the ball. Especially in the most-played entrance to the green is it necessary that the weeding, smoothing, and fertilizing be

extended several feet into the fairway. In case a green is already too large, the same results can easily be obtained by moving the cutting line inward. And this also applies to the edges of traps as well as the edges of greens.

In brief, why can not one line be established for cutting, and then back of that a line established to which the work will be carried on, so that the turf on both sides of this mow line dividing the fairway from the green will be free from defects against a well-played ball? The smooth, close, clean putting turf of the green would then have a frame or setting, which would make a good finish for the labor expended on the green. Such an area once established back from the line of the green will mean weed seeds farther removed and less expense for maintenance and will at the same time be more fair to the player.

Boost the Green Section!

If you know a golf club which is not a member of the Green Section, give us its name and address, so that we may write to it.

Every golf club in the United States and Canada should join in our movement for better turf and more economical turf management.

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

QUESTION.—If a player in a hazard is by actual measurement closer to the flag than his opponent, who is on the green, who should play first? The definition of a putting green is "all ground within twenty yards of the flag, except hazards." In my opinion even though a person is nearer the flag, if he is in a hazard, he is deemed not to be on the green at all and should play first.

ANSWER.—Whichever ball is farther from the flag must be played first, regardless of whether that ball lies in a hazard or not. See Rule 7.

QUESTION.—Is it at any time permissible to tee a ball one or two clubs' lengths in front of the markers? During a recent pro tournament one player teed his ball two clubs' length in front of the markers on several tees. It so happened that on several tees the markers were so far back that a player could not obtain a full swing owing to obstacles in the rear of him. On the first tee, for instance, an iron rail was only about 1½ clubs' lengths in the rear of the markers. The players were sent out in pairs together with a referee. The player above referred to declared he was allowed to tee in front of the markers, and the referee permitted him to do so. This information, however, was not conveyed to the other contestants.

ANSWER.—The markers placed on the teeing ground designate the limits of the course to be played. A player has no right to tee his ball in front of the disks. In medal play, the ball must be re-teed and played over again with a penalty stroke. In match play, the opponent has the option of recalling the drive if he so wishes. It is the duty of the local committee to see that the disks are so placed that ample room will be allowed for a free swing. No player has a right to tee a ball in front of a disk in medal play without having the penalty imposed as described above, otherwise he will be disqualified.

Length of Holes in Relation to Par

Some inquiries have been received from clubs with regard to the correct par for holes of various length. Directions for computing par are given on page 260 of the Year Book of the United States Golf Association for 1924, which for the benefit of our readers we are quoting.

"Par means perfect play without flukes and under ordinary weather conditions, always allowing two strokes on each putting green. For holes up to 250 yards inclusive, par is 3; for holes 251 to 445 yards inclusive, par is 4; for holes 446 to 600 yards inclusive, par is 5; for holes 601 yards and upwards, par is 6. These figures are not arbitrary, because some allowance should be made for the configuration of the ground and any other difficult or unusual conditions. So also should be considered the severity of the hazards, especially on a hole where the par is doubtful. If on any hole the par is more or less than the length of the hole would indicate, state the reason on the score card. Each hole should be measured from the middle of the tee to the center of the green, following an air line as nearly as possible."

As a general thing, when the computations are close to the limits, preference is given to the lower par.

The Nature and Use of Penalty in Golf Architecture

By Max H. Behr

In the active ball games that we all played before the days of golf, a ball was either fair or foul, in or out. They were conflicts of skill for the control of a common ball and were played within a definitely defined space demarked by lines. A ball that passed beyond the surface limits of these areas suffered either a restriction upon its further play or a definite penalty. Owing to this history, there has developed the idea that such limits were primarily to draw a distinction between good play and bad play. Thus an arbitrary penalty, independent of the advantage gained by the more skilful play of an opponent, is supposed to be inherent in the nature of such active ball games of which it is a part.

It is the purpose of this paper to discover the origin of this type of penalty. Such knowledge is of the greatest importance to golf, for it is this kind of penalty only, aside from those which the rules inflict, with which the golfer has to do. Therefore should it be possible to determine the bases upon which it rests, it follows that the only proper use to which it may be put will be known.

If we study the histories of ball games, we shall find that in their original form they possessed a certain characteristic of golf —one that now distinguishes golf from them—that is, the field of play of each was unbounded. One form of early football was a conflict between the inhabitants of two villages, the ball being put in play at a point equidistant between them, the object of the game being to drive the ball back within the confines of the village of the opposing side. All means were used to this end, even to carrying the ball on horseback. Baseball was rounders with no foul line, and

lawn tennis is but a refined adaptation of *long tennis,* in which there were no court lines. The number of players composing a side in these early forms of football, baseball and lawn tennis, was not a matter of consequence.

It must be evident that if a greater number of players were again to compose the sides in these games, their present boundaries would have to be enlarged, and there would come a point where the increase in the number of players would automatically do away with limits altogether. We see, then, a reason why natural pastimes came to be enclosed within a limited playing space. Unbounded, the individual factor was negligible, and they required a greater number of players to make the game enjoyable. Hence, the space in which a game is now played was originally dictated by a desire to give more play to individual skill; a desire which brought about a restriction in the number of players which, of itself, determined the size of the space in which an exercise of skill would be justly rewarded. How important a correct apportioning of space is must be apparent when we consider that there would be inadequate reward to skill in singles at lawn tennis if the side limits of the court were stretched to the doubles line. Volleying the ball would practically cease and the majority of points would be scored by aces. Under such conditions, players would soon tire of playing at all. We are, therefore, presented with the fact that, in the premises, the lines that mark out the space of the singles court were decided upon to enhance the interest consequent on more restricted play. And this will be found to be true of all lines that limit the space in which games are played.

The tendency in games, therefore, has been turned toward a restriction of what were once unrestrained, unbounded and natural pastimes—they have been brought into form. And it would seem to be manifest that the arbitrary boundaries that lay down the limits within which play must take place do not, in the premises, coexist with any idea of distinguishing between good and bad play, but are for the purpose of providing the most desirable surface limits wherein skill may be developed and be most effective. Thus the conception of penalty as having anything to do with the origin or reason for such boundaries is erroneous. Their one object is to apportion space so as to render play interesting.

Now, it is quite possible to imagine a game of lawn tennis being played wherein an out ball would require the replaying of the point. But as the neighborhood of the base and side lines of the court requires the greatest skill to play to, and tends to reap a higher reward in that a greater physical exertion is placed upon the opponent, it follows that there must always be a potential or active pressure upon these boundaries. And if all points had to be replayed when strokes landed beyond them, the loss of time would not be endurable. This was found to be true in baseball where unlimited fouling entailed too great a loss of time.

We therefore find ourselves confronted with a problem which arises in all spacial restrictions—we are faced with the concepts of *space* and *time,* and they must be accounted for and dealt with. In an unbounded and natural pastime they do not force themselves upon our attention. But when we go about making a game by laying off a definite area within which play must take place, we find that we can only concretely control the surface of the ground which, when

leveled and marked off, is made up of the two dimensions, length and width. But to complete space, which is three dimensional, we have yet to account for the dimension height. We must erect something to take the place of this dimension which, to the mental eye, is an imaginary wall rising from the boundary lines. Otherwise it is evident that players would continually drive the ball toward the lines marking the limits of the playing area the more easily to circumvent the physical activity and skill of the opposing side. Activity, unless there be a barrier to it, is subject to a law of gravitation of its own, and, like water seeking its level, will also seek freedom in the easiest way to achieve its purpose. Therefore in lawn tennis a ball passing through our imaginary barrier wall, which is the dimension height, over and above the two dimensions length and width of which the level surface of the court is composed, suffers the loss of a point.

Penalty, therefore, accounts for the dimension height. With it we have confined time, for points do not have to be replayed; and likewise, with it we have established an equilibrium and stabilized all parts of the playing area, for to score a point, one part is as good as another if the opponent be only absent from it. It is evident, then, that the virtue of penalty in lawn tennis is premised upon rendering its playing area interesting.

Lawn tennis has been taken as an example because the use of penalty to replace the dimension height is more pronounced than in other games. With lawn tennis its use is mandatory. With baseball it is necessary to the extent of calling the first two fouls strikes. The abbreviated boarding upon the sides of the polo field and the side walls of the hockey rink are sufficiently high to keep the greater amount of play within bounds; and when the polo ball or the puck goes beyond these boundaries, it is brought in a certain distance and, consequently, we have only a restriction upon play. The same is true of football. In all indoor tennis games, such as true tennis, rackets, and squash, where actual walls rise from the boundaries of the court and are used to play against, penalty only comes into play when a ball strikes these walls above a certain limit placed upon them. It is evident, then, that penalty is only used in games where the nature of them demands it, and its purpose is to enhance the interest of the playing area by stabilizing it and conserving time.

We are here in the presence of a very pertinent and governing law in regard to the use of penalty. Penalty is a means that enables us to construct; it is the scaffolding by which we control three dimensional space. And our desire to so control space is to confine it into various sizes most suitable and interesting to the playing of various games. Just as we build a house for comfort, do we, with the aid of penalty, erect three dimensional space for interest. Penalty, then, is a coin of exchange for interest. But penalty is also an idea and, because of this, the mind is apt to forget its origin. It becomes something by itself. An apt illustration of this is money, also a coin of exchange, which is commonly looked upon as wealth. But money upon a desert isle is worthless and penalty in the desert of thought is impotent. But just as the only legitimate use of money is its translation back into the source from which it sprang in either a purchase of the implements of industry or their products, it follows that the only legitimate use of penalty is also a reversion to its

origin, its use to the end of conserving interest by its protection. That there is an illegitimate use of both is patent. In war, money must be used to destroy its sources in possession of the enemy, but, in games and sports, there is no such coercion.

It may be said, then, that a game is akin to science, for everything in it, lying as it does within the concepts of space and time, is known except one thing—the skill of the players. But every sport, of which golf is one, is an emotional experience in which space and time take on the attributes of infinity and, hence, are akin to religion. If this comparison is well drawn, then man is not the master in golf as in other games. It is not given him, nor should it be his purpose, to make a precise mathematical use of space and lay his law upon it. On the contrary, his object should be to preserve the mystery that lies in undefined space. He is in the realm of art.

Golf was once a free, unrestrained, natural pastime, played over ground untouched by man. Doubtless, the greens and, perhaps, the fairgreen, as upon the common ground at Leith, required scything at times. But mowers to cut the grass had not yet been invented and, consequently, golf was more a winter pastime and was restricted to links land and common only where a fine enough herbage was to be found.

Machinery may, on the whole, have benefited mankind but, in some respects, it has done irreparable harm. The invention of the grass mower permitted the transporting of golf from its original habitat to what otherwise would have been impossible country for its playing. For this we must be thankful. But, whereas, upon links land the fairgreen passed so imperceptibly into inhospitable country that it would have been difficult to draw a line where the one ended and the other commenced, upon our manufactured courses the mower drew the line for us. At the same time, it drew a line in our minds and, with it, the inception of a creed. The fairgreen became all that was good, and the rough all that was bad. Seeing no further than this, it must needs be that we must enhance the good, and how else than by making the bad worse? In fact, there exists today the fatuous belief that the excellence of a golf course is in some way bound up with the number of bunkers and difficulties it possesses.

But what is a hazard in golf? The rules are definitive up to a certain point. But with what do these rules deal? Is it not the third dimension? Are we not prohibited from soling our club in certain situations and doing various other things in order that the influence the third dimension has upon the lie of our ball, whether for good or ill, shall not be disturbed? It must be apparent therefore that if golf were played upon a level surface, practically a two dimensional area, there would be no hazards. Hence the dimension height or depth is the hazard dimension in golf as well as in games.

Now we saw that, in lawn tennis, play sought freedom in the vicinity of the boundary lines of the court, and because of this it became necessary, for the sake of interest, to erect a barrier of penalty upon them. But the golfer also seeks freedom by endeavoring to so play his ball that the way to the hole will be rendered easier and freer upon his next stroke. Therefore according to the philosophy of penalty which we have arrived at, is it not incumbent upon us to use penalty in golf in the spirit of its origin; that is, as a guard and protection to that which excites the most interest? Unfor-

tunately the mowing machine has made the fairgreen an area of interest by itself. But should we look upon this as a definite area and deal with it as we do in games? It would seem that if we allow such an idea to prevail we must inevitably destroy that sense of freedom and choice which is the very essence of such a sport as golf. In golf, nature, more or less modified, is our opponent; there can be no set limitations to space and time.

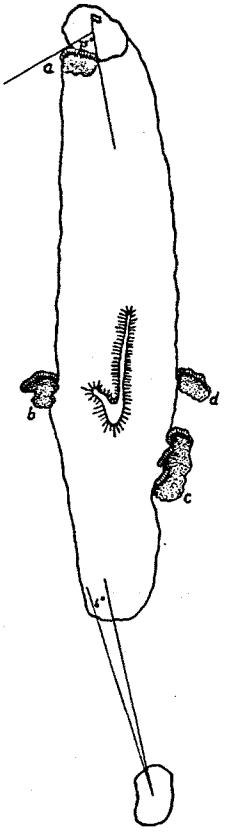
The golf architect therefore is not at all concerned with chastising bad play. On the contrary, it is his business to so arrange the field of play as to stimulate interest, and, hence, the province of hazards is to chasten the too ambitious. The use of hazards otherwise is a corrupt use of penalty; an approach to the subject of strategy from the negative side; a dwelling of thought upon what the golfer should not do; whereas the concern of the architect should be positive and have solely to do with what the golfer should do. In other words, the mission of the architect is not that of a moralist the principal word of whose vocabulary is *don't*. The golfer should not be made to feel that he must renounce, that the primary object for him is to conquer his faults. It is not for the architect to inform him when he has played badly; that is the duty of the professional. No, the mission of the architect is that of a leader. By his hazards, he exhorts the golfer to do his best, enticing him, at times, "to shoot the bones for the whole works." His endeavor should be to instil in the golfer the spirit of conquest by presenting him with definite objectives upon which he must concentrate. The golfer, in meeting nature thus fashioned to his pleasure, is again face to face with life in the raw. It is for him to gain the good in it by the virtue of his courage and skill. It is for him to stamp his law upon it. Therefore, it is not for the architect, by the dictation of his hazards, to lay down the law to the golfer. His duty is merely to assist nature by rendering, in greater contrast, the interest which she, in the first place, affords.

All attempts to use hazards for the sake of penalty alone occasion a duplication of bunkers and the reduction of golf to trench warfare. War is, perhaps, the greatest sport that man is addicted to, and as long as it remains an open battle, there is excitement to be had. But after the Marne, the World War became a nightmare. It ceased to be a sport and became a game with trenches forming its boundary lines and death the penalty for crossing them. And this is true, in a sense, of many of our courses today.

Let us take, as an example, a green guarded by a bunker which must be carried by a shot played from the left side of the fairgreen. Would not a bunker to catch a pull from the tee be a duplication of the green bunker and represent the first trench to be taken on that line to the hole? Would a player who had to play from this bunker continue a frontal attack upon the green bunker, or would he play out to the right and endeavor to outflank it? The answer is evident. But the result of this moral theory of bunkering is that the value of the green bunker is minimized and the player is robbed of the necessity and the resulting excitement of having to play a grand carrying shot over it. But if we remove the pull bunker altogether and put in on the right-hand side of the fairgreen either a bunker to be carried from the tee or a guarding bunker, we have created a

legitimate contrast by placing a penalty adjacent to the position that opens up the hole, the most interesting position to play to.

To attempt to penalize all badly played strokes is just as futile as to imagine that a police force can be made large enough to catch all those who err. If such a thing were possible, society would disappear in it. And such a theory of bunkering, if carried to its logical conclusion, must terminate in the death of golf. But even if this theory is used with discretion, its bunkers are unfair unless they are made large enough to gather in all badly played strokes —that is, treat all alike. This is seen to be true in the case of a ball that just escapes going into a bunker of this type. It is, relatively, just as bad a shot as one that must pay the penalty. But a ball that just escapes a bunker placed to stimulate interest and ambition, even if it lie upon the very edge of it, must be accounted a good stroke; and should it go into it, the stroke must be looked upon more in the way of a misfortune. At least, the player has only himself to blame, for he played fully aware of the risk he was taking. But when his ball finds a penal bunker, he not only commiserates with himself for having played a bad stroke, but resents being told so.



If the reader considers this all very theoretical, let us look at the question from a practical standpoint: whether it is worth while to construct penal bunkers altogether aside from consideration of the cost of their upkeep. In the illustration, we have a hole 400 yards in length, and bunker *b* is a typical penal bunker. It faces the tee with a width of 20 yards and, with the tee as the apex, it subtends at 220 yards only an angle of 6 degrees. Bunker *a*, guarding the left side of the green, is the same in width as bunker *b*. With the hole as the apex in the center of the green, it subtends an angle of 75 degrees. Not only is it a potential hazard for all the territory covered by bunker *b*, but for all the territory which the player wishes to avoid. Bunker *a* is the key bunker to the hole and the player from the tee will, naturally, try to outflank it. Now, if we bunker this hole with a proper use of penalty, he must face a carry over bunker *c*, avoid a slice into bunker *d*, and keep his ball to the right of the strategic ridge in the center of the fairgreen which, otherwise, will throw his ball under the dominance of bunker *a*. These three hazards are placed to create interest, for they guard the most favorable position to play to. It is this abutment of penalty to that part of the fairgreen that is of the greatest value to the player, that results in contrast rendering play to it of dynamic interest. What valid reason, then, is there for bunker *b* and bunkers like it? Would not this hole be far better without its distracting influence, aside from the question of equity, which it must always arouse owing to its definitely limited effectiveness? And may we not even go further and widen the fairgreen in the vicinity of this bunker and thus entice the golfer with a good lie to have a bang at bunker *a*?

With bunkers then placed for interest alone, a player is given the opportunity of assuming the risk of a direct tax if he wishes to gain the more inviting position which they guard and, in the degree he falls short of what he attempts, he comes within the governance of an indirect tax upon his next stroke. This indirect tax can be made severe to the point of being an impassable barrier to the hole. In the latter case, the player loses a stroke just as much as if he had to play from a penal bunker. But, playing from a penal bunker, the player is immediately aware of his loss, whereas playing from the position of the penal bunker, if none were there, no matter what the difficulties were the next shot presented, the slack of despondency would be taken up by the stimulus of hope. The player might even have a go for it, hoping against hope to carry the indirect tax bunker, now become a direct tax through his faulty play from the tee. But even if not so foolhardy, he can play short, or to one side, and by an extraordinary short shot, hope to make up for the original error.

Here, then, is mystery and freedom. But with a lot of penal bunkers staring one in the face from the tee, there is no mystery —only misery. Driving becomes a species of target practice, and one does not have to wonder why the dub kicks.

The strategic side of golf architecture is, hence, not a science of penology. Where it has been looked upon as such, there has always been a destruction of that economy of attention, that centralization of interest which is one of the axioms of art. Looking at a work of art we see a whole, but looking at a police force, we examine each of its units separately. From a psychological standpoint, bunkers send out a wave of danger, as it were, and if such a wave is met by another coming from the opposite side of the fairgreen, the fairgreen becomes static. A certain equilibrium has been established which is against the whole nature of a sport. There is brought into it the principle of equity, a necessity in a game where all must be known and be of equal value, except the skill of the players. But its application to golf is an infringement and violation of its nature.

This does not imply that a position should never be guarded upon each side. On the contrary, it is often highly desirable and of the greatest interest. Where distance is the factor from the tee, a fairgreen that gradually narrows at, say 250 yards, with yawning pits awaiting a mis-directed shot, is not a type of penal bunkering. Nor may any desirable position guarded upon either side be looked upon as such. The fourth hole at the Lido and the bottle-neck hole at the National are splendid examples. If the player at the Lido refuses to face the great carry from the tee to a narrow fairgreen guarded upon either side by perdition, he can take the safe and longer way but he gives up any chance of getting home in two strokes. Here the indirect tax is a definite loss of distance which can, in no way, be made up. At the National, the approach from the neck of the bottle is much easier than from the rest of the fairgreen to which play from the tee requires little risk.

But the misuse of hazards is a delusion and a snare, an enslaving and destructive principle, for it demands that they be made large enough to fulfill their purpose. In other words, the idea of penalty for penalty's sake commits us to size and, of course, the greater this is, the better is the idea carried out. The ground is no longer being

interpreted for the sake of interest but to carry into effect a logical idea, and the architect ceases to be an artist; but, being bound to no such governing idea, the architect becomes a free agent. Using hazards for the purpose of interest alone, he may use them in the way of emphasis to bring out the highlights of a hole. They can be made formidable or small. Often a tiny pit placed in just the right spot, so small that it can have little effect upon actual play, can be a mental hazard with tremendous effect upon the morale of the golfer. But to place such a pit is as truly an art as one revealing scratch of a pen by a Rembrandt which we ordinary mortals could not duplicate with a thousand scratches. The pseudo-golf architect will have the faint glimmerings of an idea and will try to catch it with numerous bunkers; whereas, the true artist will place just one bunker upon the sore spot and it is done. Such a bunker is the road bunker in the face of the seventeenth green at St. Andrews. To have placed such a bunker required rare imagination and audacity.

The golf architect, therefore, should look upon himself as an artist; and the colors of his palette are the various types of hazards which he employs to lend interest and bring out the features to holes which he either invents or interprets from the ground; and the pigment of his colors is made up of the dimension height or depth, the hazard dimension of the ground. It is this dimension which unlevels the ground as in slopes, undulations, mounds and bunkers, and makes a hazard of long grass. It explains the greater charm that lies in playing golf upon links land; its tumbling nature affords an ever mystery as to just the position from which one will have to play the ball.

The great golf architects have always looked upon the province of hazards as that of exciting interest. But even so, such a viewpoint by no means excludes a hole made up of penal bunkers. Such a hole may afford the greatest interest in the way of contrast to the rest of the holes. But it must be evident that, if such a theory of bunkering predominates, it must arouse controversy, and understanding can never flourish in terms of controversy. And yet, to one uninitiated into the secrets of golf, to minds bred on games, this moral theory of bunkering is a very natural one to assume, for the wish of man is ever toward reducing nature to his order of life. But with golf, as with all sports, this civilizing instinct has no place. Golf is an uncivilized pastime—it is not a game.

Therefore, those who hold to the theory that the purpose of hazards is to chastise, labor under a great handicap. Sand is the greatest birch rod they can use, and the result is that their work is not colorful but a painting in the sepia of this one type of hazard. A proper balance of values has been destroyed and the lesser hazards lose their importance. And yet, what seems most needed in golf architecture today, is a greater use and variety of color by undulating the fairgreen, the construction of natural-appearing strategic mounds and ridges, and some character given to the rough.

But, above all, golf should be kept an open battle; danger should beckon, owing to its proximity to positions of the highest interest; and the whole impulse of play should be forward with a sweep and a bang and not be, as it so often is, a tacking process. There would seem to be no reason why courses laid out and designed in this manner should not be as great a test as one could wish and be all the more pleasurable to play.

Back Numbers of The Bulletin

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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 answers 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. Obtaining the Atlanta strain of Bermuda grass from seed.—I have written to two men for runners of the Atlanta strain of Bermuda grass sufficient to plant two putting greens but they advise me they have not sufficient to spare for the purpose. Do you know of any firms growing the Atlanta strain for golf course use? (Virginia.)

ANSWER.—If you are unable to obtain the stolons of Atlanta Bermuda grass which you desire, the next best thing would be for you to purchase Arizona-grown Bermuda grass seed. From the Arizona seed you will obtain a fair proportion of plants of the Atlanta strain of Bermuda grass. From the turf you grow from the Arizona seed you will find perhaps one-half of it will be of the Atlanta strain. It will then be possible for you to select plugs of the Atlanta strain from your turf, for use in starting a nursery, and you will be able eventually to replace the ordinary Bermuda in your greens with stolons from this nursery. Another method would be simply to select plugs of the Atlanta strain from your greens and insert these into the ordinary Bermuda turf.

2. Ice sheets forming on turf.—Is damage likely to greens covered 2 inches deep with sleet frozen into solid ice, especially new vegetatively planted greens? Should ice be broken up and removed now? Been on greens 4 days. Wire reply collect. (Illinois.)

ANSWER.—We have never yet observed any harm occurring to grass due to its being covered with an ice sheet, except in spots where the soil was waterlogged, which is very often the case in low places. At a golf course near Washington some years ago the turf was covered with a solid sheet of ice for six weeks. The officials became alarmed at first and had the ice broken on one of the greens, but that was found to be expensive and to do a lot of harm to the turf. If you should attempt the same on your newly planted vege-

tative greens the results would probably be disastrous. We would advise you therefore to leave your greens alone as it is doubtful that the ice will do any harm.

3. Experiments in stimulating Bermuda greens; use of oyster shell, lime, manure, and ammonium sulfate.—We have Bermuda greens. They turn brown in winter, but by using Italian rye grass and redtop we have very satisfactory greens during the coldest season. As a general thing the Bermuda which turns brown in winter will grow again in the spring or summer, but not always as satisfactorily as desired unless it is encouraged to some extent, and we are considering the adoption of either of the following programs for the coming year. One program is to top-dress March 15 with 100 pounds of crushed oyster shell per green and water this into the ground; a week later, to sow 50 pounds of Bermuda seed per green and top the seed with a compost of fine cow manure and river sand mixed at the rate of 1 spade of river sand to 5 spades of manure. The other program is to top-dress March 15 with 100 pounds of crushed oyster shell per green and water this into the ground; a week later, to sow 35 to 55 pounds of Bermuda seed per green; two or three weeks later, to top-dress with river sand to which ammonium sulfate has been added so as to apply 4 pounds of ammonium sulfate to 1,000 square feet of green, watering this well into the ground. We should be glad to have your advice in this matter. (Louisiana.)

ANSWER.—We would advise you to treat one green according to your first program, a second green according to your second program, and a third green, or indeed all the others, by a fertilizing and top-dressing method which has so far proved the best method for use on bent greens in the North and which has also been followed with excellent results by golf courses in the South on their Bermuda greens. This third method is the occasional top-dressing with compost and the rather frequent use of ammonium sulfate. We believe a compost composed of one-fourth good loam, one-fourth manure, and one-half sand much to be preferred to the top-dressing you mention. The objections to the use of large quantities of manure are that it tends to introduce injurious insects into the soil and it requires excessive screening in order to get a material fine enough to sift down well into the turf. The objections to the use of oyster shells or lime in any form are that it tends to encourage certain weeds and, as far as we can see, has yet to demonstrate that it is of any value at all. The frequent use of ammonium sulfate, on the other hand, has demonstrated its effectiveness in keeping turf free of weeds and apparently has some effect in keeping turf free of earthworms. We would not advise you to spend any money for seed and the expense of sowing it even though your Bermuda turf may be thin. As for the use of Italian rye grass or redtop on Bermuda greens for winter play, it has been the experience of some clubs that this has a tendency to retard the recovery of the Bermuda grass in the spring.

4. Spring and winter seeding of fairways and planting of stolons.—On account of the dryness of last fall and the late start we got in seeding our fairways, we were obliged to leave four of the fairways unseeded. We should therefore appreciate your advice as to the best method and time for seeding these fairways in the spring. Most of the greens we planted have come up in excellent condition

but there are two or three about which we are doubtful. We are prepared, however, to top-dress them and add an additional light sowing of German bent seed. Several seedsmen have suggested to us that it would be better to reinforce these greens with stolons of creeping bent in the spring. What is your advice also on that point? (New York.)

ANSWER.—The great objection to spring seeding and spring planting of stolons is that the young plants suffer greatly from the onset of weeds. When the work is done in the fall, however, the plants have made sufficient headway by spring to withstand the weeds in a marked degree. This difficulty with spring planting is, however, not so great in your latitude as it is southward, and in your case we believe you are perfectly safe to proceed with the seeding of your fairways and the planting of stolons in the spring. The earlier you get the work done in the spring, the better. With regard to the seeding, it is generally difficult to work the land in early spring, and we would therefore advise that you seed in the late winter, seeding directly on the snow if you have to. This is nearly always successful, and two or three weeks' time are thus commonly gained. Of course, after the ground has thawed and dried out in the spring, you will need to roll it, as it will be in a very loose condition.

5. **Grasses for the rough in the South.**—Is there any grass seed that can be bought for seeding the rough in Florida? (Florida.)

ANSWER.—We know of no grass of which seed can be secured that is very well suited for the rough in the South. The native grasses make very good rough. The common native grasses of Florida consist of broom sedges and wire grass, both of which are very desirable for the rough. Of course there will be some sand spurs, but it is difficult to avoid these unless you establish a solid turf, for which either Bermuda grass or carpet grass would have to be seeded. Seed of these latter grasses can be purchased from any Southern seedsman.

6. **Fertilizing of fairways and putting greens.**—We should like your advice regarding the fertilizing of our fairways and greens for the coming year. (New York.)

ANSWER.—As for your fairways, best results will be obtained from top-dressing them in the winter or early spring with well-rotted and well-screened stable manure. If you are unable to obtain such material, the next best thing is an application of bone meal at the rate of 300 to 500 pounds per acre, preferably in February or early March. If you can get sufficient manure to apply on the thin spots of your fairway, do so, and use bone meal on the rest. As for your greens, we would advise you to top-dress them with compost made as described in the article in the June, 1924, BULLETIN, at the rate of about 1 cubic yard of compost to 3,000 to 5,000 square feet of green at one application. Also it would be advisable for you to apply ammonium sulfate, making two applications in the spring, one in the summer, and one or two in the fall. The applications in the spring and fall should be at a rate of not to exceed 3 pounds to 1,000 square feet, and in the summer at the rate of not to exceed 1 pound to 1,000 square feet. There is great danger of burning the turf if these rates

are exceeded, and especially so in warm weather. The ammonium sulfate should be well watered in after each application.

7. Water requirements of a sandy loam soil.—For the design of a water system what would you consider the approximate requirements for a sandy loam with complete drainage underneath? Would one inch of water every two days, contemplating watering heavily every other day, be sufficient for creeping bent greens on such soil? What pressure would you recommend at the end of the delivery pipe? (Alberta.)

ANSWER.—The problem you bring up has been studied for some time at Pine Valley Golf Club, Clementon, New Jersey, where they have a very sandy soil, and doubtless the experience of that club will be of some help. At Pine Valley they have obtained satisfactory results for the past three years on the basis of one pint of water for each square foot of surface every other day. This amounts to only 1/10 inch of rainfall. They are, however, increasing their pumping facilities, not so much with the idea of applying more water but of distributing it more economically, and they expect in the future to be able to deliver probably 1½ pints of water per square foot over the entire course, which would amount to aproximately 1/7 inch of rainfall. For greens alone we should consider that you would need facilities to do a little more than this. In regard to pressure, at Pine Valley they have 100 pounds pressure at the pump, which gives them 30 pounds pressure at the outlet at the highest point and at the end of the smallest pipe. The size of the pipes ranges from 8 inches at the pump down to 2 and in some cases 1 inch at the greens. As regards sprinklers, there is much to be said in favor of the simpler types, as the complicated ones get out of order more often, and as sprinkling is generally done at night this is apt to cause considerable difficulty. The sprinkler used at Pine Valley is a home-made affair, consisting of ¾ and 1-inch pipe to which a butterfly sprinkler head is attached, which has large openings which do not clog readily, and which at the same time makes a good distribution of the water.

8. Seed for producing bent greens.—We are preparing to build nine additional greens on our course and desire to have these in play with as little delay as possible. As we have no creeping bent nursery and can not obtain sufficient creeping bent stolons to plant the greens vegetatively, we have about decided to seed with a mixture of 50 per cent New Zealand bent and 50 per cent redtop. Your suggestions in this matter will be appreciated. (Wisconsin.)

ANSWER.—A mixture of 50 per cent German mixed bent and 50 per cent redtop gives very good results. The redtop is rather slow in disappearing, but ultimately does so, and a good bent green results. A mixture of 1/3 redtop and 2/3 German mixed bent is still better. These mixtures are, however, to be used only in the interest of economy, as bent alone is to be preferred. We advise the use of German mixed bent in preference to New Zealand bent, inasmuch as the former contains a trace of creeping bent as well as some velvet bent, which are not found in the latter. Three pounds of good bent seed, or bent-redtop mixture, are ample for seeding 1,000 square feet of green.

9. Commercial mixed fertilizers; spring fertilizing of fairways; rate of application for bone meal.—I am enclosing a pamphlet describing * * * Plant Food, which the company advises us to use on our fairways in place of the bone meal which we have been using. You will note that the analysis of their fertilizer is as follows: Two per cent sodium nitrate; 2 per cent ammonium sulfate; 10 per cent available phosphoric acid; 1 per cent insoluble phosphoric acid; 4 per cent potassium sulfate. We now use 1,100 pounds of bone meal per acre, and they claim we will have to use only 300 to 500 pounds of their fertilizer per acre. Our soil is heavy clay, and we have had good results with bone meal. They offer their product at $45 per ton delivered in carload lots; we have been paying about $37 per ton for bone meal. Your advice in the matter would be appreciated. (Pennsylvania.)

ANSWER.—We regard your application of 1,100 pounds of bone meal per acre as excessive and believe you can get as good if not better results with bone meal applied at the rate of 300 pounds per acre as the "Plant Food" you mention applied at the same rate. For fairways we have found bone meal to be excellent and the economical and effective application to be 300 to 500 pounds per acre in early spring. Raw bone meal usually contains approximately 4 per cent nitrogen and 22 per cent phosphoric acid. Steamed bone meal contains approximately 1½ per cent nitrogen and as high as 28 and 30 per cent phosphoric acid. There is practically no potash in bone meal, and with the possible exception of very sandy soils it is doubtful if fairways need potash to any considerable extent.

10. When to reseed established turf.—A representative of a seed firm has just visited us and recommends that we sow 30 to 40 pounds of seed on our greens this spring. To us the turf seems to be in satisfactory condition. We should like to have your advice before we purchase this seed. (Connecticut.)

ANSWER.—If your greens seem to be in satisfactory condition, with a good or even a fair stand of grass, putting on additional seed in the spring is simply throwing money away. Your greens require no other treatment this spring and through the summer than occasional top-dressings with good compost with one or two applications of ammonium sulfate. It would be preferable to apply the ammonium sulfate mixed with the compost. About the only case in which seeding on established turf pays is to seed bent on putting greens composed of other grass, doing this in late summer.

11. Time to sow Bermuda seed.—We are preparing to seed a new green with Bermuda grass this spring and should be glad to know what you consider the best time to plant Bermuda seed. (Virginia.)

ANSWER.—Bermuda seed will make practically no headway until the weather gets warm. In the northern part of the Bermuda belt we would advise waiting until May 1 before the seed is sown. In the southern part it should be sown as soon as the rains begin any time after April 1.

BOOST THE GREEN SECTION

Meditations of a Peripatetic Golfer

An ideal golf course should be a severe test for the expert and also perfectly adapted to the game of less skilful players. This is entirely feasible.

Yellowing of turf is frequently a symptom of poor drainage.

"Turbary," in English law, is the right to dig on another man's land. Every golf club seems to give its members the "right of turbary."

Wherever possible, a putting green should appear as a definite objective.

Weeding out dead grass in November! Better pull it out when it is young, in June and July.

"Knowledge Comes but Wisdom Lingers" might well be the motto of some greenkeepers.

Placing hazards for the short slicers especially is not very commendatory. The poor fellows penalize themselves enough.

The wise man profits by experience. The other fellow continues to use humus and fescue.

Every good golf hole is a clean-cut problem. It can not be a Chinese puzzle and be desirable.

"A prophet is not without honor save in his own country." That is why it is rare for a golf club to use its most qualified man as chairman of its green committee.

Anent a recent treatise on golf architecture, one of our members, in the way of comment, quotes the following:

"See them underneath the tree
Gather 'round the goosegirl's knee
While she reads them by the hour
From the works of Schopenhauer.
And do they really understand
What Schopenhauer is driving at?
Oh, not at all; but what of that?
Neither does she. And for that matter
Nor did he."