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

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A MONTHLY PERIODICAL TO PROMOTE THE BETTERMENT OF GOLF COURSES

CONTENTS

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, OF THE BULLETIN OF THE GREEN SECTION OF THE U. S. GOLF ASSOCIATION, PUBLISHED MONTHLY, AT WASHINGTON, D. C., FOR APRIL 1, 1925.

District of Columbia, ss:

Before me, a notary public in and for the District of Columbia, personally appeared W. B. Lydenberg, who having been duly sworn according to law, deposes and says that he is the business manager of the Bulletin of the Green Section of the U. S. Golf Association, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are:

Publisher, Green Committee of the U. S. Golf Association, 2908 South Dakota Ave., N. E., Washington, D. C.

Editors, C. V. Piper and R. A. Oakley, P. O. Box 313, Pennsylvania Avenue Station, Washington, D. C.

Managing editor: none.

Business Manager, W. B. Lydenberg, P. O. Box 313, Washington, D. C.

2. That the owners are the United States Golf Association, a mutual organization of golf clubs. Pres., W. D. Vanderpool, Newark, N. J.; Vice Pres., R. A. Gardner, Chicago, Ill., and W. C. Fownes, Jr., Pittsburg, Pa.; Sec'y, H. H. Ramsey, 110 E. 42d St., New York, N. Y.; Treas., E. S. Moore, Roslyn, N. Y.

3. That the Association has issued no bonds, stocks, mortgages, or other securities.

(Signed) W. B Lydenberg, Business Manager.

Sworn to and subscribed before me this 1st day of April, 1925.

(Signed) BERNARD CONNOR.

My commission expires August 6, 1927.

Coming District Green Section Meetings.

A general invitation is extended by the Cleveland District Golf Association to all interested in greenkeeping problems to attend their Equipment Demonstration Day on May 25, at Pepper Pike, Cleveland. The program includes the demonstration of 30 to 35 pieces of equipment, a picnic luncheon, and discussion of greenkeeping problems. An attendance of at least 200 is expected. Interested parties may communicate with the Cleveland District Golf Association, 611 Hunkin-Conkey Building, East 12th Street and Walnut Avenue, Cleveland (telephone Cherry 3933).

A General Green Section Meeting will be held by the Chicago District Golf Association at 2 p. m., June 8, at the Indian Hill Club, Winnetka, Illinois. Dealers and manufacturers are invited to have their equipment tested and demonstrated at this meeting. Samples of different strains of bent grass will be shown, and greenkeeping problems in general will be discussed. All interested are invited to attend. Further details may be obtained from Mr. Leonard Macomber, Active Chairman, Green Section, Chicago District Golf Association, 30 North Michigan Boulevard, Chicago (telephone Dearborn 3590).

A Green Section Meeting of the Central Illinois Country Club Association will be held on the afternoon of June 22. Details may be obtained from Mr. Ross P. Seaton, Country Club of Peoria, Peoria, Illinois. Interested parties are cordially invited to attend.

Covering bare banks.—Often banks are found so steep that the local plant growth will not cover them. There are two creeping vines which give splendid results in covering and holding steep banks. These are the Japanese honeysuckle and the creeping rose (*Rosa wichuriana*). These may be purchased from nearly all nurserymen. They should be planted at the top of the bank and allowed to spread downward. It is well to stick short brush into the bank, to hold the soil, until the vines become established. If it is desired to cover the bank with grass, the slope of the bank should be altered so it will be as gradual as possible, and a good top soil put on.

Ammonium Sulfate and Ammonium Phosphate

Numerous inquiries seem to show that the function of these two substances for use on bent putting greens is not clearly understood by many greenkeepers. The two behave very much the same, but the ammonium phosphate is somewhat more efficient as measured by the quality of the turf. This is the only phosphate that should ever be used on putting greens. All other phosphorus compounds stimulate the growth of white clover, never a desirable plant on putting greens.

Both of these ammonium salts have three functions:

(1) They are fertilizers, especially supplying nitrogen.

(2) Unlike all other nitrogenous fertilizers, they make the soil progressively more acid. This is highly important, because when the soil reaches a certain acidity clover, chickweed, crab grass, and other weeds will disappear and will not again invade the turf provided the soil is kept properly acid. Lime, bone meal, etc. will counteract this desirable acidity, and therefore should never be used on a putting green, as if the acidity is conteracted weeds will at once become troublesome again.

(3) With the continued use of either of these ammonium salts, earthworms and grubs will cease to be troublesome.

The second and third of the three results can be obtained by the use of these two ammonium salts and by no other fertilizers.

The only other important treatment is regular topdressing at least twice a season but preferably once a month. Use one cubic yard of dressing to a green, no more. This makes a very thin dressing, but enough. The material should be of the consistency of a light loam, so that with brushing it all disappears in the turf. It may be simply a good top soil, or a compost made of soil, sand, and well-rotted manure. The manure should not be used to excess, never more than one-fifth of the mixture; if more is used, earthworm trouble will follow.

The above method for maintaining putting greens is the best known up to date, based on a very large series of experiments, in which practically all fertilizers have been tried.

The soil of a putting green is properly acid when white clover disappears. If this acidity is maintained, clover, chickweed, crab grass, etc. will not again invade the turf. Until this acidity is secured, the ammonium salt should be applied every week. The length of time necessary to secure the desired end will vary according to the soil. If the soil is already neutral or slightly acid the end will be attained in one season or less. If the original soil is alkaline a longer time is required; but eventually the top soil will be made acid.

Ammonium sulfate or ammonium phosphate may be used at the rate of 5 pounds per 1,000 square feet (about 30 pounds per putting green) during cool weather in spring and fall. As the weather gets warmer the application should be reduced. In hot weather do not use more than 2 pounds per 1,000 square feet. The material may be applied dry either alone but preferably mixed in the topdressing, or as a liquid solution. *In warm weather it must be watered in thoroughly or the grass leaves will be burned.* In early spring and late fall there is very little danger of burning even if not watered in.

Experiments are under way seeking for a method to acidify soil in advance of seeding a planting. As yet this much-to-be-desired end has not been attained.

Improvements in the Method of Treating Golf Greens for the Control of the Japanese Beetle [1]

By B. R. Leach

Contribution No. 4, Japanese Beetle Laboratory, Bureau of Entomology, United States Department of Agriculture.

During the past three years the writer has published several papers[2] in the BULLETIN OF THE GREEN SECTION discussing certain facts with regard to the Japanese beetle and its relation to golf courses and the methods developed at this laboratory for the control of the insect in turf. This paper may be considered as a brief report on the insect's activities during 1924 together with a short account of certain improvements in methods of control of the grub in turf.

The Japanese beetle now infests an area of 5,122 square miles in New Jersey, Pennsylvania, and Delaware, an increase of 2,680 square miles as compared with 1923. While the greater portion of this area is as yet only slightly infested, the central portion of the area is heavily infested. That the area of heavy infestation is becoming larger is evidenced by the fact that it was necessary to apply control measures for the grubs on four

Figure 1.—Proportioning machine for regulating the strength of a solution.

New Jersey golf courses in 1924 as compared with two in 1923. Two of these courses are 10 miles apart. The beetle is present in certain golf courses in Pennsylvania near Philadelphia but not in sufficient numbers to cause injury to the turf of the greens.

The officials charged with the maintenance of the infested golf courses neither fear the Japanese beetle nor anticipate losses as serious as those formerly. The hysteria of three or four years ago has largely given way to the realization that with intelligent supervision the grub can be controlled at a reasonable cost. It is necessary to determine the degree of infestation in the greens; when the grubs are present in sufficient numbers a green must be treated before they impair the quality of the turf. If this

[1] In this article the author presents a digest of his address given at the Annual Meeting of the Green Section January 9, 1925.

[2] See especially "The Japanese Beetle; Its Life History and Control in Golf Greens," BULLETIN OF THE GREEN SECTION OF THE U. S. GOLF ASSOCIATION, Page 262, October 22, 1923.

is not done the turf will be injured and often completely ruined. Such an experience is usually a sufficient lesson to emphasize the necessity of treating at the proper time.

Figure 2.—Applying carbon disulfid emulsion with a nozzle designed especially for the purpose.

The actual operation of treating the turf of golf greens with carbon disulfid emulsion has been decidedly simplified as a result of further experimental work during 1924. The simplification of the treatment is due to the invention of a proportioning machine (figure 1), costing about $65, which eliminates the use of tanks, engines, and pumps. This machine was invented by Mr. G. Gordon Urquhart, a chemical engineer of Philadelphia. It enables two men to perform the work done by five men with the former cumbersome outfit.

This invention utilizes the principle that water under pressure flowing through a pipe can be made to create a suction. The water flowing from the hydrant, through the apparatus, sucks up the stock emulsion from the container. The emulsion mixes with the water, at a rate regulated by a needle valve. The resulting mixture (1 quart of stock solution to 50 gallons of water) is then flowed onto the green through a length of ordinary rubber hose 1 inch in diameter. A special nozzle devised at this laboratory flows the liquid over the turf (figure 2). The rate of water flow is controlled by a water meter, pressure regulator, and pressure gauge. Fifty greens were treated with these machines in the fall of 1924 with very satisfactory results. From present indications this machine will have an extensive application in the treatment of greens and lawns for the control of grubs.

The work in 1924 has further shown that the turf of greens can be treated satisfactorily with 1 quart of liquid per square foot instead of 3

pints as was formerly recommended, provided the turf is maintained in a moist condition for 7 days prior to the application of the emulsion. When this is done the grubs will remain near the surface. This procedure lowers the cost of the treatment proportionately and eliminates in a large measure the surface burnings which often occurred, especially in hot weather, when the heavier applications were made. The lighter application will not suffice unless care is taken in maintaining the turf in a moist condition prior to the treatment. The liquid should be applied in two portions, the second immediately after the first has soaked into the turf.

The Putting Green

With most golf players, the quality of the putting greens of a course determines one's estimate of its excellence. If the greens are good, the course has much merit; if they are bad or indifferent, no word of praise is forthcoming—"rotten" is usually the term employed. However we may regard the judgment of the player, the fact remains that he is never satisfied if the greens are poor, no matter how excellent the rest of the course may be.

From this trait of the player it follows that the first consideration of the greenkeeper must be to secure and to maintain putting greens of high quality. If with a reasonable amount of funds he can not accomplish this end he does not deserve his job. There are very few valid excuses for the turf on putting greens going bad. For the moment the only one that comes to mind is brown-patch; but with due care this can be avoided, or at least its effects greatly minimized.

First-class putting greens can be established and maintained in perfect condition everywhere in the United States where bent grass succeeds. The method is easy: (1) drainage; (2) a few inches of good top soil; (3) ammonium sulfate for fertilizer, and used freely as long as clover appears in the turf; (4) an occasional top-dressing of good compost, best applied monthly during the first two years. The green may be sown to South German mixed bent seed, or, better, planted with stolons. It is astonishing how quickly this method makes a green of superb quality. It is astounding how quickly the same green will deteriorate from neglect or if any other known method is used. These facts ought to be known and appreciated by every greenkeeper.

It is quite proper to judge a greenkeeper by his greens. It is a very rare case where he can prove an alibi for poor turf on his greens. In nine cases out of ten where the turf is bad he has done some foolish thing by way of experiment. The regular putting green is not the place to experiment, except perhaps a little spot on the edge of the green where possible injury to the turf will not be disastrous. Good greens do not necessarily mean expert greenkeepers, but bad greens practically always mean inefficient greenkeepers.

Welcome to the Grass Turf Plots.—When you are in Washington let us show you the grass turf plots at Arlington. It will be no trouble to us, but a pleasure. You will be welcome and interested. If possible, arrange date and time in advance. Come to room 7213, Building F, 7th and B Streets Northwest.

Art in Golf Architecture

By Max H. Behr

"The Meditations of the Peripatetic Golfer," in a recent number of THE BULLETIN, have led the Peripatetic Golfer to quote Goethe: "Art is long and time is fleeting." He adds the remark that "if time keeps on fleeting, another hundred years should reveal that it takes a real artist to make a golf course a thing of beauty." Whoever is the author of these pointed observations has here offered a challenge to a phase of golf architecture which is still in course of realization. And it is so, because we are too apt to mistake that which is pretty, or picturesque, for the beautiful. Prettiness, although pleasing, is a transient thing incident to the fancies of the moment; but beauty rests upon the fundamental,—its lineaments are the surface revelation of a perfection that lies beneath. Where beauty is lacking there must likewise be a lack of intelligence. Indeed, beauty may well prove to be the economic solvent to that continual evolution in the way of innovations and alterations to which most all golf courses are subject. If the holes have been most advantageously routed in the beginning, beauty should then be the ideal to be striven for in construction, for beauty practically always accompanies economy of structure. When we perceive it, we first become aware of truth; and only in the presence of truth do we recognize stability and permanence.

What, then, is art in golf architecture? What are the values we should seek to achieve it?

If we analyze golf architecture in general, we shall discover that, wherever beauty manifests itself in the necessary modifications of the ground, wherever the work done seems inevitably to be so, we can be relatively sure the work promises to endure. Experience has taught us that golf courses constructed with no higher end than merely to create a playground around which one may strike a ball, present the golfer with no more than a landscape brutalized with the ideas of some other golfer. That work of this kind should come, in time, to be picked to pieces is only what we should expect. Every golfer, whether he has a right to them or not, has ideas of his own upon the subject. And this is so because golf is an emotional adventure, and it is the emotions of man that fertilize the seed bed of his ideas. It is only reasonable, then, that the history of every artificial appearing golf course should be one of continual change. But, if we look closely, we shall find that these changes rarely involve natural hazards,—unconsciously, the veriest tyro at golf realizes he is contesting with Nature, and where he meets her unadorned, unblemished by the hand of man, he meets her without criticism.

If this be true, then indeed it behooves us, even if at all times we can not succeed in creating the beautiful, at least to achieve the semblance of the inevitable where we must impress our ideas upon the stubborn natural material to lend it to the playing of golf. We can not, obviously, proceed to lay our law upon the ground regardless of geological law which, in the first place, is responsible for its conformation. Golf architecture is not an art of representation; it is, essentially, an art of interpretation. And an interpretative art allows freedom to fancy only through obedience to the law which dominates the medium, a law that lies outside ourselves. The medium of the artist is paint, and he becomes its master; but the medium of the golf architect is the surface of the earth, over which the forces of nature alone are master.

In golf architecture, then, we are in the presence of an art closely akin to landscape gardening. What are the requisites to perfection in this art? Repton, the great landscape gardener of the XVIIIth Century, has perhaps most concisely and perfectly stated them.

"First, it must display the natural beauties and hide the natural defects of every situation. Secondly, it should give the appearance of extent and freedom by carefully disguising or hiding the boundary. Thirdly, it must studiously conceal every interference of art, however expensive, by which the scenery is improved, making the whole appear the production of nature only. And fourthly, all objects of mere convenience or comfort, if incapable of being made ornamental, or of becoming proper parts of the general scenery, must be removed or concealed."

It may never be possible to live up to such an ideal in golf architecture. In our endeavors to create a beautiful bit of nature, there are tees, greens, fairgreens, bunkers and the rough to be considered. Nevertheless, where it is necessary to make changes in the earth's surface to create these features, their lines and gradations can be made to seem as if they had always been, and their civilized aspect, because necessary to golf, will not be an affront to the beauty they reveal. And this will, more and more, become incumbent upon us to do, for the golfer of the future will demand of a golf course that "relief to be found in the æsthetic pleasure to be derived from landscape which expresses not man's will but the operation of natural forces."

Every modification of the ground must then be an individual problem by itself. And, to succeed with each, the golf architect must work in the spirit of the landscape gardener. He is not a perpetrator of ideas regardless; his ideas are inspired by and result from the most intimate perception of each actual bit of ground with which he has to do. His rearrangement of its surface must reveal that which appears real. Thus his ideas can not be subject to his own will, but must be subject to the natural operation of laws that lie outside himself; and he can be only successful if, in visualizing what is to be, he, in imagination, works with the tools of Nature, the elements. Of these, inland, undoubtedly the most influential is the erosion of water; by the sea, in links land, wind is perhaps the major molding element. An apt illustration of the proper use of one of these would be in work done abutting upon running water. If the life represented by this element in motion is not projected into the modifications of the ground by one, or a number, of the multifarious forms it occasions, and thus made to seem responsible for the new dispensation, the chances are the work will appear artificial. Therefore, in the prosecution of his designs, if the architect correctly uses the forces of nature to express them and thus succeeds in hiding his hand, then, only, has he created that illusion which can still all criticism.

In its broader aspects, golf architecture has always been an interpretative art; that is, courses have always been laid out taking as much advantage of the topography of the ground as possible. But, at this point, the vision of what is to be usually ceases—it is so easy to retreat within the order of the mind and escape the disorder of nature. And what is the result? Simply the imposition of ideas upon situations which are in no way fitted by nature to receive them; whereas, if the architect had continued as he commenced, endeavoring to perceive how it would be possible to render order out of disorder and yet make the result appear the action of natural forces, he would be, as he should be, an artist.

It must be evident that there are two methods in which golf architecture is pursued. In the one we see the architect, with plastescine or contour lines, inventing regardless of the nonconformity of situations to his ideas; and, thus, feeling himself free to modify the ground to his will, it is his destiny to be in bondage to the winds of fashion and reflect in his work the psychology of his time. Driven by a self-complacency in his omnipotence, the bark of his architecture, without the rudder of geological law, must drift from one fallacy of design to another. Only thus it would seem that "freak" architecture can be explained.

But the golf architect who looks upon his work as a true art will ever be humble, for his search is beauty. With so high a purpose, his *will* is ever subservient to his quest. It becomes the handmaid by which he brings to fruition his intuitions of truth. He must first feel before he thinks. And thus with no matrix of irrelevant ideas to dim his sight, he, with innocent eyes, perceives the forms of nature and rearranges them as they might once have been, or anticipates what they are to be, blending with his work that modicum of necessity that golf demands.

But when the laws of the medium, the surface of the earth, are made light of, from which alone true architecture can spring, its body becomes diseased and is subject to the inroads of parasitic ideas. Sand is now being used, not solely for its legitimate purpose—a hazard, but as a species of lighthouse to guide the player in estimating distance. Thus a crutch is thrown into the landscape upon which the eye of the golfer may lean, and the hazard of indeterminate space is to that extent mitigated. And greens are now being purposely tilted toward play, and enfeebled skill rejoices. The upshot of such an unsubstantial philosophy of golf must be to reveal every feature of nature; and, with nature robbed of its mystery, golf must degenerate to a *battue*, as have certain other sports, such as shooting, where birds and animals are driven down the muzzles of the guns. And thus true golf, an heroic and adventuresome pastime of the spirit, must become a mongrel, a cross between a sport and a game.

And this abortive philosophy of golf would seem to be sustained by that stricture of the Peripatetic Golfer, "All hidden architecture is bad." Should the golfer, in all cases, become immediately aware of what his fate is? Is golf to be robbed of all illusion? Is the walk between shots to be, only, either a tragic or a dull affair? *Does not the very essence of a sport lie in that suspense between the commencement of an action and the knowledge of its result?* Is it not this suspense that, in hunting, shooting, fishing, and in all sports, sublimates the mind and heart into a region of no knowledge, a region where, for a moment, we are permitted to dream impossible things and become heroes? In games we satisfy the physical demands of our bodies and the quick objective use of our senses, but in sports it is the nourishment of the imagination that makes them so lovable. In a game, we are face to face with a duplicate of ourselves; but, in a sport, we stand before the great unknown, wooing her with the virtue of our skill, hoping to be enfolded within her arms, but never sure that at the end we shall not find ourselves outcast. Surely, the maid of our heart should not reveal all her charms to us at once.

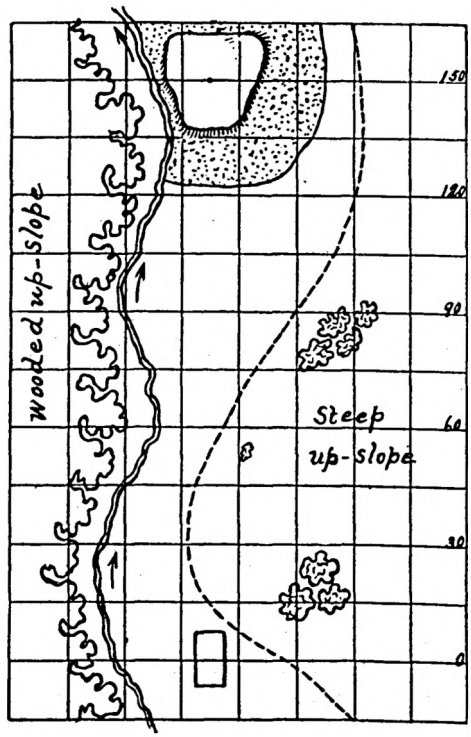
Leaf mold.—This is a splendid material to use in a compost mixture, and that is the way it should be utilized. Mix it with top soil and well-rotted manue. The longer this compost pile is allowed to stand, the bettter.

Power from Small Streams

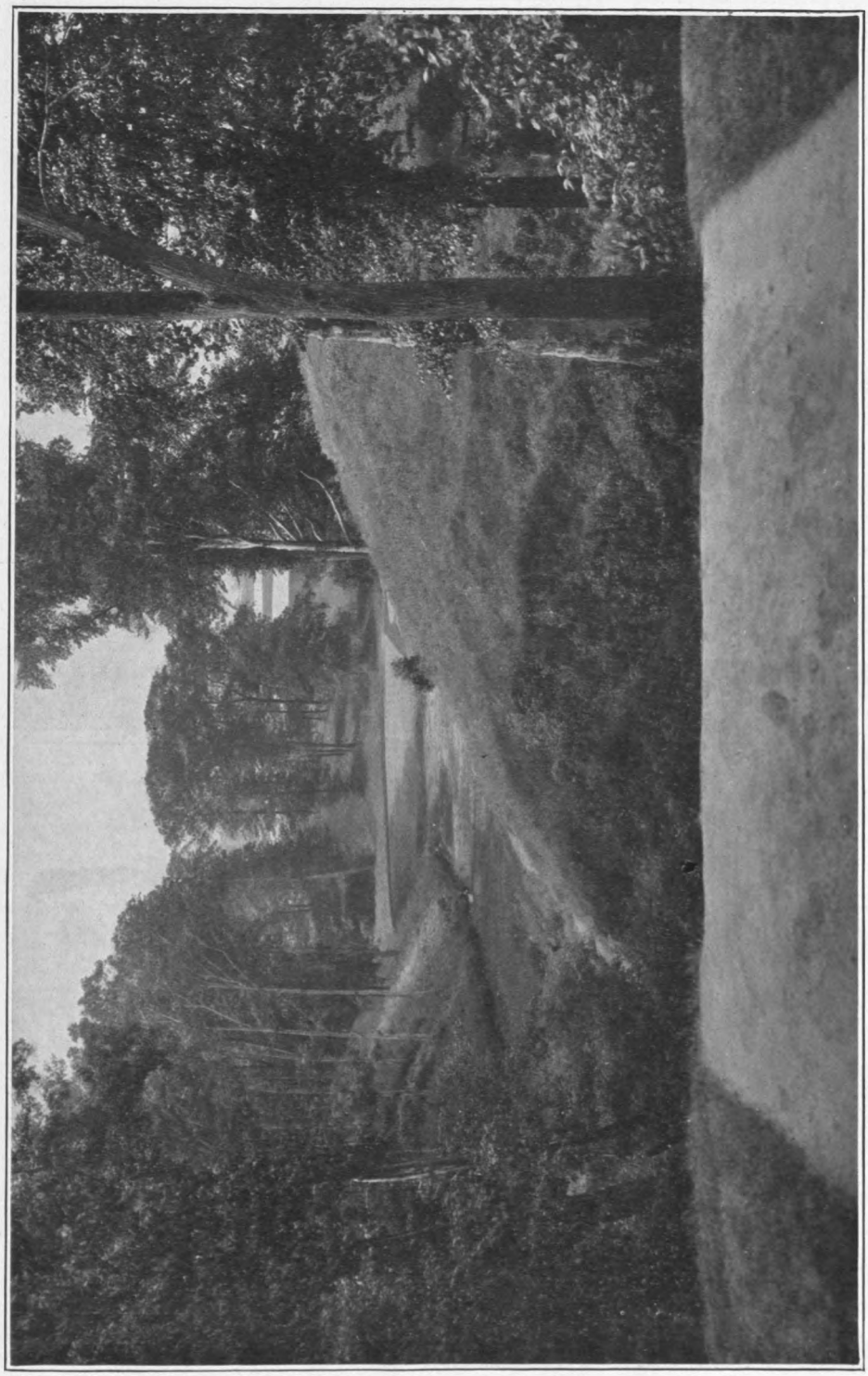
Many fail to realize that small streams are frequently sources of power which may be utilized in generating electricity to light buildings and grounds and possibly to operate a number of small machines. Electrical equipment on a golf course saves time and labor. If it is to be a sound investment, of course the cost of installation should not be greater than the benefits obtained will justify. In this respect water-power electric outfits may have certain limitations. It is nevertheless certain that under some conditions the utilization of water power from streams on golf courses should be a paying proposition. The United States Department of Agriculture has recently issued its Farmers' Bulletin No. 1430, entitled "Power for the Farm from Small Streams," which may be obtained free upon application to the Department of Agriculture. This bulletin discusses the possibilities of developing power from small streams by converting it into electrical energy, the methods of determining how much power a stream will supply, and methods of computing the approximate cost of installing a plant suited to the power available.

Instructive Golf Holes XV

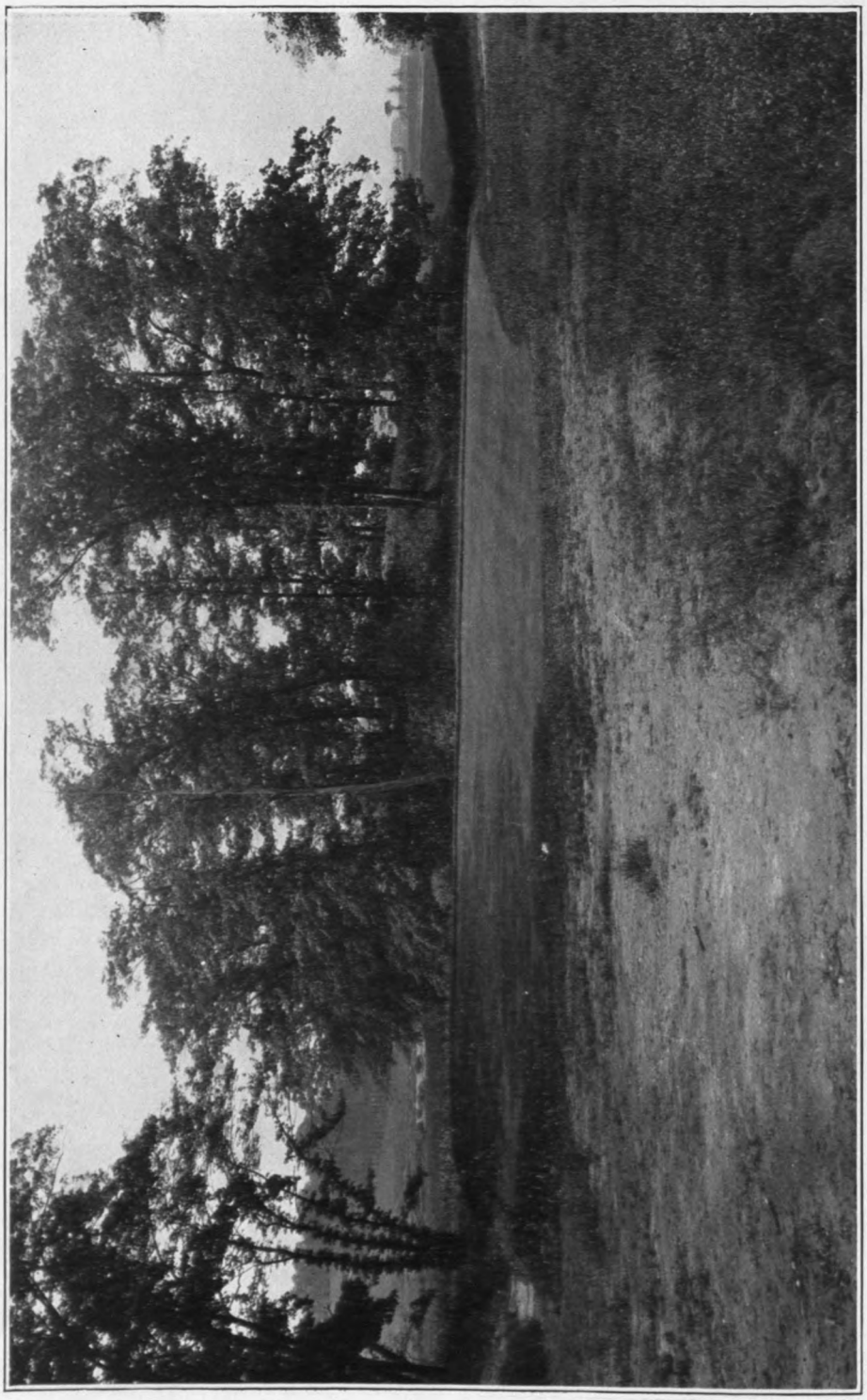
No. 7, Metacomet Golf Club, East Providence, R. I. (150 Yards)



A spectacular and picturesque hole down a deep canyon-like gorge through which winds a narrow brook. The tee is about 30 feet higher than the putting green. The direction is southwesterly. The natural hazards are evident from the illustration. Surrounding the front and sides of the putting green, which is about 5,500 square feet in area, is a waste of sand about 20 yards wide. Behind the green is a marsh.



Hole No. 7, Metacomet Golf Club. View from tee.



Hole No. 7, Metacomet Golf Club. Close-up view of putting green.

The Needs of the Green Section [1]

By Walter S. Harban

I have enjoyed this entertainment for the last couple of days because I have been sitting in the audience and listening to other people talk and do the work. I thought I was going to escape having to say anything at this meeting. But I am glad to add a few words in regard to those fertilizer plots at Arlington about which Dr. Oakley has told you.[2] What he has told you is a very true story. Of course Dr. Oakley gets to the plots much more frequently than I do, and he can see the effects from day to day; my visits to the plots are usually only about once a month. You would be amazed, upon examining those plots, at the variation in the weed production resulting from the treatment with certain fertilizers. Now he told you that on the nitrate of soda plot he got the goose grass. I saw that particular plot early in September, I think, and there was hardly anything there but goose grass. It was literally covered with it; but in the ammonium phosphate plot right alongside of it you could hardly find weeds of any kind.

Those experiments are exceptionally interesting, and I would advise any of you gentlemen who have an opportunity while in Washington to go to Arlington, having one of the gentlemen connected with the Department in this work go with you. They are always glad to do so and glad to show their work and the results. Of course, when I left home, there were about six or eight inches of snow on the ground, and I expect it is there and will be there nearly the rest of the winter; but May, June, July, August, September, and even October are the months in which you want to see the turf experiments at Arlington. Like all other turf, especially if the weather is cold, it naturally looks a little ragged before it has gotten a start in the early spring. At that season you do not get the effect of these various fertilizers, nor the results. Bent starts with us rather late, and until we get warm weather it does not respond quickly, and much before May or the latter part of May you do not get the beautiful effect of these combined plots. I do not think there is anything I can add to what Dr. Oakley has said regarding these plots or regarding that work, but I think that if in the months of the middle of the summer, when we get most of the weeds, you would visit this station and see the effects of certain fertilizers like nitrate of soda, bone meal, or manure, and things of that kind, and see the result as regards weeds, you would go home and stop using these materials on your putting greens.

Before I sit down I want to say one word regarding the Green Section Endowment Fund. Living in Washington and being associated with Dr. Piper and Dr. Oakley in their work, I come in contact with them very much more frequently than many of you do. Gentlemen, you do not appreciate the amount of work which these men are doing for you while in addition they are performing their duties for the Department of Agriculture, which are enormous. Hours when they should be at recreation or which should be taken for ease, they are devoting to your services. It is essential that they should be relieved of much of this detail work. That must be apparent to all of you; but it is far more apparent to me. Personal-

[1] Address delivered at the Annual Meeting of the Green Section, January 10, 1925.
[2] Reference is here made to the fertilizer experiments described by Dr. Oakley in his article on page 50 of the BULLETIN, March, 1925.

ly I know that these gentlemen are not in robust health, and it is asking a lot of them to continue under our present form, under our present methods, with so little help as they have for carrying on the work. That we are going to put over this Endowment Fund I have not the least doubt. It means that when we get home it should be the duty of every one here and every one at home who has a club and is anxious to improve conditions, anxious to keep up this Green Section work, to get in among their members. And I think there is hardly a golfer belonging to your clubs who would not be willing to come forward in the same way, at least to create this fund and, for that matter, to over-produce what we want. We have been told that there are 4,000 clubs in this country. We have been told that there are two or three million people playing golf in this country today. We ask for only a million dollars; and some say we are asking too much. If one-third of the golfers of America today would send one dollar, or contribute it to their club and have it sent to Mr. Moore or Mr. Blaine, you could readily see how easy it would be to raise this fund. Now gentlemen, I hope we are all going home imbued with the idea that we are going to raise the fund and put it through, and that we are going to do great work in the future.

Boost the Green Section Tournament May 30.—This is the way Mr. F. M. Masters, chairman of the green committee of the Country Club of Harrisburg, Pennsylvania, did it when the tournament of last October was held. On his greens newly planted with creeping bent stolons he displayed the following printed poster:

GREEN SECTION, U. S. G. A.

Made This Possible

Started to rebuild	Aug. 25, 1924.
Bent stolons planted	Sept. 2, 1924.
Green put in play	Oct. 18, 1924.

Enter the Green Section Tournament
Saturday, October 25.

Bluegrass and acid soils.—Since the announcement of the results of our experiments indicating the favorable response obtained with acid-reacting fertilizers in stimulating the growth of creeping bent grass and discouraging the growth of weeds, the question has naturally arisen as to the reaction of bluegrass to soil-acidifying fertilizers. We are starting a series of experiments this spring to determine the reaction of bluegrass to acid fertilizers. Nevertheless we have no evidence that would lead us to alter our opinion based on a limited number of experiments, that neither lime nor any other alkaline-reacting fertilizer is beneficial to bluegrass. One thing however is certain, and that is that while bent grass can be made to thrive on poor soil, bluegrass requires a rich soil.

Known and Unknown Factors in Greenkeeping*

By K. F. Kellerman

Other papers on the program of this meeting offer experimental evidence of progress in the science of fine turf growing. The detailed study of different species of grass, of fertilizers and soils, and of pests and diseases affecting grass are rapidly substituting for the mysteries of turf management a knowledge of the essential factors. It would be a short-sighted policy, however, to close our eyes to important experiments and discoveries seemingly entirely apart from experimentation upon the problems of golf courses. Many of the discoveries of the last few years contain suggestions that may advance our experimental work.

Of course, no one yet understands much about soils, but some things at least are better understood than they were a few years ago. For example, a fertile soil is not a dead mass of nondescript material. All fertile soils are full of living things; literally millions in each cubic inch, and of these many millions there are hundreds of different kinds of bacteria, molds, microscopic worms and other animals. If we kill all of these living organisms in the surface foot of soil by heat or poison, neither grass nor other plants can grow properly in this dead soil. Usually a sterilized soil can be restored to fertility by mixing with it either a little fresh "live" soil or manure. The value of the manure undoubtedly is due in such a case to the enormous number of bacteria and fungi it brings to the dead soil, but whether the bacteria in manure are equally beneficial when put onto a good "live" soil we do not yet know. We do know, however, that manure has a value in increasing the growth of most plants, including grass, that is remarkably in excess of the plant food percentages determined by fertilizer analysis. It seems reasonable to ascribe this benefit, at least partially, to the decaying and nitrifying bacteria and fungi in manure.

Recent studies of plant food minerals essential for plant growth suggest another partial explanation. It is now clear that plants as well as animals have very exacting requirements for minute quantities of certain minerals, in addition to the three so-called fertilizer elements for growing plants. Traces of manganese, magnesium, calcium, iron, sulfur, and iodine are absolutely necessary for normal growth of many, if not indeed all, plants, but the amounts needed vary with different plants. The unusual value of manure may thus be due partly to traces of these essential chemicals, and if we learn the food needs of our turf grasses more thoroughly we may be able to mix fertilizers even more satisfactory than any now made for grasses. Not only these mineral foods, but the acidity of a soil, determine what plants thrive best in it. Some plants can grow only in an acid soil, some only in a neutral one, or one high in lime, while others, such as the bent grasses, can grow in all of these conditions. Most of the weeds troubling golf courses, however, are at their best in the lime soils. The extent to which the lime-loving weeds can be discouraged by the use of acid fertilizers, such as ammonium sulfate, or by aluminum sulfate, is yet to be determined, but the results so far seem very promising. In adding these materials or, in fact, any other fertilizers or other salts to the soil, changes in the composition of the soil are brought about which are but imperfectly understood. Soils even of apparently similar texture and composition may

* An address given at the Annual Meeting of the Green Section, January 9, 1925.

differ widely in the extent to which different bases in the soil may be replaced by materials added, and these differences in the behavior of the mineral compounds of the soil almost certainly are reflected also in the biological conditions of the soil.

Clays especially are but little understood. Chemically, to be recognized as silicates of aluminum, they are capable of varied composition, including traces of calcium, iron, and other elements. Clay soils are generally said to be difficult to handle, and many reasons have been suggested. The puddling of clay when it is wet is well known, but whether walking over a wet course results in puddling the surface, except in very extreme cases, is doubtful. It is probable that heavy rolling of a wet course will compact a true clay seriously, and might even puddle almost bare areas. The essential thing, where it can be accomplished, is to incorporate sand, manure, or other vegetable matter in the clay so that it will flocculate or break up readily upon drying. If the soil regains a proper tilth upon drying it will not be injured by rolling. A soil surface which will not cake is a matter of importance in "taking" water when sprinkling grass, as well as in avoiding the hard surface of a fiery green.

Hard soils are due primarily to a lack of proper flocculation of the soil particles. In clays, the flocculation brought about by the incorporation of vegetable matter not only improves the flocculation of the clay but provides additional spongy or friable material, and therefore improves the yielding or springy character of the surface layer. The excellent springiness of natural soils composed largely of vegetable peats has suggested the use of peat mixtures with clay to improve the physical texture of clay greens. These mixtures have not proved especially satisfactory, and from the above lines of reasoning it appears that the unsatisfactory character of these mixtures may be due to the lack of soluble mineral elements in the peat, and accordingly its comparative lack of effect upon the composition of the clay materials. Peat mixtures with clay are apt to be streaky, the clay not mixing at all readily with the peat. On the other hand, the mixture of manure or of green manures with clay soils, even in lesser quantities, does materially improve the degree of flocculation and thus makes possible both the better aeration and more satisfactory absorption of water.

That a hard and fiery green is hard on the grass is obvious. Whether the injury to the grass is largely starvation for lack of proper plant food and of a steady water supply, is not so certain. That aeration was inadequate has been suggested; that may have some effect, for some plant roots are very sensitive, while others can stand being either under water or sealed in soil almost indefinitely. Rice, for example, will germinate and grow under water, although most seeds can not either germinate or grow properly unless they have an adequate air supply. Grass seeds are quite sensitive to a lack of air supply; but it is not known how extensively this limitation applies to the vegetative stage of bent grasses.

The difference in the effectiveness of watering by sub-irrigation and by sprinkling has been ascribed to the better aeration likely to obtain in the case of sprinkling. Although sprinkling appears to be a more satisfactory method of watering for grass and some other plants, it is possible that this may be due to stimulating the aerial portions of the plants rather than by changes in the air supply of the roots. Among the possibilities that should be investigated are the stimulating effects of carbon dioxid, which might be incorporated in the sprinkling water.

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

A player tees the ball for a drive, swings, and misses it entirely. He then addresses the ball, playing two, and accidently knocks it off the tee. Has he the right to re-tee without penalty?

(Decision.) As the player had made his first stroke when he missed the ball, it was in play, and therefore there is a penalty of one stroke for knocking it off the tee when he subsequently addressed the ball. Rule 12.

Both players have reached the green. One player putts his opponent's ball toward the cup and his opponent then putts the other ball left on the green, which he thought was his, and after making the putt discovers that both players played each other's ball. This was in match play.

(Decision.) Rule 20 covers this point. The hole stands as played out.

A player driving off of the tee drives a ball straight down the fairway and gets an unlucky hop to the left into a ditch under a bridge. This bridge is just laid across the ditch and can be moved very easily. Is the player allowed to move the bridge so that he can make his shot? This ditch is dry about nine months out of the year. The way the ball was lying, it was impossible for him to make the shot without moving the bridge. An opponent objected to his moving the bridge, upon which he took the attitude that if he could not move the bridge he could drop the ball a club's length from the bridge in the ditch without penalty.

(Decision.) The player should not have moved the bridge, as it was part of the water hazard. Unless there were a local rule covering, the player had no right to drop a club's length from the bridge.

Competition in Golf Architecture

It has long been the practice in the construction of buildings to invite the submission of plans and estimates of cost by different architects—the builder reserving the right to select the one he deems most satisfactory. Is this idea applicable to golf architecture? Certainly any golf club in building its course desires the best possible layout and the highest type of holes, both as to playing quality and to landscape beauty. Such a plan, if golf architects can be induced to compete, should make for more rapid progress in their art. Certainly it would go far to discourage the tiresome repetition on one course after another of identical holes.

It is true that every painter, every sculptor, perhaps every artist, has idiosyncrasies, so that an expert can almost at once recognize the creator of a piece of art. This is notoriously true of golf architects. For them it would seem there is far less excuse than in the case of painters, builders, or other artists. The golf architect has Nature as his setting, and no two pieces of terrain are quite identical. In other words, Nature never repeats. To make more or less exact replicas of holes whether meritorious ones or otherwise—regardless of the topography and landscape—is not a high type of art.

It certainly would be both interesting and instructive to compare the plans of several different architects for the same piece of land. It would necessitate careful work of competent judges to determine the most meritorious.

Any club contemplating the building of a first-class course could very wisely offer a fee of, say, $10,000 for the most meritorious plans—a sum which some architects are already asking. If the club furnished an accurate topographical map of the land, the fee might be considerably reduced.

At the present time the selection of a golf architect is more or less an emotional matter. Some one urges that John Smith is best, because he has built many courses; others lean to James Jones, because he is a convincing talker; while some would get George Robinson, because he has a wonderful set of models. Personal likes and dislikes enter the equation also. Few if any of the men who select the architect have the necessary temperament and technical knowledge to decide on an architect in an unbiased way based on the actual merit of his work.

It is hoped that some of the new clubs will adopt this suggestion of inviting competitive plans and estimates.

Strange Archaeological Discovery

(From The Scientific World, January, 9316.)

In an excavation being made for the new sunken garden at Frogaria, not far from Niock, which the ancients, at the time this rock was formed, called *New York,* a layer of shale-like rock of recent geological formation was encountered, evidently an old lake bottom. This layer of rock contained a stratum of globose objects about as large as a hen's egg, but perfectly spherical. These objects were stratified, as many as twenty layers in some places, elsewhere fewer. The surface markings show a curious series of symmetrical designs, some of them tessellated, others dimpled, some muricate with little excrescences. Over one hundred different designs have already been found, and but a small portion of the rock has been broken so that the objects can be released.

At the meeting of the National Academy of Science last evening there was tremendous interest shown. The more conservative members refrained from making comments, but among the younger men were enthusiastic advocates of at least four different theories. Dr. Bougee argues that the objects were seeds of some unknown group of plants. Prof. O. Y. Dumbkopf ridiculed Bougee's idea and insisted that the peculiar fossils were the eggs of some large lizard. Other guesses were by Dr. Razz, who thought they must be puff-balls, and by Dr. Koth, who opined they were coprolities.

Cross sections of the objects have not as yet been accomplished, but Director Glum, of the Biological Laboratory, called attention to the fact that many of the objects were scarred, some indeed with deep gashes, which disclosed that the outer layer is different from the interior. He estimates that the area of rock containing the objects is about 100 yards long and 200 feet wide. In this rock are embedded at least 13,650,000 of the curious spheres.

The meeting adjourned without shedding much light on the mysterious things, but interest among the savants is intense. It is hoped that with very hard steel saws it will be possible to section the objects, whatever they may be, and thus perhaps solve the mystery. A very mystifying feature of these strange objects, utterly new to science, is that they should occur in such immense numbers in the spot where found.

Recent Books on Turf

LAWN MAKING. By Leonard Barron. 1923. Doubleday, Page & Co., Garden City, New York.

LAWNS FOR SPORTS. By Reginald Beale. 1924. Simpkin, Marshall, Hamilton, Kent & Co., E. C. 4, London, England.

GRASS. By A. J. Macself. 1924. Cecil Palmer, 49 Chandos St., Covent Garden, W. C. 2, London, England.

Most of the old literature (both English and American) dealing with the growing turf is "desk stuff"—that is, written by fellows with more or less botanical knowledge but who manifestly had never carried out any actual turf experiments. The older American writers copied to a great extent that which the British fellows had written—poetry and error included. It is distressing to see that the recently published books continue to repeat statements long since proven erroneous, evidently from a slavish bowing to so-called "authority." Here one still finds the old and erroneous information and advice. Thus the English writers say: use lime to sweeten the soil; use the spike roller to cure hide-bound turf; seed mixtures are better than one kind of seed; charcoal purifies the soil. The American writers say: we can not hope to duplicate English turf in America [if we could it would not be worth while]; threat your grasses to get deep root growth; sow grass seed in spring; use wood-meadow grass for shady lawns; crested dog's-tail is recommended; etc.

If you want your library to be complete, get these books of course, but be extremely cautious in following the advice they give where it runs counter to that of the Green Section.

Winter-killing in the Chicago district.—Mr. Leonard Macomber, Active Chairman of the Green Section, Chicago District Golf Association, writes as follows under date of April 25: "I might mention that most of the courses in this district are in pretty bad shape owing to winter-killing. We had a pretty bad ice storm in December and the *Poa trivialis* and of course the *Poa annua* patches have been entirely killed out, many of the greens being very badly spotted. This is especially noticeable at Exmoor, Flossmoor, Indian Hill, Evanston, and in fact at practically all of the older courses where *Poa* species are found in the greens. All of the patches of bent came through in good shape; all of the new greens planted with stolons are perfect."

It would be of interest to receive reports from other clubs with regard to the effects of last winter's ice storms on the various turf grasses.

A weed that makes good turf in the South.—On many southern golf courses there occurs on the putting greens a weed with leaves divided in fern-like fashion that makes excellent turf through the winter. In some places the plant is called fern-weed, certainly a much more attractive name than wart-cress or swine-cress which it is called in Europe. Technically it is named *Senebiera coronopus*. The plant is one of the mustard family and has globose pods covered with warty elevations. It is native to southern Europe and has long been introduced in America. In the South the seeds sprout in fall and the plants grow all winter. On putting greens especially it makes dense turf of very satisfactory quality. Perhaps it may prove to be an ideal plant for winter turf on southern putting greens.

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. "Sour soil" and "acid soil."—In a circular from a fertilizer dealer is this statement: "When nitrogen is absorbed by plant life the other elements—hydrogen, oxygen, and sulfur—combine with lime in the earth to form calcium sulfate. This is a neutral product that has practically no effect either on the soil or plant life. Sour soil will not permit this chemical reaction and therefore will not respond to the application of ammonium sulfate. Land lime should be applied to sour soil, after which sulfate may be used to good advantage." My understanding is that sour soil is soil that shows an acid condition, and from the BULLETIN I learn that acid soil is the most favorable for the growing of grasses, and that certainly lime should not be added. I would be glad to have an explanation of these apparently conflicting ideas. (Wisconsin.)

ANSWER.—There are a good many misstatements in the paragraph you quote but there is only one which needs any clarification in the point you bring up. In the first place let us state that the term "sour soil" is used in two distinct senses: (1) that now generally used by soil scientists, which makes the term identical with soil acidity, and (2) that probably more commonly used descriptive of the condition of poorly drained soil. "Acid soil" is desirable for many plants, including many grasses. In fact, there are many plants which will grow only in "acid" soil and will disappear if lime or any other alkali is added. Furthermore, there are plenty of plants which will grow in soggy or "sour" soil, although such soil is decidedly bad for bent grass, as well as for most grasses and plants. To attempt to make a general statement to apply to all kinds of plants, as apparently is the attempt in the paragraph you quote, is entirely misleading. Neither ammonium sulfate nor any other fertilizer can be used to advantage on a waterlogged soil in connection with the growing of any of the common turf grasses, and the only remedy is improved drainage.

2. Controlling pearlwort.—We are sending you a speciman of moss which has come into our putting greens wherever we have sown Colonial bent seed. The seedsmen from whom we purchased the bent seed claim that it was impossible for the moss to be introduced to our greens through the medium of the seed, as moss is not propagated by seeds but by spores. Nothwithstanding this, the evidence seems to be clear to us that the moss was introduced into our greens through the medium of the seed. We should like to have your opinion in the matter, and also recommendations for getting rid of the moss. These mossy places will grow to the size of a golf hole in a couple of weeks. We must admit that a putting green of

nothing but this moss would be pretty good, but mixed with the bent it spoils the looks. (Massachusetts.)

ANSWER.—The speciman you send is not moss, but pearlwort, about which many notes have appeared in the BULLETIN from time to time. This plant is abundant along the Atlantic coast and the Pacific coast, and it was possibly established at various places around your golf course before the course was built. It prefers moist, sandy soil near the seashore, yet grows well enough inland. It might be well for you to make a careful examination of the land about your greens to see if the plant is growing anywhere in abundance, as if that is the case the seed would at once be transferred to your greens. If you find the plant in the rough or outside the limits of the course, it can easily be destroyed by the use of weed poisons, particularly sodium arsenite, as described in the article on page 169 of the July, 1924, BULLETIN. If you do not fight the plant from the start you can make up your mind that it is going to be with you permanently. In our judgment, this is the worst weed you can get into your putting greens. To remove it from your putting greens it should be cut out and destroyed, and replaced with pieces of sod. It is a good idea to have the keenest-eyed man you have go over the course and sprinkle a little ammonium sulfate on every patch of pearlwort he finds. This will burn the foliage of the plant so that the man who follows him can readily find the patches of pearlwort and cut them out.

3. Cutting seedling fairway turf.—We are seeding new fairways this spring on an addition of 9 holes to our course, which however will not be opened for play until next year. We should like your advice as to the wisdom of letting the grass grow during the coming season, permitting it to go to seed and thus produce a heavier turf by next year. The fairways are being seeded to Kentucky bluegrass and redtop. (Iowa.)

ANSWER.—We would advise you to begin mowing your grass after it becomes 1½ or not to exceed 2 inches high, and to keep on mowing it. Do not let it grow tall. Your turf will thicken only under frequent mowing, and will become thin if you attempt to allow the grass to go to seed.

4. Response of bluegrass and redtop to ammonium sulfate.—In your article on page 50 of the BULLETIN, Vol. V, No. 3, March, 1925, an account is given of the excellent results obtained from the use of ammonium sulfate and ammonium phosphate on bent grass. Our greens are of bluegrass and redtop. Have any experiments been conducted to determine the effect of these acid-reacting fertilizers on bluegrass and redtop? (North Dakota.)

ANSWER.—We have found ammonium sulfate very beneficial to bluegrass and redtop. We have not tried ammonium phosphate on these two grasses but are of the opinion that it would be equally beneficial.

5. Utilization of stable manure; its effect in producing grubs.—We have an abundance of stable manure, but very little of it has been placed on the fairways. I believe that this has been wrong, and that this manure should have been generously used on our fairways. We now have our manure spreader working every suitable day, and shall continue this program to the extent that play will permit. Please correct us if we are wrong in this. In certain places grubs are giving us trouble on our fairways, and we are afraid they will extend their activities to the greens. Do you think the use of a disking machine would be practicable in destroying the grubs in

these infested places? We should of course follow the disking with a roller. (Kansas.)

ANSWER.—We would advise you to use your manure rather sparingly as regards spreading it on the fairways. It is all right to scatter it over the fairways in the winter, and to use some of it in your compost piles; but do not use it in excess just because you have it. The use of too much manure will increase your grub troubles greatly. The grubs you have however are those which appear only periodically, and the chances are you will not see them during the coming season. There are methods of destroying them, but the process is expensive, and we doubt if it would be worth while going to the expense if it is your fairways only which are infested.

6. Removing crab grass and checking its introduction.—Crab grass is giving us considerable trouble in our greens. What treatment do you recommend? (Ontario.)

ANSWER.—Unfortunately we know of no very easy method of ridding greens of crab grass. Much can be done toward checking its introduction into the turf of greens if the greens are constructed so that they are not overwashed by rains falling on the fairway or rough, as much crab grass seed is carried to greens, by heavy rains, from nearby infested turf. To remove crab grass successfully, the plants should be pulled out by hand before they get a chance to grow large, and indeed upon their first appearance. One man, woman, or child can pull more crab grass in a day at this stage than three can pull after the plants have reached the branching stage. The greens should first be watered fairly well, as the plants can be pulled out much more easily if the soil is not hard. Constant attention is necessary during the entire season also, as the seeds, which are constantly being carried to greens, germinate quickly, and the plants mature in a short time and produce abundant seed. A single plant allowed to go to seed will infest a large area.

7. General treatment in the upkeep of greens.—Our general practice is a heavy topdressing of the greens twice a year and the use of temporary greens at such times. Is it possible to get as good results with more frequent but lighter topdressings, say once a month, so that the greens are continually in play? (California.)

ANSWER.— The best general practice is the use of topdressings of compost whenever they seem desirable, and in addition now and then the application of ammonium sulfate. The frequency of these applications depends on the quality of the turf, and that should be your guide. There is no objection to topdressing lightly every month or every week. Ammonium sulfate, in light doses—2 to 3 pounds to 1,000 square feet—can likewise be used as frequently as desired. One must use his own judgment. After the turf is getting into the highest type of condition, the application of topdressing and fertilizer should be frequent enough to maintain the turf in such a condition.

8. Rough-stalked bluegrass in bent greens.—I am sending you a specimen of a grass which has invaded our bent greens and which is objectionable on account of its coarseness. What is the grass and how can we get rid of it? (New York.)

ANSWER.—Your specimen is rough-stalked bluegrass, or bird grass (*Poa trivialis*). The best thing to do with it is to cut it out if you want to get rid of it. Otherwise it will persist, especially if the greens are kept moist, as they should be. It thrives in shade; and if your greens in which it occurs are shaded you may find, however, that it will make a fairly good turf. We have had several reports from clubs recently that this grass is in their bent greens, and we are inclined to think that it got there as an impurity in German mixed bent seed.

9. Use of deep well, cold water on putting greens.—Our water is pumped from a deep well and is quite cold. Should steps be taken to modify the temperature of this water before sprinkling it on our greens? (Minnesota.)

ANSWER.—We believe it will do no harm to apply your water to your greens just as it comes from the well. Our opinion is based on observations, however, as we do not know of any experiments which have been conducted with this problem.

10. Effect of white clover on Kentucky bluegrass stands.—Our bluegrass, which formerly seemed to be growing fairly well and gave prospect of improving, can hardly be seen now in some spots for the white clover. Is there any danger of this bluegrass being entirely choked out by the white clover? Evidently our heavy growth of white clover is due largely to the excessively wet and cold spring. (Virginia.)

ANSWER.—We think you need have no fear of the Kentucky bluegrass being crowded out by the white clover. Sometimes the latter becomes very abundant and apparently crowds out Kentucky bluegrass, especially in small areas, but invariably recedes and is later replaced by the bluegrass.

11. Calcium cyanamid as a worm eradicator.—Calcium cyanamid is a powerful insecticide. Has it been tested out in killing earthworms? (Ohio.)

ANSWER.—Calcium cyanamid burns grass so badly that its use as a worm killer would be undesirable purely on that account. Furthermore very few of the cyanamid compounds will penetrate any distance in the soil.

12.—Planting creeping bent greens from clippings.—Can we use creeping bent clippings as successfully as we can stolons in planting a new green? How important is it to keep the surface soil always thoroughly wet during the early stages of growth? (Colorado.)

ANSWER.—Creeping bent clippings can be used as successfully as stolons from a creeping bent nursery in planting a new green provided the clippings contain nodes, or joints, and are not simply pieces of grass blades, as is likely to be the case with most clippings. This means that the grass must be fairly long when it is clipped, otherwise the clippings will consist merely of leaves. On the other hand, it is usually unwise to allow creeping bent greens to grow long enough to make it possible to cut clippings with nodes. Therefore, as a common practice we advise the growing of a nursery for vegetative material of creeping bent. It is important to keep the surface of a green moist during the early stages of growth of bent planted vegetatively. This does not mean that the soil should be soaked, but that it should be kept at least slightly moist, so that the stolons will not dry out before they root.

Meditations of a Peripatetic Golfer

Commercial humus has some virtue. Sawdust has more.

Topdressing with one-fourth inch of sand! A topdressing should never be over one-sixteenth inch; less is better.

Whenever any new thing of plausible merit comes along, better let it alone until the experimenters test it fully and report. Then use your own judgment.

Putting greens require constant skilful care. It is astonishing how fast they deteriorate with neglect.

Prime requisites for good greens of creeping bent:

1. Good drainage.
2. Ample use of water.
3. Topdressing with compost occasionally.
4. Sulfate of ammonia frequently.
5. Avoid any other treatment, especially lime.

White clover in the putting greens is something that should injure the pride of any good greenkeeper. It is a bad hall-mark.

Fescue greens. "Rotten," as usual. Topseeded to bent in late August. Perfect the following April. (This is the usual story, but it is always astonishing.)

Starving the grass on a putting green is the most futile of all methods.

Put suitable flowering plants that take care of themselves in the places not otherwise used. They will add to the charm of any golf course.