

# Bulletin of the Green Section of the U. S. Golf Association

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BETTERMENT OF GOLF COURSES

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### Merry Christmas!

The Salvation Army distributes baskets to the poor, pretty girls indulge themselves in sweet charity, and golfers are remembered with new golf bags, clubs, stockings, shoes, and what not. But though the Christmas spirit fills the air, no one thinks to give the Green Committee a load of manure, some worm killer, or any other pleasant memento of the occasion. Not a soul thinks to give the greenkeeper or green-committeeman a call on the telephone even to express a belated appreciation of the work done during the season to provide pleasure for golfers. The poor outcasts may be likened to the waifs so frequently pictured as looking with wistful eyes at a window full of toys or cookies, but without a like sympathetic response; nothing for them, not even a pleasant word; rarely a kind thought. The golfer who gets from Santa Claus a gift that is useful or ornamental in the game continues to think that he surely would have had a four on No. 5 on that memorable day when he almost broke his previous record, had not the green committee left unfilled a hole originally made by an unreplaced divot.

There is nothing new in all this. Ishmael must have been on the green committee of his club. The hand of every man was against him. And in time his hand was against every man.

This time, or at least New Year's, is the season to reform. This is the time to speak kindly and appreciatively to the green-committeemen. It's the best present that can be given. The annual meeting of your club will be coming on soon; and then let the spirit pervade you. Then see that the committee is given a fair chance. Good greens without money, like bricks without straw, are impossibilities in the absence of miracles. Remember now, at the meeting of your club, and at all times, that the green-committeeman, who gives up his game to make it possible for you to play and enjoy golf, is at least entitled to a kind word. He has given more to you than you have given to him. And the least you can do is to call him up and say, "Merry Christmas! I was thinking of the good times I've had this year playing golf, and while I've cursed you day in and day out I now wish to say that I really appreciate all you've done or tried to do to keep our course in good condition. Merry Christmas!"

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Volume I of The Bulletin (1921) has been reprinted and may be obtained in one cover for \$2.25.

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### Annual Meeting of the Green Section

The annual meeting of the Green Section will be held at Hotel Astor, New York City, January 4 and 5, 1924, in connection with the annual meeting of the United States Golf Association. A personnel of the Green Committee of the United States Golf Association for 1924 will be elected at the meeting, and such other business transacted as may properly come before the sessions. The officials will report on the progress of the work of the Green Section, and a number of committeemen and experts will present an instructive program, illustrated with lantern slides, covering in detail important problems of golf turf maintenance. Luncheon will be served on Friday. A cordial invitation is extended to all interested in these problems to attend the meeting, and a special invitation is extended to greenkeepers. The program is as follows:

*Friday, January 4, 10 a. m.*

INTRODUCTORY ADDRESS—

J. Frederic Byers, President, United States Golf Association  
 VEGETATIVE PLANTING OF PUTTING GREENS-----Lyman Carrier  
 DRAINAGE-----Prof. W. P. Miller, Ohio State University  
 WATERING THE FAIRWAYS-----William F. Brooks, Minikahda Club  
 THE SOIL FOUNDATION OF A PUTTING GREEN—  
 Frank B. Barrett, Hollywood Golf Club

*Friday, January 4, 2 p. m.*

BROWN-PATCH IN 1923-----R. A. Oakley  
 GOLF ARCHITECTURE FROM THE VIEWPOINT OF AN AMATEUR—  
 George F. Willet, Essex County Club  
 PUTTING GREENS IN THE SOUTH-----Thomas P. Hinman, Druid Hills Golf Club  
 THE EXPERIENCE OF A GREEN-COMMITTEE CHAIRMAN—  
 H. Kendall Read, Country Club of Atlantic City  
 THE JAPANESE BEETLE AND OTHER GRUBS—  
 L. B. Smith, United States Department of Agriculture

*Saturday, January 5, 10 a. m.*

THE CHICAGO GREEN SECTION AND ITS WORK-----Leonard Macomber  
 THE NEEDS OF THE GREEN SECTION AND PLANS FOR MAKING IT PERMANENT—  
 Walter S. Harban  
 HOW THE GREEN SECTION HELPS THE GOLF CLUBS—  
 George Low, Baltusrol Golf Club  
 ILLUSTRATED LECTURE ON THE WORK OF THE GREEN SECTION-----C. V. Piper

## Report of the Nominating Committee for 1924, United States Golf Association

This Committee, of which Mr. Findlay S. Douglas is chairman, submitted its report under date of November 1, 1923. According to the constitution of the Association, each member of the executive committee must be a member of an active member club of the Association, also six out of the thirteen members of the executive committee must be a member of the executive committee or a director of some state, sectional, or recognized golf association. The ticket is as follows:

*President*

Wynant D. Vanderpool-----Morris County Golf Club

*Vice-Presidents*

Robert A. Gardner-----Onwentsia Club  
 Williams C. Fownes, Jr.-----Oakmont Country Club

*Secretary*

Cornelius S. Lee-----Tuxedo Golf Club

*Treasurer*

Edward S. Moore-----National Golf Links

*Counsel*

Adrian H. Larkin-----Shinnecock Hills Golf Club

*Executive Committee*

Roger D. Lapham-----San Francisco Golf & Country Club  
 John R. Lemist-----Denver Country Club  
 Thomas B. Paine-----Atlanta Athletic Club

C. O. Pfeil.....	Memphis Country Club
James D. Standish, Jr.....	Lochmoor Club
William E. Stauffer.....	Audubon Golf Club
Henry H. Wilder.....	The Country Club
Alan D. Wilson.....	Merion Cricket Club

*Six Sectional, State or recognized Golf Associations are on the ticket as follows:*

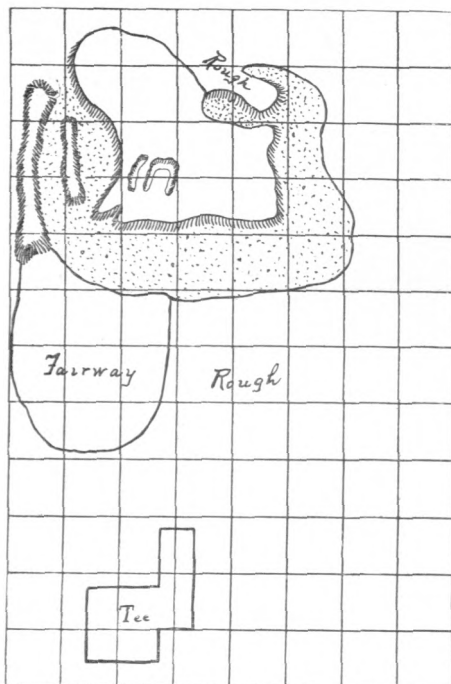
William C. Fownes, Jr.....	Pennsylvania Golf Association
Robert A. Gardner.....	Chicago District Golf Association
Roger D. Lapham.....	California Golf Association
John R. Lemist.....	Trans-Mississippi Golf Association
Thomas B. Paine.....	Southern Golf Association
C. O. Pfeil.....	Western Golf Association
James D. Standish, Jr.....	Public Links Golf Association

*Nominating Committee, 1925*

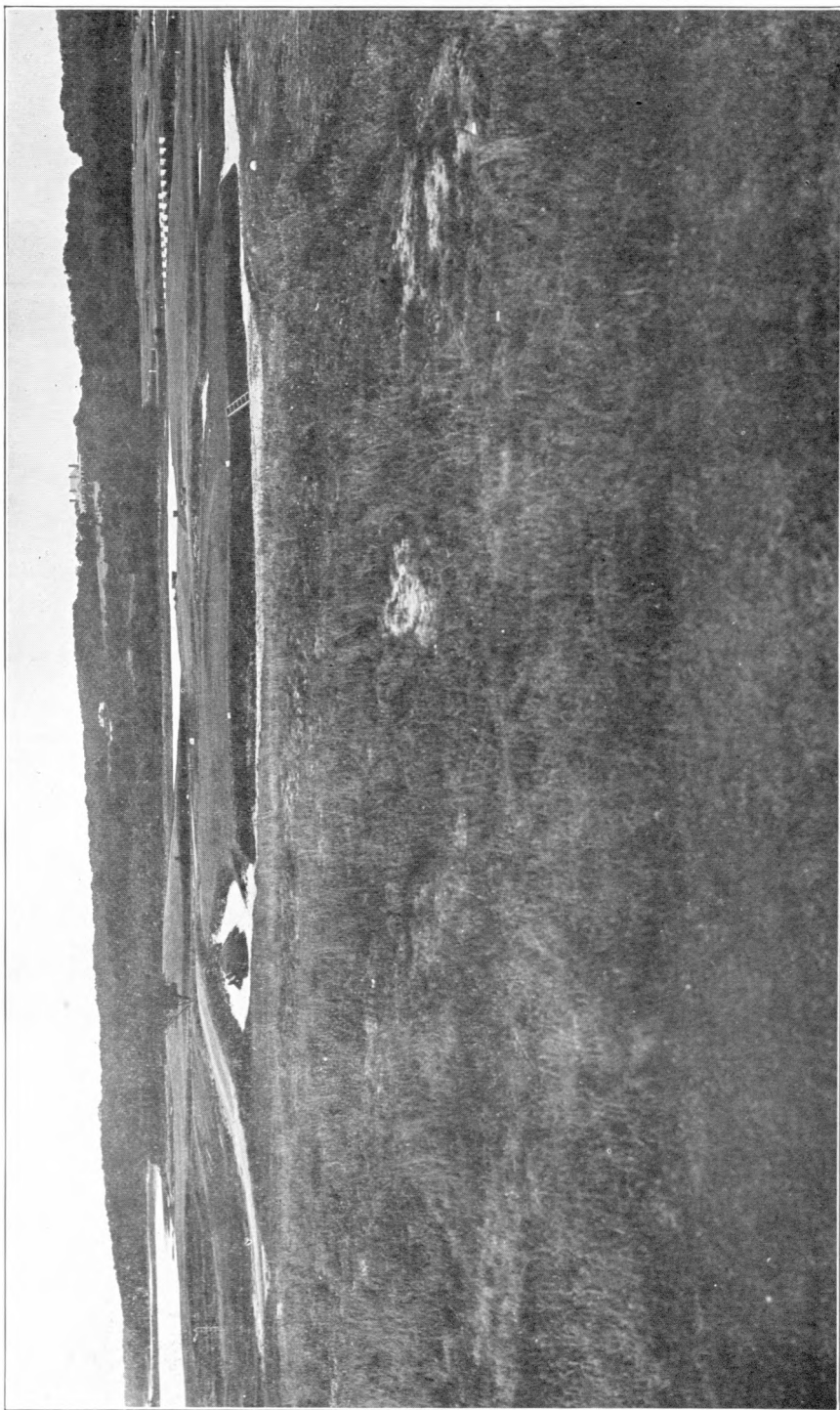
Howard F. Whitney, Chairman.....	Nassau Country Club
W. A. Alexander.....	Old Elm Club
Rodney W. Brown.....	The Country Club
H. Chandler Egan.....	Waverly Country Club
John Reid.....	Racine Country Club

## Instructive Golf Holes VI

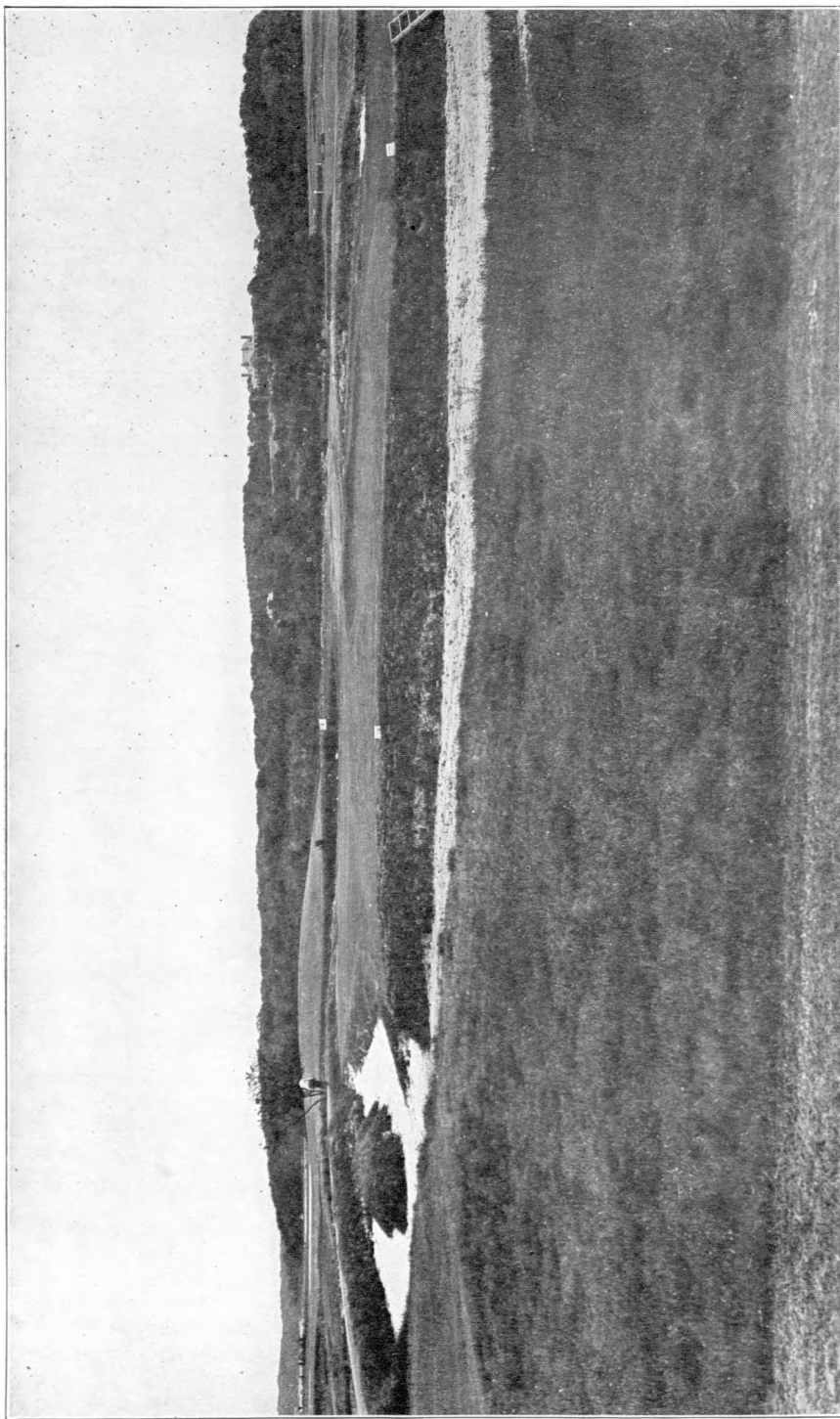
No. 6. National Golf Links of America, Southampton, Long Island. 120 Yards  
(95 Yards to 125 Yards.)



This interesting hole runs due east, and the photograph shows the residence of the designer, Mr. Charles B. Macdonald, in the distance on the ridge. The teeing ground is about 15 feet higher than the putting sward and large enough to permit considerable variation in the length of the hole. Originally the putting sward was much smaller, but extensions were added on the right and at the back. While the total area of the sward is large (approximately 10,000 square feet), the form is such that the shot from the tee must be well played to reach and hold. A small area of fairway to the left permits one to play the hole in two shots if he so chooses. The two elevations in the lower left corner were near the center of the original green, and when between the ball and the cup make the putt a trying one.

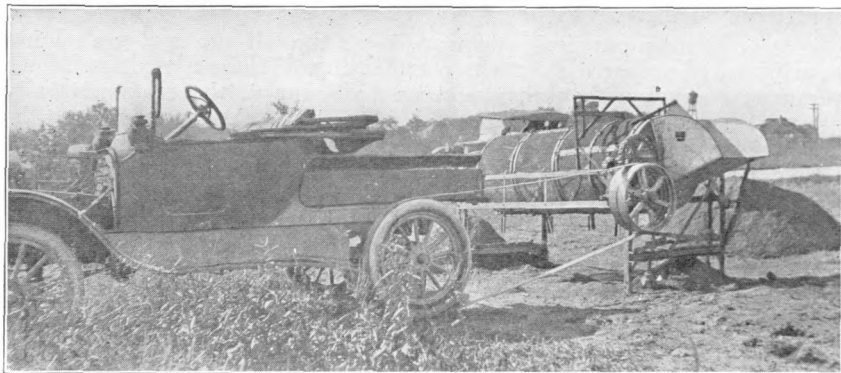


Hole No. 6, National Golf Links of America. View from Tee



Hole No. 6, National Golf Links of America. Closeup View of Putting Green

## Power Transmission Direct from Automobile Wheel



Automobile Driving Revolving Screen

This illustration is furnished by Dr. J. L. McBride, Chairman of the Grounds Committee, Shannopin Country Club, Pittsburgh, Pa. It shows the method devised by the greenkeeper of the club for obtaining power from an automobile engine for driving his revolving screen. Dr. McBride writes that the back wheel of the automobile is blocked up and the transmission belt connected directly with the pneumatic tire of the automobile. The revolving screen in the illustration has been operated in this manner half a day without stopping and without the engine of the automobile heating.

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## Transplanting Trees

By F. L. MULFORD, *Horticulturist, U. S. Department of Agriculture*

Deciduous shrubs and trees are ordinarily moved when dormant or from a little before the leaves drop in the autumn until growth starts in the spring. With extra care they may be moved at other times. In the eastern half of the United States they may be moved either fall or spring, whenever the ground is not too wet. On the Pacific Slope fall is best, because there is a longer time for roots to form before hot, dry weather comes. In the colder parts of the intermediate region spring transplanting only should be attempted unless it is possible to water the plants thoroughly in the fall, to mulch them to prevent the ground from freezing as deep as the roots extend, and to protect the tops by wrapping or boxing so that the winter winds will not dry them out. In the warmer sections of the intermediate region, the longer before hot weather the planting is done, the better, provided ample water can be supplied. The secret of successful transplanting is getting a good root growth started before top growth makes too heavy a demand upon the roots. In cool, moist climates there is not the same care demanded as in warmer or drier ones.

Evergreen plants are moved at such times as root growth is most likely to take place rapidly. This is necessary, because these plants are constantly covered with foliage demanding moisture for evaporation, and this must be supplied or the plant dies. For this reason, too, these plants must be moved with earth about the roots or, as it is called by nurserymen, with a "ball." The time for doing this in spring is when the growth of the



evergreen is well started, and in the late summer or fall after the rains begin until about a month before it is cold enough to freeze the surface of the ground at night.

It is entirely practicable to move large trees if the root system has been properly prepared for such transplanting. Where a tree has grown for several years without having been root-pruned, the roots naturally have extended some distance in search of food and there remain near the trunk only a few of the main carrier roots, the feeding rootlets being at the ends of the growing parts. In order to transplant the trees satisfactorily it is necessary to cut off some of these feeding roots not far from the base and thus cause new ones to form near the body of the tree so that they may be moved with it. It is because this has been done with nursery-grown trees that they are better than trees taken from the wild. By digging around the tree a year or two in advance of transplanting, this change of root system can be accomplished. It is probably best to dig part way around the tree one season, say one-fourth of the way around on each of two sides of the tree, refilling the trench with well-enriched earth, and completing the operation a second season. In this way new roots will be formed which can support the tree after it has been moved. There are professional tree transplanters who move trees of great size, but it is essential that the trees be in good condition in order for the transplanting to be successful.

In favorable localities trees that form an abundance of roots quickly, such as willows, poplars, and elms, may be transplanted from open fields, in sizes up to a foot in diameter, without previous preparation, or better by digging a trench about the tree the middle of the previous summer provided constant attention can be given the following two years to supplying an abundance of water, sometimes every day if weather conditions should demand it.

At the time of transplanting, the soil must be of such a texture or sufficiently dry that there will be no danger of its packing hard or baking about the roots when it dries out. Light soils are not likely to behave in this way; and heavy soils will not, provided they are sufficiently dry.

The holes should be dug sufficiently wide to take all the roots without doubling them back, and deep enough to set the plant a little deeper than it grew before and still have two or three inches of good new soil under it. The good top soil should be saved for putting back in the hole about the roots of the plant. The sub-soil should be taken away, replaced by good top soil. Well-rotted manure and ground bone or cottonseed meal may be mixed liberally with the earth in which the tree is set, but should not come in direct contact with the roots.

The plant should be set not over an inch deeper than it grew in the nursery. The earth should be fine and well worked in among the roots. These should be placed as nearly as possible in the position in which they grew, care being taken not to leave them in layers without soil between. The plant should be gently worked up and down to be sure that there is no opening left under the place from which the roots branch. After the hole is partially filled, the soil must be well tamped to bring the roots and soil into close contact with one another. If the earth is very dry, water should be applied before the hole is finally filled. After the water has soaked away, the balance of the soil should be replaced, but without any tamping or firming of any kind. If the work is being done in the fall it is well to make a mound around the plant to prevent wind from swaying it and loosening it in the soil. This mound around the tree should be used only



in fall transplanting and should be leveled down as early as possible in the spring. If the plant is large, it should be securely staked to serve the same purpose. Mulching with coarse manure or straw will aid in cold regions by preventing frost from penetrating the ground below the roots and in dry regions by holding moisture.

The holes for evergreens must be wide enough to permit of easy placing of the ball and filling good well-enriched soil around it. The holes must be deep enough to permit of placing good soil under the ball and still having the plant at the same depth at which it was before transplanting. To accomplish this it is usually best to start with the hole two or three inches deeper than the ball of roots and then gradually to work soil under the ball until it is about one inch deeper than desired. When settling is completed it will probably be about right. Only good top soil, well enriched, as for deciduous trees, should be placed about the ball, and the soil should not be so wet as to be likely to puddle—that is, to bake into brick-like masses—upon drying. If the soil after being squeezed together in the hand springs apart on being released, it is not too wet; but if it remains in a sodden mass it should not be used.

The soil should be packed firmly about the ball of earth, and then well watered. To facilitate watering, it is best to construct a saucer-shaped depression around the plant, into which the water can be poured without its running off before it has a chance to soak into the ground. This watering must be repeated frequently until the plant becomes re-established. In dry times or climates, this will need to be daily, but in moist climates it need not be so frequent in an ordinary season. The tops should, however, be sprayed frequently in order to reduce the evaporation from the foliage as much as possible. Several times a day is best; but this, although essential in dry regions, is frequently impracticable. A burlap screen on the windward side is a great help in protecting against drying winds.

The top of the plant must be pruned somewhat in proportion to the amount of roots which was destroyed in digging. This usually means that one-half of the top should be cut away when the plant has been well dug and well handled, and three-fourths or more if it has been poorly dug or handled. As far as possible, this should be done by removing whole limbs or branches rather than by cutting back the ends, so that the general shape or character of the plant may be preserved.

Failure in transplanting is most often due to the drying out of the plant, and especially its roots, during one or more of the operations. Success depends upon keeping the roots covered with wet moss, straw, or other efficient covering at all times while moving and while in the ground when not actually being transported. If plants can not be placed in their permanent location immediately upon receipt, they should be put into the ground temporarily until the final planting can be attended to. This is usually called "heeling in." It is often a help, in protecting the roots from drying out too rapidly and assisting them in coming into immediate contact with the soil, to dip them in very dilute clay and cow manure just before planting, or even clay alone.

As a rule, evergreens are not pruned at transplanting. When pruning is however necessary, great care must be used not to mar the beauty of the plant. With many evergreens, pruning is almost or quite ruinous to their appearance. This is an additional reason for the use of great care in handling the plant so as not to loosen the contact of the roots with the soil. If the ball is roughly handled or cracked, this loosens the contact of

the roots. Likewise the plant should not be permitted to lie around after receipt. If planting can not be attended to at once, it is well to bury the ball, burlap and all, and water regularly until planted.

Evergreens are often planted without removing the inside wrapping of burlap next the ball if the soil is inclined to loosen, provided there is no straw or other packing inside the wrapping. Burlap is usually rather loosely woven, and small roots will easily find their way through it. This growth of roots through the burlap may be facilitated by cutting some gashes in the wrapping at several points on the sides and bottom, care being taken not to cut the roots. When planting is nearly completed, the burlap which might protrude above ground can be cut off just beneath the ground level. If canvas or other thick, heaving wrapping material has been used, it must be removed before planting, as it would act as a barrier to the passage of both moisture and roots, as would also a layer of straw or similar packing material.

In the landscaping of golf courses, native trees should be largely used, as they will aid materially to a course's fitting in with its immediate surroundings, and moreover they are more likely to thrive than are imported kinds.

In the South, broad-leafed and cone-bearing evergreens should be used rather liberally, largely to relieve the winter bareness that would result if too large a proportion of deciduous trees were used. In the North, a few evergreens, which of necessity will be largely cone-bearing kinds, should be used for the sake of the contrast of form and color they provide, but the proportion should be small, as otherwise the general effect would be heavy and possibly depressing.

Owing to the excessive evaporation caused by dry winds, few evergreens can be grown successfully in the dry central and western portions of the United States, especially where unprotected by buildings or other trees. There are some kinds, however, which may be grown even under rather severe conditions, such as cedars, Austrian pine, Black Hills spruce, and arbor-vitæ. For such regions, therefore, most of the plantings should be native deciduous trees.

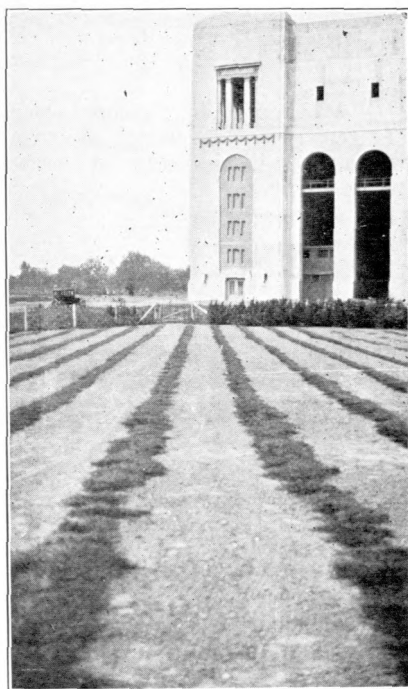
Much can be gained in attractiveness by including some of the showy flowering trees that will add touches of color at different seasons, provided rules against the pulling of the flowers would be observed by members of the club and could be enforced against others. It would seem that golf clubs should be an example in this respect. This is a question, however, which must be decided by each club for itself.

In some locations a quick, tall growth may be desired, in which case forest and shade trees may be planted closely together, as closely as 12 or 15 feet apart; while in those locations where a spreading effect is desired, a single specimen of a broad-growing tree may be used. Often the best effects are secured by having the foliage rise directly from the turf without the trunks being visible. Many of our trees may be grown satisfactorily in this manner, while under other conditions a fringe of shrubs may be necessary for obtaining the result. Two deciduous trees which are especially good for producing this effect are Norway maple and beech. Among the cone-bearing trees, spruces, firs, and hemlock are particularly adapted for this purpose.

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The editors are always glad to receive notes of interest for publication in The Bulletin. Contributions from greenkeepers and greencommitteemen are always welcomed.

### Nursery Rows of Creeping Bent



The accompanying illustrations show rows of creeping bent runners developed in nurseries. The rows in each illustration were grown from runners planted end to end in May of this year, and the growth shown in the illustrations had developed by the latter part of August, at which time the photographs were made. A much greater development would have resulted had the runners been set out in the nurseries in the fall of last year, and indeed it is recommended that the best results are obtained if the runners are set out in the fall and allowed a full year's growth when the planting of greens by the vegetative method is contemplated. The illustration on the reader's left is furnished us by Mr. Richard Paul, of the Interlachen Country Club, Hopkins, Minn.; the mass of runners has been lifted from the nursery bed preparatory to chopping up and use in planting a green. The illustration on the reader's right is furnished by Prof. C. J. Willard, of Ohio State University, Columbus, and is a view of a portion of the creeping bent nursery established at that institution for planting the athletic field of their stadium.

### Three Years' Work of the Green Section

The Green Section is now three years old and has issued a BULLETIN every month beginning with February, 1921. *The three volumes of THE BULLETIN thus far issued make up the most valuable literature in existence pertaining to golf courses.* That it is highly appreciated by those interested in the building and upkeep of golf courses, hundreds of enthusiastic

letters testify. The Green Section has taught golf clubs to do the right things and to discard expensive and disappointing methods. In this way it has been a source of great satisfaction and incidentally has saved the clubs much money. It is generally recognized that the formation of the Green Section was the greatest forward step ever taken to promote American golf.

At this time it seems appropriate that some of the specific accomplishments of the Green Section be reviewed, rendering, as it were, an account of its services to the clubs from which it derives its support.

*The Green Section as a Counselor.*—It may be pardonable to refer to the number of letters received and answered daily. Most of these letters ask advice, and they cover every imaginable problem that concerns the physical welfare of a golf course. If it were not for the fact that the same question is presented over and over again it would require a corps of supermen to answer them. It is hoped and believed that these letters are helpful. One of our oldest and most ardent golfers tells us, "The Green Section is such a great comfort"—a sentiment which we hope is generally felt.

*Worm Eradication.*—One of the subjects early investigated by the Green Section was commercial worm eradicators. Samples of the different brands which could be found on the market were purchased, analyzed, and tested for their effectiveness. Experiments with a number of chemicals not commonly used in commercial worm eradicators were also tried. The common commercial eradicators were found to owe their worm-killing properties to one of two materials—mowrah meal and corrosive sublimate. The former was most commonly used. Some of the mowrah-meal eradicators carried 20 to 60 per cent sand, while others were pure products. The prices charged were unreasonably high, ranging around \$175 a ton. After some experimenting it was demonstrated that pure corrosive sublimate was a most effective eradicator and could be bought at a price which reduced the cost of worming greens 85 per cent. Pure mowrah meal has been selling this past season as low as \$45 a ton. A statistician may be able to estimate what this saving means to the golf clubs of the country.

*Red Fescue.*—This grass has long held a high reputation for fine turf, perhaps justified by its behavior in other countries. Under exceptional circumstances good fescue putting greens are found in the United States, but they are very rare. After extensive experiments the conclusion has been forced upon us that red fescue has no great merit as a putting grass in America. Our former fairly high regard for this grass can no longer be justified, and hence for over a year we have advised against its use. Perhaps this has had something to do with the reduced price of the seed, which is now less than half its former price.

*Commercial Humus.*—This substance, due to its fine texture and intense blackness looks very alluring as a fertilizer. Its apparent richness however belies its real character. Not only is the fertilizing value of commercial humus low but in many cases it has proved positively harmful. Many instances have been noted where very poor turf resulted from a layer of humus just beneath the surface. Those who have endeavored to keep up their turf solely by top-dressing with commercial humus have secured poor results at best. The price of the product is entirely out of proportion to any value it might possess. Because of the advice given by the Green Section to use for top-dressings good rich soil reinforced with stable manure, it has been reported that the sales to golf clubs of commercial humus have fallen off more than half. This not only represents a saving in the cost of the material, but in most cases a still larger saving in the

future in not having to reconstruct the green to overcome the detrimental effects of the humus.

*Layer-Cake Greens.*—Building a green by making soil layers of different materials is as unwise a disregard of nature's way of doing things as one can imagine. But there have been scores of putting greens built after this manner, mostly with disastrous results both as regards the club's treasury and the growing of turf. The pathetic part of the whole business is that no one knows how to grow good turf on such greens without rebuilding them. The Green Section has kept some clubs from making this mistake, while others have had to learn from experience.

*Seeding on Old Turf.*—Prior to the organization of the Green Section it was customary to reseed putting greens and fairways every year. Some reseeded spring and fall, no matter how good or how bad the turf. There was plenty of evidence available that scattering more seed on old turf was largely a waste of money. By constantly stressing this point a large number of clubs have been induced to give up the practice entirely, making individual savings in some cases of from \$1,000 to \$5,000 a year.

*The Vegetative Method of Planting Grass.*—One of the outstanding achievements of the Green Section has been in connection with the vegetative planting of creeping bent. The preliminary work with this method had been performed by the United States Department of Agriculture before the Green Section was organized; but without the publicity given by THE BULLETIN directly to golfers, it would no doubt have taken a long time to come into general use. There had been five or six greens planted by this method prior to 1922. In the fall of that year about 125 greens had been planted vegetatively to creeping bent, and in 1923 over 600 have been planted. The discovery of the Atlanta strain of Bermuda grass and its propagation by vegetative methods, is greatly improving Southern putting greens.

*Cooperation.*—Much of the old mystery and secretiveness of green-keeping has been overcome. Instead of each man feeling that he has to guard his knowledge with as much care as his pocketbook, there is now a spirit of cooperation and mutual helpfulness among greenkeepers, which means a great deal to the profession. The greenkeeper with a little pet stock of secret formulas is having a lonesome time.

So, too, is the quack turf expert. It would be impossible to carry on work of this kind without creating some antagonism. It is, however, a source of much gratification that most dealers in golf supplies have been sympathetic with the work of the Green Section and that it is making for better understanding and more cordial relations.

*Future Work.*—In regard to the ends to be achieved, the work of the Green Section has but fairly begun. It is perhaps true that some of the major problems have been solved; but there are still enormous gaps in our knowledge. There is no likelihood that in the near future all the puzzles of turf growing will be cleared up. The task of educating golfers to follow proved ideas and to avoid untried or unsatisfactory methods is at best slow, and a continuing program of education is of the utmost importance. Some ideas must be emphasized many times before some men can be induced to give them consideration.

How far the Green Section has been a success is for its supporters to judge. This judgment will be the main basis for its continued support and, we hope, for its material enlargement. At present it is not possible to afford nearly all the help urgently requested.

## The Size of the Putting Sward

By C. V. PIPER

Broadly speaking, there are only four types of 1-shot holes. These are: (1) holes of about 90 to 140 yards the length of which calls for a relatively short high pitch shot; (2) holes of about 180 to 210 yards in length so constructed as to call for a long high shot if one is to reach the green from the tee; (3) holes of about 160 to 180 yards with an open running-up approach; (4) holes usually 225 to 240 yards with an open running-up approach. The essential difference between 1 and 2 as contrasted with 3 and 4, that is of the pitch-shot as compared with the running-up shot, is emphasized by a hazard of some sort in front of the green in the former, while in the latter there is an ample "approach." In common parlance the four types are often referred to as "mashie holes," "spoon holes," "midiron holes," and "driver holes," because of the club the average good player would probably use from the tee. This classification ignores the low back-spin shot which a small percentage of expert players can use successfully even on a "mashie hole."

The above ideas may be further extended to 2-shot holes. Most 2-shot holes are theoretically 1-shot holes plus a full drive from the tee. In 2-shot holes, however, the second shot is not from a tee. Even if the play from the tee has been perfect, it is proper that the second shot to the green should be relatively less difficult than a 1-shot hole of equal distance, because the player has not the advantage of placing the ball as he may prefer. There is no valid reason why 2-shot holes which demand two mashie shots, say 140 yards each, or two midiron shots, say 170 yards each, should not be used more; but such holes are rarely seen. Even holes that are more anomalous would add to the variety, as for example one demanding a 140-yard shot from the tee and then a 200-yard shot to the green. However, no matter what the combination of shots used from the tee to the green, the latter should be constructed in reference to the four types of holes first outlined.

It will probably be acknowledged by all who have given the subject reflection, that the putting sward of a 140-yard hole should be smaller than that of a 240-yard hole. "Putting sward" is used purposely, as the *putting green* is by definition the area enclosed by a radius of 20 yards from the hole, excluding bunkers. Many putting swards are smaller than this, and a few much larger. There are, however, some differences of opinion as to the most desirable size of the putting sward for each of the four types of 1-shot holes, which with some latitude should also apply to all 2-shot holes. The most important consideration is that the size of the sward should bear proper relation to the kind of shot required. An additional argument is used by those who favor large swards, namely, that the approach putt is one of the most trying shots in golf and, therefore, should be provided for; on the other hand it is argued that there are enough long approach putts even on moderate-sized swards, and that the shot from the fairway just outside the putting sward is even more trying. Another consideration dwells on the cost of upkeep, which increases in almost exact proportion to the size of the sward. A few students would have the putting swards of the last nine holes smaller than those for corresponding holes of the first nine.

There can be little question that the tendency in recent architecture has been to reduce the size of the putting swards. Indeed many clubs have

## Actual Sizes of Putting Swards on Twelve Golf Courses

Hole No.	The Apawamis Club, N. Y.			Rhode Island Country Club, Natick, Mass.			Columbia Chevy Chase, Md.			Cherry Hills Golf Club, Denver, Colo.			Inverness Golf Club, Toledo, Ohio.			Hollywood Golf Club, Deal, N. J.		
	Length yds.	Bye, N. Y.	sq. ft.	Length yds.	Bye, N. Y.	sq. ft.	Length yds.	Bye, N. Y.	sq. ft.	Length yds.	Bye, N. Y.	sq. ft.	Length yds.	Bye, N. Y.	sq. ft.	Length yds.	Bye, N. Y.	sq. ft.
1	377	3,600	366	366	3,600	366	4,537	383	4,948	383	4,948	383	385	6,880	7,030	426	7,030	426
2	350	3,350	397	397	3,350	320	3,069	400	6,820	400	6,820	382	382	5,950	5,950	360	5,950	360
3	325	2,400	349	349	2,400	370	4,876	316	3,583	316	3,583	185	185	5,950	6,920	420	6,920	420
4	325	2,400	349	349	2,400	370	4,876	316	3,583	316	3,583	185	185	5,950	6,920	420	6,920	420
5	325	2,400	349	349	2,400	370	4,876	316	3,583	316	3,583	185	185	5,950	6,920	420	6,920	420
6	325	2,400	349	349	2,400	370	4,876	316	3,583	316	3,583	185	185	5,950	6,920	420	6,920	420
7	405	6,000	443	443	6,000	443	5,043	360	4,746	360	4,746	320	320	6,000	6,160	515	6,160	515
8	177	6,000	471	471	6,000	471	4,000	220	6,803	220	6,803	220	220	6,000	8,910	375	8,910	375
9	600	6,100	431	431	6,100	431	5,089	379	5,098	379	5,098	346	346	5,200	4,860	510	4,860	510
10	335	6,000	234	234	6,000	441	6,293	448	6,293	448	6,293	359	359	7,200	6,490	400	6,490	400
11	340	4,200	509	509	4,200	448	6,792	205	5,484	205	5,484	523	523	6,120	5,400	350	5,400	350
12	203	4,500	299	299	4,500	437	4,043	302	4,740	302	4,740	150	150	5,600	5,610	175	5,610	175
13	260	4,500	397	397	4,500	400	5,089	437	4,447	437	4,447	410	410	6,875	5,360	230	5,360	230
14	520	3,200	325	325	3,200	368	4,015	115	4,804	115	4,804	430	430	6,875	5,360	230	5,360	230
15	215	3,900	399	399	3,900	138	4,000	265	4,128	265	4,128	332	332	4,250	8,460	405	8,460	405
16	490	5,800	135	135	5,800	410	8,093	445	7,252	445	7,252	410	410	107,610	116,680	6,420	116,680	6,420
17	295	8,000	384	384	8,000	410	8,093	445	7,252	445	7,252	410	410	107,610	116,680	6,420	116,680	6,420
Total	6,045	87,330	6,336	6,336	87,330	6,446	184,200	6,330	149,161	6,330	149,161	6,365	149,514	6,365	151,697	6,420	151,697	6,420

Hole No.	Kittansett Club, Mass.			Merion Cricket Club, Haverford, Pa.			Pine Valley Golf Club, J. Clementon, N. J.			Country Club, Brookline, Mass.			Chevy Chase Club, Chevy Chase, Md.			Indian Hill Club, Winnetka, Ill.		
	Length yds.	Bye, N. Y.	sq. ft.	Length yds.	Bye, N. Y.	sq. ft.	Length yds.	Bye, N. Y.	sq. ft.	Length yds.	Bye, N. Y.	sq. ft.	Length yds.	Bye, N. Y.	sq. ft.	Length yds.	Bye, N. Y.	sq. ft.
1	410	6,224	325	325	6,224	421	8,200	430	8,256	430	8,256	410	410	7,903	7,728	560	7,728	560
2	390	5,843	525	525	5,843	192	8,100	310	8,100	310	8,100	300	300	9,226	9,200	433	9,200	433
3	145	6,188	195	195	6,188	435	8,500	435	10,800	435	10,800	400	400	12,560	458	458	12,560	458
4	355	6,050	470	470	6,050	481	8,000	300	8,100	300	8,100	390	390	11,439	8,918	283	8,918	283
5	400	6,660	420	420	6,660	205	8,200	480	8,100	480	8,100	390	390	6,084	6,960	445	6,960	445
6	373	6,730	427	427	6,730	365	8,000	290	8,175	290	8,175	430	430	9,746	8,370	377	8,370	377
7	465	8,000	355	355	8,000	551	6,300	190	7,200	190	7,200	375	375	6,396	7,500	314	7,500	314
8	187	6,540	350	350	6,540	303	2,500	100	8,075	100	8,075	230	230	6,384	5,502	160	5,502	160
9	375	6,540	170	170	6,540	411	7,000	415	6,300	415	6,300	290	290	10,895	7,448	141	7,448	141
10	325	5,280	335	335	5,280	134	7,500	325	6,375	325	6,375	145	145	6,900	8,365	141	8,365	141
11	220	6,800	378	378	6,800	395	6,300	520	8,500	520	8,500	425	425	9,075	8,526	350	8,526	350
12	376	5,780	407	407	5,780	312	5,200	140	9,500	140	9,500	350	350	7,825	8,428	381	8,428	381
13	335	4,820	125	125	4,820	164	5,000	390	7,500	390	7,500	195	195	7,825	8,256	186	8,256	186
14	168	7,300	407	407	7,300	164	5,000	480	9,800	480	9,800	340	340	7,533	8,256	186	8,256	186
15	465	8,160	340	340	8,160	597	7,000	350	8,500	350	8,500	430	430	7,533	8,256	186	8,256	186
16	390	6,260	433	433	6,260	428	4,500	370	9,500	370	9,500	335	335	8,504	18,155	186	18,155	186
17	390	6,260	433	433	6,260	428	4,500	370	9,500	370	9,500	335	335	8,504	18,155	186	18,155	186
18	445	7,890	425	425	7,890	425	15,000	410	9,350	410	9,350	410	410	9,408	8,232	522	8,232	522
Total	6,194	117,610	6,410	6,410	117,610	6,446	184,200	6,330	149,161	6,330	149,161	6,365	149,514	6,365	151,697	6,420	151,697	6,420



thus modified their courses by reducing the areas of putting sward, leaving more or less of the periphery to grow grass of fairway height.

Putting swards of less than 4,000 square feet are often found, but the turf becomes punished too badly to make such small greens advisable. On the other extreme, swards of 16,000 square feet are occasionally used. The area of a circle of 20 yards radius—that is, the official “putting green”—measures 11,310 square feet, assuming that there are no bunkers in the circle. Factors which to some extent determine the most desirable size for a sward are the slope of the ground—that is, level, sloping toward the approach, or sloping away from the approach. The hardness of the soil sometimes enters into the problem. Another point that merits weight is the degree of “mental hazard.” Where this is great, the sward may properly be larger than usual. Sometimes a sort of double putting sward is used and so constructed that the player who is on the wrong part of the sward is no better off than one who is not on the sward at all.

All that which is written above refers to grass-covered putting swards. Where the swards are sand or oiled, quite other dimensions prevail.

The actual sizes of the putting swards on twelve golf courses may be of interest and are here tabulated. The same data were also requested from a number of other well-known clubs, but have not been received. Analyses of their sizes so far as type is correlated with area of putting sward, show wide diversities. The total area devoted to putting swards also varies greatly.

Some of these holes are not familiar to the writer; so there is doubt as to the type of play the design calls for. Holes built for long high shots are not very common; so in cases where the facts are not known it is assumed there is an ample approach to the green.

It is worthy of note that only four of the twelve courses have swards as large as 10,000 square feet.

**TOTAL AREA OF PUTTING SWARDS.**—The total areas of putting swards on these 12 courses range respectively from about 87,000 square feet to nearly 152,000 square feet. The average for the twelve courses is 117,781 square feet. If one may place dependence in averages, this total area of 18 swards is approximately what should be desired.

**AVERAGE SIZE OF SINGLE SWARDS.**—This is least at the Apawamis Club, where it is 4,852 square feet. It is nearly identical at Rhode Island and Columbia. It is largest at Indian Hill, 8,428 square feet. The average size of all the swards of all the courses is 6,544 square feet.

**HOLES 115 TO 155 YARDS LONG.**—Each of the 12 courses tabulated has at least one hole in this class. Chevy Chase, Country Club, Inverness, Cherry Hills, Indian Hill, and Rhode Island each have two. The smallest putting sward in the class is No. 16 at Columbia, 4,000 square feet; the largest is No. 4 at Chevy Chase, 11,439 square feet. In the entire series 18 holes are found in this class. The average size of the swards of these holes is 6,420 square feet.

**HOLES 160 TO 195 YARDS LONG.**—Nine of the 12 courses have holes in this class. Of these 9, Columbia, Kittansett, Merion, Pine Valley, and Indian Hill each have 2. Presumably most of these holes are designed to be played with a midiron, or at least not with a spoon. The smallest sward in the class is No. 13 at Columbia, 4,043 square feet; the largest is No. 13 at Indian Hill, 9,250 square feet. The green at Columbia slopes quite strongly to the approach. The average size of the swards of the 14 holes in this class is 6,389 square feet.

**HOLES 200 TO 235 YARDS LONG.**—Ten of the 12 courses tabulated each have at least one hole in this class, while Apawamis and Cherry Hills each have 2. Columbia and Country Club (Brookline) have none. The smallest swards in the class are No. 16 at Apawamis, 3,900 square feet; No. 10 at Rhode Island, 4,480 square feet; and No. 12 at Apawamis, 4,500 square feet. The largest is No. 9 at Chevy Chase, 10,695 square feet. The average size of the 12 swards in the class is 6,867 square feet.

**HOLES 290 TO 360 YARDS LONG.**—All such holes, it is assumed, are of the drive-and-pitch type. All the 12 clubs have holes in this class. Columbia, Chevy Chase, Kittansett, and Indian Hill each have 3; Cherry Hills, Hollywood, Pine Valley, and Country Club (Brookline) each have 4; Rhode Island, Inverness, and Merion each have 5; Apawamis has 7, without counting its 260-yard hole. The smallest sward in the class is No. 8 at Pine Valley, 2,500 square feet; the largest is No. 4 at Country Club (Brookline), 10,800 square feet. The average size of the 50 swards in the class is 5,722 square feet.

**HOLES 361 TO 500 YARDS LONG.**—Whether drive-and-pitch holes should be limited to 360 yards or should be allowed greater length, is open to question. However, most of the holes of 361 to 500 yards usually require more than a drive and a mashie shot. Among the 12 courses tabulated, there are 103 holes in this class, distributed as follows: Apawamis, 4; Merion and Indian Hill, each 7; Cherry Hills and Pine Valley, each 8; Rhode Island, Inverness and Hollywood, each 9; Country Club (Brookline) and Chevy Chase, each 10; Columbia and Kittansett, each 11. The three smallest swards in the class are each 3,600 square feet, being No. 13 at Rhode Island and Nos. 1 and 15 at Apawamis. The largest are No. 3 at Chevy Chase, 12,565 square feet; and No. 18 at Pine Valley, 13,000 square feet. The average of the swards in the class is 6,916 square feet in area.

**HOLES 500 YARDS IN LENGTH OR LONGER.**—All of the courses except Kittansett have at least one hole in this class. Apawamis, Cherry Hills, Hollywood, Merion, and Pine Valley each have 2. Indian Hills has 3. The smallest in the class is No. 14 at Apawamis, 3,200 square feet; the largest is No. 15 at Indian Hill, 10,185 square feet. The average size of the 18 swards in the class is 6,486 square feet.

It is dangerous to deduce conclusions from statistics alone, but the above data are certainly significant. As before stated, the desirable size of any particular putting sward depends on a number of factors, and unless one is familiar with all of them, any criticism is apt to be gratuitous.

Based on quite other studies than statistics, the writer believes the sizes of putting swards generally desirable are about as follows:

Mashie holes.....	4,000 to 6,000 square feet
Midiron holes.....	6,000 to 7,500 square feet
Spoon holes.....	7,000 to 8,000 square feet
Drive holes.....	8,000 to 9,000 square feet

On two-shot holes the swards may well be slightly larger or else not so closely guarded by bunkers, depending on the type of second shot called for after a good drive.

### Golf Clubs in Canada

According to Fraser's Canadian Golf Directory and Year Book for 1923, there are 358 golf clubs in Canada. Eighty-one clubs have 18-hole

courses and 77 have 9-hole courses. In 1916 there were only 76 golf clubs in the Dominion. The distribution of the clubs by provinces is as follows:

Alberta -----	51	Nova Scotia-----	14
British Columbia-----	26	Ontario -----	124
Manitoba -----	33	Prince Edward Island-----	2
New Brunswick-----	8	Quebec -----	62
Saskatchewan -----	38		

### Blue Lyme Grass

The use of "whiskers" on cops or in bunkers does not by any means meet with unanimous approval. Yet there are places on golf courses where coarse grasses are attractive and desirable. One such grass very commonly used is beach grass or marram grass. The grass here illustrated is a native of Siberia and botanically known as *Elymus sabulosus*. It has very attractive bluish foliage and does not make nearly as dense growth as does marram grass. It is thus both more attractive and less a menace to place. Roots of it will be available for Green Section clubs next year.



Blue Lyme Grass Growing in a Bunker at Pine Valley

The Green Section does not guarantee or certify the goods of any commercial dealers in seeds, fertilizers, machinery, or other golf course supplies. Beware of the dealer who states or implies that his goods have the endorsement of the Green Section.

### Should Putting Greens Be Kept Closely Cut at All Times?

(Unfortunately the following contribution from Mr. Macbeth reached us too late to be included in the discussions on this subject published in the November Bulletin. We are glad to present it here.)

"Cutting closely may lead to either good or bad results, depending upon conditions. I am sure no one with experience would advocate the discontinuance of close cutting during the growing season under the following conditions: On a new green, say a year old; on greens of mixed grasses of different textures; on the greens of clover and grasses of the warm climate of southern California. Really I do not think the problem greatly concerns us out here, as the dormant season is so short and the steady play which we have the year round makes it almost impossible for a greenkeeper to raise his cutter blades for a period long enough to show results. As you know, many of the greens here are regular 'Duke's Mixtures,' and one week with blades set up would show bad results and make a joke of good putting. For a good and matured turf with no coarse grasses in it, I believe it is decidedly beneficial to let the grass grow up a little in height. I had the idea last year that perhaps I could get a thicker growth of fescue by not mowing closely, but the redtop, *Poa annua*, velvet grass, etc., made the greens look so ragged that I had to lower the blades again. If there is anything in the theory that plants draw nitrogen from the air, then one would naturally think that the more leaf-surface there is the more nitrogen is gained and the better and stronger is the turf in the long run. For southern California, from my observation of the average greens, I would recommend cutting pretty closely all the time, unless the green can be put out of play for at least a couple of months."—*Norman Macbeth, Wilshire Country Club, Los Angeles.*

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### Earthworms Learning by Experience

*Science Service*

Earthworms have memory and may be trained in the way they should go, but their brains are not in their heads but in their abdomens. Professor L. Heck, of the University of Prague, has announced this discovery as the result of experiments with a collection of worms some five hundred in number. They were introduced into a passage shaped like a capital T and carved from a block of wood which was covered with a glass plate so that the movements of the little creatures might be observed. When they came to the junction about half of them turned one way and half the other.

Then it was arranged so that those that took the left-hand passage received a mild but presumably disagreeable electric shock. At first the worms did not know just what to make of all this, but after they had all been through the experience about two hundred times, they nearly all were converted to "safety first" and took the right-hand turn. When the electrodes were then moved to the right-hand passage they learned to shift to the other after only 65 passages, evidently showing more aptitude.

In the human sense, earthworms have no brains; their nervous systems consist of a series of little ganglions, or nerve centers, on the under side of the worms and connected with each other by nerve fibers. If the worms were cut in two, the fragments still showed the ability to distinguish between the safe and the unpleasant road to travel, showing that the earthworm remembers in every one of his ganglions, and is able to learn and profit by experience, which in spite of their higher organization many men are unable to do.

**New Member Clubs of the Green Section.**—East Shore Country Club, Culver, Ind.; Clovernook Country Club, Cincinnati, Ohio; Cincinnati Golf Club, Cincinnati, Ohio; Yorktown Country Club, Yorktown, Va.; Country Club of Birmingham, Birmingham, Ala.; Mt. Hawley Country Club, Peoria, Ill.; Del Monte Golf and Country Club, Del Monte, Calif.; Manasquan River Golf and Country Club, Brielle, N. J.

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

**Question.**—A player drove a ball from the tee, which he thought went out of bounds, and at once played a provisional ball. This shot was poor, as was also his second shot with the provisional ball, so that he did not reach the spot at which he thought his first ball went out of bounds until he had played three times with the provisional ball. On reaching the spot, he searched and found the first ball. I ruled that he should continue to play with the first ball. Was I right in thus ruling?

**Answer.**—You were entirely right. A player is entitled to continue to play with a provisional ball until he reaches the spot where his first ball is likely to be.

**Question.**—On the left of a certain fairway there is another fairway with its green and tee, now part of the playable course. Between the two fairways are boundary stakes. In the absence of any local rule, is a ball driven from one tee or fairway, over the boundary stakes and onto another tee, green, fairway, or bunker, or into a trap, out of bounds?

**Answer.**—The definition of out-of-bounds is, "all ground on which play is prohibited." In the absence of any local rule, it would therefore seem that a ball driven to the other fairway over the boundary stakes would not be out of bounds and therefore would be in play. The local committee, however, should make a ruling on this case.

**Question.**—The question arose as to whether a ball could be taken out of a bunker, with a loss of two strokes. I stated that the ball could only be taken out if it were in an unplayable position, and that the bunker was there just for the purpose of catching bad balls. Was I right?

**Answer.**—The player is the sole judge of whether or not his ball is unplayable. He therefore has the right to lift it any time under the rules.

**Question.**—Our "Round Table" is playing at different times for a cup. The player having the lowest net strokes for the 18 holes is to hold the cup until the next contest. Recently a considerable discussion arose as to whether a ball may be lifted from a bunker under two-strokes penalty. Personally I have no doubt about this, but I would appreciate your advice on the point so that the matter may be settled before the next contest.

**Answer.**—In medal play a ball may be lifted from any place, at the discretion of the player, and may be played as provided under Rule 22, for lost and unplayable ball, the penalty for which is stroke and distance; or it may be played as provided under Rule 11, special rules for stroke competition, the penalty for which is to tee the ball under penalty of two strokes.

**Question.**—In playing from the tee in match-play handicap, do strokes count in honor of playing? I have lately been advised that if strokes played were the same and opponent was given a stroke on the hole, it carried the honor with it.

**Answer.**—Strokes always count in the matter of taking the honor. It is the net number of strokes that the player takes at a hole that decides who has the honor in all cases.

## 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. Winter seeding.**—We are intending to reseed as soon as possible bluegrass greens that were heavily weeded during the past summer, intending to sow about 30 pounds of bluegrass to each green. These greens measure about 20 by 20 yards. We have had up to date a mild, dry winter, and there has not been any permanent frost in the ground for several weeks. Would we be making a mistake to sow the seed at this time of the year (January) so as to have it in the ground before a heavy snow, or should we wait until the growing season has actually started? (Missouri.)

We believe it would be perfectly satisfactory in your latitude, to sow your bluegrass seed in January.

**2. Playing on the putting greens in winter and early spring.**—The chairman of the Green Committee and I do not agree on one subject, and that is, when the course should be opened for play in the spring. Our course is laid in a valley composed of sandy soil, some boulders, and rocks, and it drains very quickly. Our season is about ten days behind that of Long Island. We believe we could keep our course open the year round without damage. I took great pains to inquire in England and Scotland last summer about the closing of their courses during the winter months when they had constant freezes and thaws, and found they never dreamed of stopping play at any time. Near here some courses with memberships of a thousand keep open all the time in spite of their clay soil with plenty of mud; they used to close years ago, using temporary greens, tees, etc., but have now given that up and find that their courses are not harmed in any way. Am I right in my belief that it does not do any harm to play right now (March)? Please give me your candid opinion and let me know what the custom is throughout the country. (New York.)

There is no valid reason for not using putting greens for play at any time of the year except when they are soggy from freezing and thawing or from other reasons. When they are soggy, heel-prints soon make the greens practically unplayable; and if they are played on, some injury to the grass may result. Whenever the moisture conditions of the greens are reasonably good there is not only no harm in using them for play, but there is evidence which even indicates that it is advantageous. In the clubs about Washington the greens are used throughout the winter except at times when they are soft and soggy from freezing or from excessive rain. On sandy-soil courses, even in New England, the greens may always be used in winter. On any type of soil it does no harm to use the greens when the moisture in the soil is not excessive.

**3. Grass for putting greens and for sand hills in Southern Florida.**—Will fescue grow on putting greens in Florida if it is watered throughout the year? Is there any grass which can be used for putting greens other than Bermuda

grass, which will stand this climate and give a better putting surface? Is there any grass which will grow in Florida on sand hills? (Florida.)

Pescue is useless in Florida. The best strains of Bermuda grass make excellent putting greens. Of these the best we have at present is the strain called Atlanta Bermuda. On some of the southern Florida putting greens the strain called Giant Bermuda is found; this is the coarsest of all strains and very unsatisfactory for putting greens. In the light of our present knowledge we believe that under your conditions the best you can do is to have permanent Bermuda greens; but you should use the best strain of Bermuda. Furthermore, it would be desirable to have some clay in your soil, as much finer Bermuda will grow on clayey soil than on sandy. There are quite a number of grasses in southern Florida that will grow on sand hills and help bind the sand together. Sea oat grass is one of these. If you can get out to the open shore, where the wind blows a good deal, you can find various grasses suited to the conditions and which will be splendid to use on the sand hills. A visit to the agricultural experiment station at Miami, Florida, might be helpful to you in this matter.

**4. Treatment of bent turf to produce a smooth putting surface.**—We planted several greens from creeping bent stolons, but the turf does not present a putting surface that is sufficiently smooth. Can you suggest a treatment that will overcome this objection? (California.)

The smoothness of creeping bent turf depends on the strain of creeping bent planted and on the frequency of top-dressing. The grass grows so rapidly under favorable conditions that until the stolons have rooted at each joint a rather loose mass develops. Frequent top-dressing encourages the rooting of the stolons at the joints. Without this treatment a year's time will probably be required before your turf will become firm and smooth, whereas by proper attention as regards top-dressing this result should be obtained within a few months.

**5. Use of cottonseed meal on putting greens.**—We have been advised by a company who sells fertilizers not to use cottonseed meal on our putting greens inasmuch as it will bring worms injurious to the grass. Does this fertilizer cause injury to the grass by encouraging worms and insects? (Florida.)

Our results with cottonseed meal have been in every way satisfactory, and we have never seen any evidence of its encouraging worms or insects of any kind. We do not know what the company means when they refer to worms. Certainly, cottonseed meal does not encourage earthworms, and used on putting greens this fertilizer does not, in our opinion, encourage any insects.

**6. Sawdust as a topdressing for putting greens; fertilizers to use on Bermuda grass.**—We are sending you a box of sawdust which has been rotted by placing in a low, wet place. We are using this as a top-dressing on our putting greens and find that it keeps the greens very soft. Has this material been used before for this purpose? What is the best fertilizer to put on Bermuda grass if used for our greens? Our natural soil is very hard and rocky red clay. (Georgia.)

Sawdust has been tried thoroughly from a fertilizing standpoint, and there is nothing to recommend its use. It contains but a mere trace of plant food, and this is not available until it has rotted for a number of years. Fresh sawdust is extremely dangerous to use. We have seen a number of instances where the ground has been ruined for years around a sawdust pile. The best results that we have obtained from fertilizers are by the



use of ammonium sulfate. This gives us a good growth of grass and discourages white clover and crab grass. As in your region you will probably not be very much troubled with white clover, you could probably use the less expensive cottonseed meal, which is a very efficient, quick-acting fertilizer.

**7. Seeding fairways in the North.**—What seed would you recommend to mix with redtop for fairway seeding? Can hay seed be used on a golf course? We are not clear as to what hay seed is. We are told hay seed could be used on a golf course which already had a turf. (Pennsylvania.)

The commonest plants for hay used in the northern part of the United States are timothy, which makes up about half of the hay crop, red clover, and redtop. Red clover and timothy do not make good turf. Redtop makes fairly good turf but is short-lived. Its value is primarily as a filler to slowly growing grasses, especially bluegrass. Generally speaking, the best mixture to seed on fairways in the northern part of the United States is Kentucky bluegrass, 4 pounds, and redtop, 1 pound, seeding the mixture at the rate of 150 pounds to the acre. There is no one seed or one seed mixture properly called hay seed. Any grass seed or mixture of grass seed sown to produce a hay crop might be called hay seed. On fairways of golf courses, however, one is not interested in the crop of hay produced.

**8. Normal size of green and width of fairway.**—We would like to know if there is any standard size for greens and would also like to know if there is any regulation width for fairways. (Maine.)

The usual turf green is supposed to be made of a size in accordance with the shot required to reach it, *i. e.*, a green which is reached by a small pitch shot has a correspondingly small area, while one which is reached by a wooden club shot is made larger on that account. The normal fairway is about 50 yards in width, and this of course varies with conditions.

**9. Hard fescue and sheep's fescue.**—What is the difference between these two grasses? (New York.)

Hard fescue differs from sheep's fescue in that the leaves are broader and stiffer. All the seed sold by seedsmen as hard fescue is in reality sheep's fescue. So far as we know, true hard fescue seed has not been available commercially.

**10. Turf grasses for Kansas; rates of seeding for greens and fairways.**—Will you please advise me with regard to a suitable grass to plant on a golf course. (Kansas.)

For your part of the country we would recommend for fairways 4 parts of Kentucky bluegrass and 1 part of redtop, using about 100 to 150 pounds of the mixture per acre. For the rough and on bunkers, sheep's fescue is excellent. For putting greens there is nothing better than the bents, which are known in the trade as Rhode Island bent, Colonial bent, and German mixed bent. Seed of any of these, if of good quality, will produce an excellent putting surface. The bent seeds are, however, very scarce and high in price. Next to be preferred to the bents we would recommend a mixture of 4 parts of Kentucky bluegrass and 1 part of redtop, seeding this at the rate of 3 pounds per 1,000 square feet. This mixture does not produce anything like as desirable a turf as the bents, nor is there any other grass that will do as well. Red fescue is very often sold for putting green purposes, but it is our experience that it will not survive under your conditions.

## Meditations of a Peripatetic Golfer

A green built by putting four inches of very sandy soil mixed with commercial humus on top of a cinder layer 6 to 9 inches thick. No wonder the grass refused to grow.

Too much manure can be as unsatisfactory as none at all.

It does not take much ability to lay out a mediocre golf course. To design one of great merit requires skill of the highest degree.

About five per cent of the people think; the other ninety-five per cent tend to believe everything they read. People with things to sell, advertise to reach the ninety-five per cent. Too many golf course managers are in the ninety-five per cent class.

Should Chewings' fescue be planted in September or in April? It really makes little difference. The results are usually disappointing anyway.

Sand on a clay course should be synonymous with danger. Therefore make it visible. Such a hazard which is not visible loses ninety per cent of its effectiveness.

It is wonderful how much abuse grass can withstand. If this were not true many golf courses would be bare.

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### "Ten Commandments of Golf Architecture"

(Said to have been found in the tomb of Tutankhamen.)

Thou shalt not

- build blind holes;
- build undrained greens;
- make putting swards too large or too small;
- construct invisible bunkers;
- make rectangular tees;
- build more than one water-hole on a course;
- follow models slavishly;
- build 3-shotters just to get yardage;
- strive to penalize the duffer nor make the way easy for the crack;
- build holes that spoil the beauty of the landscape.

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### New Year's Resolutions for Greens Chairmen and Greenkeepers:

- I shall write to the Green Section when I am in doubt.
- I shall provide ample compost beds.
- I will have a grass nursery of the best strain for my course.
- I shall see that the cups are changed daily.
- I will keep all machines in the best of condition.
- I will see that drainage everywhere on the course is ample.
- I will not buy seed mixtures.