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

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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, 1924.

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, 456 Louisiana Avenue, 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, 456 Louisiana Avenue, 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.; Sec'y, C. S. Lee, Tuxedo Park, 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, 1924.

(Signed) BERNARD CONNOR.

My commission expires August 6, 1927.

DR. PIPER GOES ABROAD.—For the past two years the Green Section has looked forward to the time when Dr. Piper could go abroad to visit golf courses and study turf grasses in Great Britain and continental Europe. At last the time has come. Dr. Piper sailed on May 7. Those who have studied golf courses in England and Scotland and elsewhere in Europe have some appreciation of the value that Dr. Piper's trip and incidental studies will be to the Green Section and to golf clubs generally in this country. And not the least gratifying feature in the whole happy situation is that Dr. Walter S. Harban, who is touring Europe with his family, will meet him there and will doubtless be able to be with him much of the time. Europe will be welcome to anything she has left in the way of data on turf and golf courses when these veterans leave her shores. At least so thinks the Vice Chairman.

To Our Friends

If you love THE BULLETIN OF THE GREEN SECTION, chasten it with your criticism. The editors are ordinary human beings, who are infallible only part of the time. Doubtless we shall continue to err now and then so that we may still be human. Occasionally we meet one of our cooperators who tells us a lot of complimentary things and then refers to an article published in THE BULLETIN which he thinks is open to criticism. Often the point of view presented is well taken, and therefore distinctly helpful. Of course we meet only a small number of our readers, and so secure directly the admonitions of only a few.

We are not quite like the little girl who had three younger brothers and, when the next baby came, a boy also, distressfully told her mother, "I am getting so tired of boys." We appreciate the numerous complimentary messages we receive, truly, but if we could receive more in the way of helpful criticism we would be still more thankful.

Do not forget that the Green Section is primarily a cooperative enterprise and you are one of the partners. One of your implicit duties is to let us have your point of view, otherwise you are not really cooperating. We heartily concur with Bobbie Burn's sentiments:

"Oh would some power the giftie gie us
To see ourselves as others see us."

Top-Dressing Creeping Bent Putting Greens With Compost

By O. B. Fitts

The importance of top-dressing, to the maintenance of ideal putting greens, is in many cases underestimated to such an extent that numerous mistakes occur resulting in undesirable conditions of the turf. Some make the mistake of *not* top-dressing at all. Others make the mistake of top-dressing with seed when they should use compost, or sand alone, as may be needed. Still others top-dress in a haphazard way, with little idea of why they are doing it; some one suggested that the greens needed top-dressing, so they got busy and top-dressed them; what they used or how they used it was apparently of little importance, just so long as they top-dressed. Haphazard top-dressing is a mistake; it may by chance give the desired results; but why take the chance? It will more often be wrong, and the results will be bad. Then we find those who do the thing right; they employ the proper methods and get the desired results. The purpose of this article is briefly to discuss the proper methods of top-dressing, particularly the methods which have been found, during the course of experimenting at the Arlington Experimental Farm, to give the best results on a heavy clay soil under conditions existing there.

Materials to Use.—Owing to the fact that the composition of the soils of different greens varies, it is necessary that the composition of the materials used for top-dressing should vary accordingly. The proportions of the ingredients to be used should be governed by the composition of the soil of the green. The three principal materials generally used in compost are loam or clay loam, manure or similar organic matter, and sand. On clay soil, sand should be included very liberally. On sandy soil, loam or clay loam should preponderate. If the soil is poor and contains little organic matter, manure should be used freely. On medium loam soil, a mixture of equal parts of manure, loam, and sand should be used. For spring or fall application, the top-dressing material (compost) should be mixed thoroughly with enough ammonium sulfate so that an application of the latter may be made at the rate of 3 pounds to 1,000 square feet, and during hot weather at the rate of 1 to 1½ pounds to 1,000 square feet.

Rate of Application.—Experience has indicated that light and frequent applications of compost give best results. One to 1½ cubic yards to the green is ample; that is, at the rate of 1 cubic yard to 5,000 square feet of surface. When applied at this rate, spread uniformly over the surface, and then well brushed in, it will not interfere with play, whereas heavier applications make the surface undesirable for putting for several days. The light application does not cover the grass or temporarily check its growth. Compost should be worked down around the base of the grass plants, leaving the growing shoots exposed and thereby encouraging the growth of the grass and not retarding it. Heavy applications cover the leaves in spots, causing a mottled, displeasing appearance both in the variation of growth and in the color of the grass. It is difficult to determine by any measurable depth of covering, just what quantity is best. In fact, the quantity which gives best results as above suggested is hardly of a measurable depth when spread uniformly over the surface, as it should be spread. One-fourth to ½-inch has been recommended at times as an advisable covering; but in experiments at Arlington and elsewhere it has been observed that even ⅛-inch or thereabouts has not given as satisfactory results as 1 cubic yard to 5,000 square feet of surface.

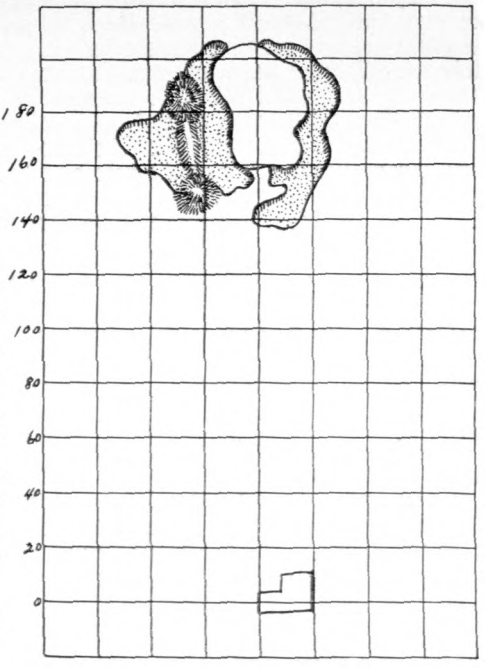
FREQUENCY OF APPLICATION.—An application of compost as here suggested is sufficient to keep the surface of the green in good condition for from three to six weks, according to the amount of play given it. It will also furnish the necessary plant food for the grass. For best results, compost should be applied at intervals of 30 to 40 days throughout the growing season. Also an application may be made advantageously during the winter when desired, as was demonstrated at Arlington last winter on several plats. The winter dressing should be applied late in January or in February for best results; this will bring the grass out in fine condition early in the spring. A disadvantage resulting from long periods between times of top-dressing, is that the surface of the green becomes packed and hard owing to the constant trampling, which makes it not only difficult for the water to penetrate but also makes it too hard for a good putting surface. Greens are frequently found in this condition, and various methods, such as spiking, reseeding, and others are used to overcome the trouble, but without success.

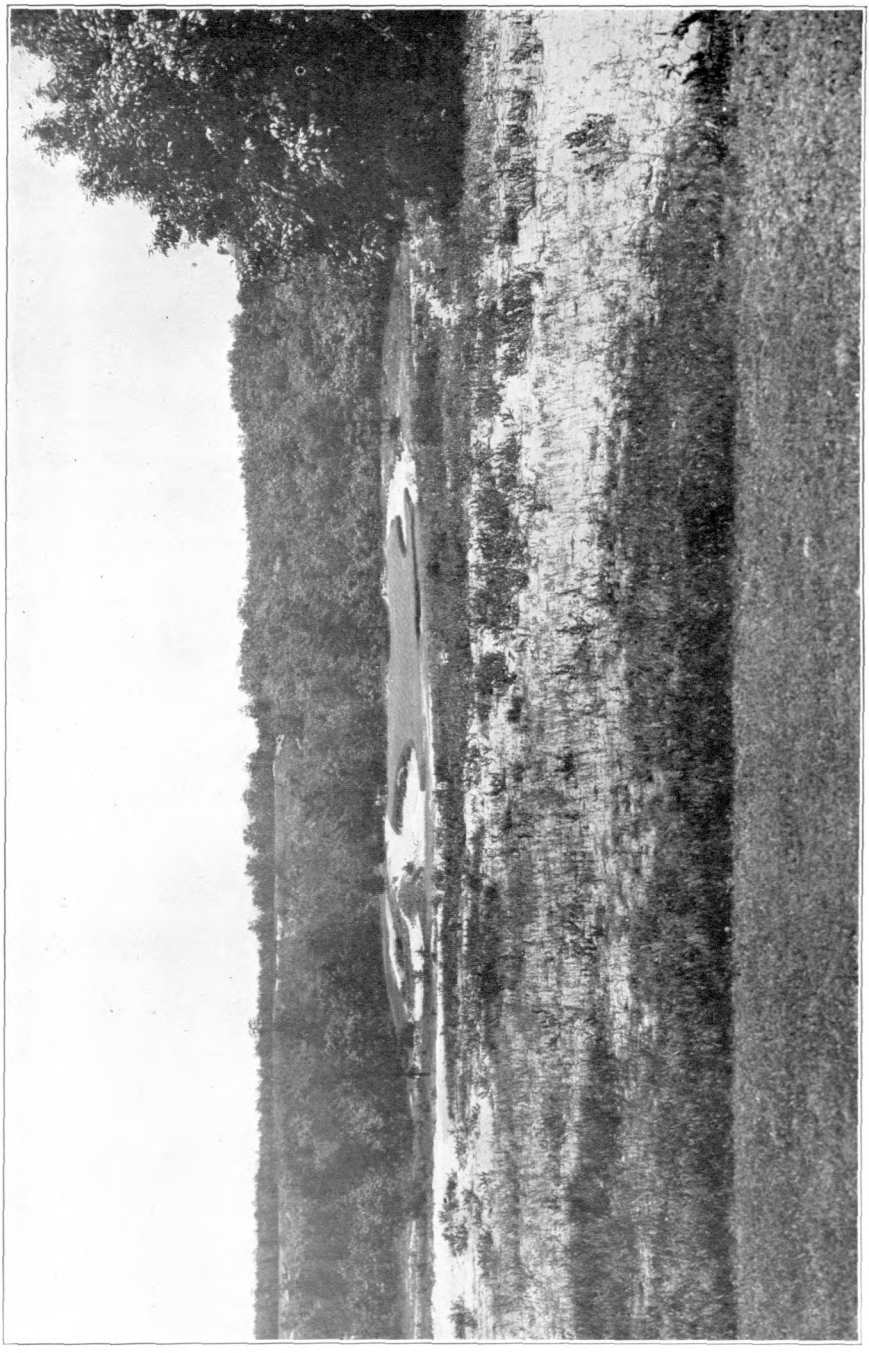
Top-dressing with good compost prolongs the life of turf and assists in maintaining a perfect putting surface. Greens can not be maintained properly without it.

Instructive Golf Holes VIII

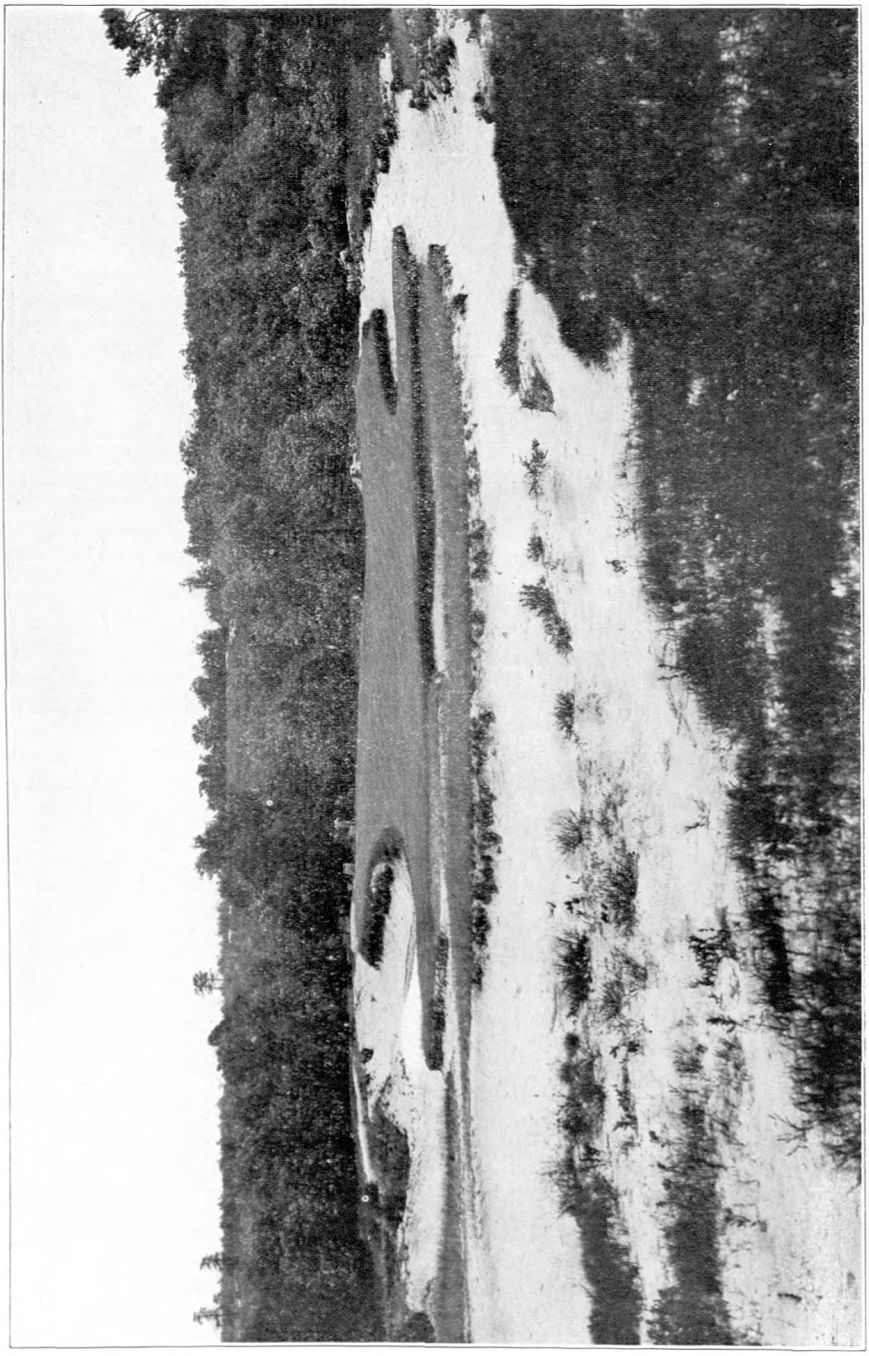
No. 3, Pine Valley Golf Club, Clementon, New Jersey

An extremely impressive hole 184 yards in length, the tee being about 30 feet higher than the green, the way being an easy down-grade. The approach and putting sward together are nearly an island surrounded by fearsome-looking bunkers. The whole way from the tee to the island of turf is rough composed of a stiff-leafed sedge and scattered blueberry bushes. It requires an accurate shot to reach and hold the green; otherwise the second shot is probably from a bunker. The surroundings are very beautiful, as the illustrations show, and the golfer who makes the hole in par 3 may well feel elated. The putting sward measures 8,500 square feet.





Hole No. 3, Pine Valley Golf Club. View from Tee.



Hole N. 3, Pine Valley Golf Club. Close-up View of Putting Green.

Earthworms

By R. A. Oakley

Whether or not earthworms may be regarded as a beneficial factor in soil making, is beside the point. They are a nuisance on putting greens, and should be removed. The question then is, How can this best be done?

Without going into great detail, there are two outstanding efficacious treatments. One involves the use of corrosive sublimate (mercuric chlorid), the other mowrah meal, a meal made from the seed of *Bassia latifolia*, the butter-tree of India, after the oil has been pressed out. The proprietary earthworm eradicators on the market nearly all contain corrosive sublimate or mowrah meal as their active agent. There are other substances that are used for the eradication of earthworms; these will be discussed or mentioned briefly later.

From the standpoint of economy and efficiency, corrosive sublimate is without question the best substance to use to rid turf of earthworms. Furthermore, it is exceedingly efficient if properly used. But here lies the difficulty. It is quite apparent that, notwithstanding all that has been written and said with regard to the use of corrosive sublimate as an earthworm eradicator, there are many who have injured their turf by applying it improperly. Corrosive sublimate may be applied either in a water solution or mixed with sand or similar inert matter. The liquid form is regarded by many as preferable. No attempt will be made here to prescribe the most economical methods of application but some fundamental suggestions will be given so that greenkeepers and others may use them as a basis upon which to develop methods best suited to their local conditions.

Two or not to exceed 3 ounces of corrosive sublimate dissolved in 50 gallons of water are sufficient for 1,000 square feet of green. After the solution is applied it should be followed with at least twice the quantity of water to wash it thoroughly into the soil. If it is desired to apply the corrosive sublimate dry, it should be mixed at the rate of 2 or 3 ounces to 2 cubic feet of dry sand, and the mixture scattered evenly over 1,000 square feet of green. Liberal watering should follow. When corrosive sublimate is applied in the way and at the rates suggested, especially if water is used freely afterward, no injury to the turf should result. In very hot, dry times, applications as suggested may cause a very slight burning of the turf; and furthermore, it is rarely that earthworms are in action at such times. The effect of burning from the suggested rates, however, will not be lasting or serious. Sometimes ammonium chlorid or ammonium sulfate is added to the corrosive sublimate. These salts have a tendency to make the latter more soluble and to decrease its burning effect on the grass. Neither apparently increases its efficacy as an earthworm eradicator.

A number of proprietary earthworm eradicators that are sold in liquid form and which contain corrosive sublimate as the active agent, have been analyzed by the Green Section. The following are the analyses of some which the Green Section has examined:

Laboratory No. 37633.—82½ per cent corrosive sublimate; 17½ per cent ammonium chlorid.

Laboratory No. 001614.—8½ per cent corrosive sublimate; 8½ per cent ammonium chlorid; 83 per cent water.

Laboratory No. 001652.—8½ per cent corrosive sublimate; 51 per cent ammonium sulfate; 6½ per cent potassium nitrate (saltpeter); 28 per cent sodium nitrate; 6 per cent water.

Mowrah meal is a very effective earthworm eradicator provided it has not lost its original active properties by improper storage or has not been adulterated. Furthermore, it possesses some fertilizer value, although not much when applied at the rate recommended for earthworm eradication. Good unadulterated mowrah meal, in relatively recent tests at Arlington, has been effective when applied at the rate of 15 pounds to 1,000 square feet of green, if watered liberally immediately afterward. Burning of the grass may occur with heavy applications of mowrah meal, but not the slightest trace of burning has been noted from the above rate. Mowrah meal deteriorates with age, especially if stored in a damp place. It is also subject to adulteration with sand or similar inert matter. These facts should be borne in mind by the purchaser.

Other substances the effect of which has been noted on earthworms are as follows:

Bordeaux mixture when used as suggested for the treatment of brown-patch seems to be poisonous to earthworms. Putting greens dusted or sprayed frequently with the mixture are rarely much troubled with them.

Sodium cyanide applied in solution seems to poison the earthworms in the soil, but it does not bring them to the surface. Only weak solutions of this chemical may be used with safety on turf, and such solutions are not sufficiently efficacious to be recommended.

Lime-water is only partly effective, and is not recommended.

Household ammonia, or ammonium hydroxid, if sufficiently diluted to prevent burning the grass, brings earthworms to the surface, but it is not regarded as very efficacious.

Vinegar, or acetic acid, in solution gives only fair results, not sufficiently good to be regarded as worth while.

Ammonium sulfate applied as a fertilizer to putting greens will greatly reduce the prevalence of earthworms. It is said that its continued use will discourage them almost completely.

It is relatively easy to tell when earthworms are active, by the appearance of their casts on the turf. It is then that treatment should be given.

Until something better has developed, it is urged that corrosive sublimate or mowrah meal be used as here suggested. The careful and systematic use of either will give highly satisfactory results and will have a tendency permanently to lessen the earthworm problem.

Corrosive sublimate is a violent poison and due care must be exercised in its use. All packages of the poison should be conspicuously labeled. If the sand-poison mixture is made up for future use, this should be labeled also. Corrosive sublimate corrodes metals rapidly and therefore it or its solution or sand mixture should not be put into metal containers. Perhaps these warnings are unnecessary, as corrosive sublimate has long been used as a worm killer; but it is well always to remember that it is a terrible poison.

No person having any direct or indirect financial interest in the sale of any article, material, or service used in the maintenance and upkeep of golf courses shall be eligible to membership on the Green Committee of the United States Golf Association.

Construction and Care of Bermuda Greens in the South

By P. D. Maxwell, Dornick Hills Country Club, Ardmore, Oklahoma

At the time our golf course was established, in 1914, there were no grass greens in the State of Oklahoma and very few in the South. At the present time probably 90 per cent of the courses in the South are still tolerating sand greens, and it is with the hope that I may be of service in inducing some of these to substitute grass greens that I offer the benefit of my experience covering the last ten years, during which time I have visited practically every grass green course in the South. Up to the last two or three years the matter of the proper selection of Bermuda was never suggested, and it is just now beginning to receive the proper consideration. Even now the average greenkeeper wants to tell you how he plants, how he cultivates, how he top-dresses, how he mows, etc., but always overlooks what to my mind is the all-important thing—the selection of the proper strain of Bermuda grass, which should be a fine-leafed strain rather than coarse-leafed. The strains of Bermuda are as diverse as the varieties of corn, and as different in appearance as are white and red corn. The differences between the average strain of Bermuda and the best Atlanta strain are as marked as the differences between bluegrass and the finest creeping bent grass. I have already touched upon the superiority of the Atlanta strain of Bermuda grass, in my article in the March, 1924, number of THE BULLETIN.

Only four of the forty golf courses in Oklahoma have Bermuda grass greens, and I believe this is about the proportion existing throughout the South. The greater proportion of the clubs still having sand greens are in ignorance of the fact that anything else is possible. A small percentage know they can have grass but think the cost of establishing and maintaining grass greens is prohibitive. For both classes the following suggestions may be of interest.

Bermuda will grow and do well in any state where cotton grows and will succeed fairly well in any soil, better in sandy soil with clay subsoil. At the time of planting a green, if it is possible to do so, mix 10 to 15 loads of stable manure with the top soil. This is desirable, but not absolutely necessary, as fertilizer can be applied at any time later. Drainage of the green is important, but all expensive subirrigation systems are to be avoided; I have yet to see one which is satisfactory. A water system is highly desirable, but not essential. I know of several greens which are kept in fairly satisfactory condition without artificial watering. Top-dressing gives very good results in the absence of a water system.

Bermuda can be planted in any month from March to July, but I would advise spring planting especially where there is no water system. Of the three methods of planting—seeding, sodding, and the vegetative method—the last named, which consists of planting the roots or stolons, is decidedly the best. Seeding is always more or less uncertain, and beside, seed contains a mixture of strains. Sodding is expensive and not as satisfactory as the vegetative method. Plant the roots or stolons from one to two feet apart. With proper attention and constant weeding during the first few weeks, one can get a perfect stand and cover for the greens in 80 to 100 days, and even in a shorter time if the planting is done in June or July, when the weather is very warm, if water is available to force growth. Bermuda thrives on heat. If expense is not to be considered,

the stolons may be planted very much thicker than two feet apart, and the results will justify the expense.

Most important is the weeding of the green during the first few weeks, thus giving the Bermuda full opportunity to spread and cover the ground. When the grass has completely covered the ground, top-dress with good soil. This will be food for the growing grass and will also help to obtain the proper surface for the green. It is then time to cut with an ordinary lawn-mower. After a few days of constant cutting, another and lighter top-dressing of sifted soil is necessary. When the grass begins to come through, begin the use of the regular putting green mower. I advise daily cutting, especially through the spring and early summer.

A period of 100 days will ordinarily elapse from the time the stolons are planted to the time the green is ready for putting.

After a stand is once obtained there is little trouble from weeds and other grasses, as, at least in Oklahoma, Bermuda brooks no competition.

Although, as I have stated, Bermuda will do fairly well in any soil, constant vigilance and intelligent attention are necessary in order to maintain a good turf of steady and luxuriant growth. We can not maintain good turf with fertilizing. For this reason I strongly advise using the mowers without grass catchers. By all means let the clippings remain on the turf. If greens are cut each day, as they should be, the clippings will never be noticeable and artificial fertilizers will be needed less often. When you feel that it is necessary to stimulate growth it can easily be done by top-dressing with good soil mixed with well-rotted stable manure. This is best done in early spring.

Bermuda turns gray with the first frost and remains dormant until spring. In order to produce turf during this period of dormancy, I sow from twenty to thirty pounds of Italian rye-grass seed on each green in September, and a very satisfactory winter green is thus obtained.

In closing, let me emphasize again the importance of the selection of the finer strains of Bermuda grass. This is the first essential in obtaining good Bermuda putting turf. This is a matter to which very few of the southern greenkeepers have paid attention, and I believe that the immediate future will show great advancement in this direction.

Preventing Crab Grass From Going to Seed

Paper Read by Robert Scott, Greenkeeper, Baltimore Country Club, at the Annual Meeting of the Green Section, January 5, 1924

Crab grass is a pestiferous annual weed. Its marvelous ability to produce seed is the great obstacle to be overcome in controlling it. If by any means its prolific seeding can be prevented or even held in check, one can be reasonably sure of better greens. Where crab grass is not too thick, the best method of getting rid of it is by hand-weeding as soon as the young plants are big enough to handle; but where it is so thick that this can not be done without tearing out the good grasses, other methods must be employed. The greens used to get so thick with crab grass at the Baltimore Country Club that they resembled a coco-fiber door-mat. Only a small area in the center of each green was weeded, and these areas were growing smaller each season as from all sides the crab grass kept advancing toward the center. The following method of combatting this

weed was used there successfully and may be useful to others who have similar conditions.

Twenty pounds of ammonium sulfate were dissolved in 50 gallons of water. This solution was strained through cheese-cloth into a spray pump. For large areas a power pump would be necessary. The crab grass was sprayed with this solution before it had begun to blossom. This early spraying is necessary, inasmuch as the end to be obtained is the prevention of seed production; moreover, at this early stage of its growth the grass has not become so vigorous as to smother the good grasses.

To obtain the best results, the sprayer should be equipped with a fine nozzle. The spraying must be done on a bright, sunny day. The crab grass should be sprayed two or three times, or until the leaves are as wet as when the dew is heavy. In places where the crab grass is very thick it is advisable to brush it with stiff stable brooms before spraying, in order to permit the solution to reach the underside of the leaves. In a few minutes after the spraying, the leaves of the crab grass, as well as of all other vegetation sprayed, will begin to turn dark and soft, and in a day or so will have a scorched, burnt appearance. In about a week, however, the crab grass and other grasses will be growing again. The spraying should then be repeated, and repeated a third time after a similar interval. Three sprayings will usually be sufficient in a latitude where frost can be expected by the middle of October; but where frosts are unusual at that time, the better practice is to use a stronger solution, killing all vegetation where used and then reseeding the area so treated, if the soil and foundation of the green are good. In either case, after the last spraying has taken effect, the treated area should be well raked both ways with iron rakes, cut as close as possible with a 6, 7, or 8-blade high-wheel mower with grass catcher attached, rolled with a spike-roller, seeded or stolons of creeping bent put on, and then covered with a top-dressing free from weed seeds. The crab grass which is not killed will be so retarded that it will not have time to grow and mature seed before frost arrives; and if the greens are composed of perennial grasses at least fifty per cent will come back from their rootstocks, making a much better stand than if allowed to be choked out by crab grass.

The greens thus treated at the Baltimore Country Club were never out of play, and, although unsightly during the treatment, were in much better playing condition than if the crab grass had been allowed to grow, produce seed, and die out naturally, leaving the greens rough and brown after the first frost and full of seeds of crab grass to produce further trouble. The year following, what little crab grass appeared on the greens so treated was removed by hand-weeding, and the greens have been kept clean since by the same method, the amount of crab grass decreasing each year. So it seems to prove that greens entirely smothered by crab grass can be treated by this method and then reseeded much more cheaply and effectively, and with greater satisfaction to the golfers, than by rebuilding or resodding.

RULINGS ON GROOVED AND SLOTTED CLUBS AND ON STEEL SHAFT CLUBS.—The following notice was issued by Cornelius S. Lee, Secretary, United States Golf Association, under date of April 15, 1924:

"The attention of the members of your club is respectfully called to the following rulings, made by the Executive Committee:

"*Grooved and Slotted Clubs.*—Club faces shall not bear any lines, dots, or other markings, made for the obvious purpose of putting a cut on the ball, nor shall they be stamped or cut with lines exceeding 1/16-inch in width, nor less than 3/32 inch apart, measured on their inside edges. Both line and dot markings may be used, either alone or in combination with the above limitations, provided all rough or raised edges are removed.

"*Steel Shaft Clubs.*—On and after April 12, 1924, the steel shaft club, as now manufactured, and in conformity with samples submitted to the Executive Committee of the United States Golf Association, may be used in all competitions held under the auspices of the United States Golf Association or subject to its rules and regulations.

"These rulings are now in effect and are applicable to all competitions held under and in accordance with the Rules of Golf of the United States Golf Association."

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

QUESTION.—A "tombstone tournament" was held at our club a few days ago. One of the members participating started at No. 1 tee, playing the first 4 holes in succession. Upon arrival at the 5th tee the member evidently thought that as long as there were so many players ahead it might be impossible to finish before darkness, believing they would have to wait so long at each tee. They then cut back to No. 1 tee again, as the first 4 holes were not at all crowded, playing these first 4 holes over again, then starting in at No. 5 and playing 5, 6, 7, 8, and 9 twice. When they finished the last 5 holes they had some strokes left and then started on No. 1. Is a player playing the course in this manner disqualified for not playing 18 consecutive holes? It would appear that if a 9-hole course had two starting points—namely, the 1st and 5th tees—a member participating in a tournament, if starting at No. 1, would have to play right through the full 9, or, if starting at No. 5, would be obligated to finish at No. 5. It does not seem right for a member to play any holes in the manner in which the member played in this instance, without disqualification.

Answer.—The player is disqualified for not playing the stipulated course, which is the 18 consecutive holes.

QUESTION.—In addressing the ball on grass in a ditch, may the club be grounded lightly, as in Rule 15?

Answer.—If the ball lies on grass in a ditch it is evidently within the confines of the hazard and is therefore part of the hazard and the club may not be grounded in any case. See Rule 25.

BENEFITS FROM CONTINUOUS MOWING.—We have found that continuous cutting does much toward improving fairway conditions, when one club can not afford to top-dress fairways with compost or loam of the proper kind. Constant cutting during the growing season helps the grass to tiller out and fine up and fill in the holes, which to a great extent eliminates cuppy lies. From our eight years' experience we are convinced that a poor golf club should spend its money for cutting equipment, which is cheaper than loaming fairways to improve them.—*W. R. Hurd, 2d., United Shoe Machinery Athletic Association, Beverly, Mass.*

An Appreciation of Prof. Carrier's Services

Announcement was made in the April number of THE BULLETIN with regard to the retirement of Prof. Lyman Carrier from active work as an advisory member of the Green Section. Perhaps no more fitting testimonial to the high value of his service to the Green Section can be presented to our readers than a resolution passed by the Executive Committee of the United States Golf Association at its meeting on April 11. The resolution is as follows:

"Ever since the Green Section started three years ago, Prof. Lyman Carrier, of the United States Department of Agriculture, has rendered it constant and valuable service. This work was all done during extra hours, in addition to his regular duties in the Department of Agriculture, and was done purely on the basis of a volunteer, without the expectation or receipt of any compensation except his knowledge that he was helping to improve the turf conditions of golf courses throughout the United States. Prof. Carrier has now determined to resign from the Department of Agriculture and enter into the commercial growing of bent stolons. This also necessitates his resigning from his position on the Green Section, as no member of the committee may be in any way commercially connected or have a financial interest in materials or supplies for golf or golf courses. Be is resolved, therefore, that the Executive Committee of the United States Golf Association hereby extend to Prof. Carrier their great regrets at the loss of his services in future and their very deep appreciation of the extremely valuable and unselfish work which he has done for the Green Section and for the golf courses of America during the past three years."

ERADICATING CHICKWEED WITH ACID-REACTING FERTILIZERS.—One of our New England correspondents, who has made a life-long study of fertilizers, writes as follows: "In 1896 I built a house, seeded my lawn, and (in the spring of 1897, I think) gave the lawn a dressing of wood ashes. Wherever the wood ashes was applied a little heavier than usual, mouse-ear chickweed appeared in considerable abundance. This was true practically all over the lawn. However, by the subsequent use of a fertilizer which was physiologically acid, it gradually disappeared, and I then had a very fine lawn in which the chickweed was no longer noticeable, if indeed present at all. I feel sure that if this soil had been kept even approximately neutral or alkaline, this chickweed would not have disappeared."

Eradication of Moss From Greens and Fairways

There are many kinds of mosses that grow on greens and fairways where the turf is thin and lacking in vigor. Little or no attempt has been made to study the peculiarities or the relations of the various species to their environment. Therefore all species are lumped under the general designation "moss." There has been a very widespread notion that the presence of moss of the kind or kinds that infest greens and fairways is little less than positive proof that the soil is acid or sour and that lime should be used to correct this condition. Writers for years have urged

farmers and others to lime soils upon which are found moss and certain other kinds of plants which are supposed to indicate acid soils.

Recently some experiments were conducted to determine the lime relations of the various common species of moss, to see just how quickly they may be eradicated by the use of lime. Much to the surprise of those who watched the experiments carefully, lime—that is, hydrated lime and also pulverized limestone—failed to check the growth of the moss; in fact, it seemed to encourage it.

In fertilizer tests that are now going into the third year at the Arlington Experimental Farm, Virginia, the plats that have received lime in very liberal applications are the plats most badly infested with moss. In fact, these plats and the check-plats are the only ones of the series in which moss is found. The grass on the plats is Rhode Island bent produced from seed, and it is clearly shown that the plats upon which lime has been applied are not only more badly infested with moss than are the check-plats, to which nothing has been applied, but that they are also more badly infested with other weedy plants and the turf is less vigorous than the untreated turf. For example, the plats that have been treated with ammonium sulfate and compost, are free from moss and practically free from other weeds. In other experiments where moss-infested areas have been treated with various fertilizers and lime, the lime has had no deleterious effect on the moss, while fertilizers such as ammonium sulfate, bone meal, soybean meal, and cottonseed meal have proved very efficacious in eradicating the moss.

In a word then, what is needed to improve mossy areas is not lime but some good grass fertilizer. The all-too-common notion that most soils are sour and need sweetening with lime before they will produce good turf should be relegated to the discard. Certainly, lime has no place in connection with the growing of bent or fescue turf; and it is now fairly well shown that what Kentucky bluegrass needs most to make it thrive is not lime but rich soil, which may be obtained by the proper use of manure or other fertilizers.

Care of the Greens Through the Summer

By F. G. Pickering, Greenkeeper, Myopia Hunt Club

It is very easy to keep a green in good condition. First, it should be swept and cut regularly with a sharp well-adjusted mower equipped with a grass-catcher. It should then be rolled with a light roller. The workmen cutting the greens should be instructed to take out, at all times, all major weeds, such as dandelions, daisies, plantains, chickweed, and pearlwort. This keeps the weeds in check and is a much better system than periodical weeding. The workmen should be instructed to report brown-patch and fairy-rings, so that these conditions can be properly treated. If your greens are in good condition, keep them so by applying a light dressing of good grass food as often as seems desirable during the playing season. Try to avoid cutting the greens when the grass is wet. Grass brushed and cut when wet does not stand up or give as true a putting surface. Remove worms during the muggy days in the spring and fall. There are many good worm-eradicators on the market. Corrosive sublimate is a perfectly reliable worm-killer. It does not injure the soil unless used excessively, and is much cheaper than any commercially ad-

vertised worm-killer. Its method of application is discussed on pages 26 and 92 of the 1923 volume of THE BULLETIN. For brown-patch and other fungous growths apply Bordeaux powder, 10 pounds to a green, once a week for two weeks. Greens should be dry when the application is made. There are several good machines on the market for use in making the application. The best way to treat fairy-rings is to remove the turf to a depth of 6 inches and replace it with good turf. The treatment for fairy-rings is also discussed on page 104 of the April, 1924, BULLETIN.

Fairy Rings at Minikahda

At the Minikahda Club, near Minneapolis, a mushroom growth commonly called "fairy rings" has caused trouble in the fairway for many years. This particular growth kills the turf where the mushrooms appear, in a circular or crescent band 2 or 5 inches broad varying from 3 to 10 feet in diameter. Where the turf is killed it is very slowly replaced, usually only after 2 or 3 years. The soil is filled with the fine, white threads of the fungus, thus making it nearly waterproof. Curiously enough, the fungus stimulates the grass just outside the ring and to a less degree that immediately inside. This stimulation has been attributed to the nitrogen formed by the fungus, and the killing of the grass in the band or ring proper to the formation of an excessive amount of the same substance. The fungus responsible is the well-known fairy-ring mushroom. This is a small mushroom with the caps 1 to 2 inches in diameter, pale brown above, the gills white, and the stems slightly hairy. When young they are edible and of excellent flavor; when old they become tough. The fairy-ring mushroom is widespread in Europe and America, and the rings it makes in lawns are well known.

A European method of destroying this fungus in lawns is to use iron-sulfate solution, 1 pound to 1½ gallons of water. Loosen the soil in the part where the mushrooms are growing and soak thoroughly with the solution. Apply again at half strength two weeks later. If the grass is killed by the fungus, replace with turf or scatter a little seed. The iron-sulfate treatment kills the threads of the fungus, but should not kill the grass.

NEW MEMBER CLUBS OF THE GREEN SECTION.—Dells Golf Course, Kilbourn, Wisc.; St. Clair Country Club, Tecumseh, Ontario; Miami Beach Golf Club, Miami Beach, Fla.; Masonic Country Club of Western Michigan, Grand Rapids, Mich.; Point Grey Golf and Country Club, Vancouver, British Columbia; Oneida Golf Club, Oneida, N. Y.; Whitin Machine Works Course, Whitinsville, Mass.; Butterfield Country Club, Hinsdale, Ill.; Niles-Buchanan Country Club, Buchanan, Mich.; Somerset Country Club, St. Paul, Minn.; Martindale Country Club, Auburn, Me.; Franklin Country Club, Franklin, Mass.; Sir William Johnson Country Club, Gloversville, N. Y.; Galveston Golf and Country Club, Galveston, Texas; Standard Club, Nashville, Tenn.; Bonnie Briar Country Club, Larchmont, N. Y.; Saucon Valley Country Club, Bethlehem, Pa.; California Country Club, Culver City, Calif.; South Hills Country Club, Pittsburgh, Pa.; Sharon Country Club, Sharon, Mass.; Alcoma Country Club, Wilkinsburg, Pa.; Elmwood Country Club, Warren Point, N. J.;

Ould Newbury Golf Club, Newburyport, Mass.; Nannahagan Golf Club, Pleasantville, N. Y.; Schenectady Boat Club, Schenectady, N. Y.; Blairmont Country Club, Hollidaysburg, Pa.; Royal Montreal Golf Club, Dixie, Quebec; Shelter Rock Country Club, Roslyn, N. Y.; Creek Club, Locust Valley, N. Y.; Community Country Club, Dayton, Ohio; Wolferts Roost Country Club, Auburn, N. Y.

Seeing Is Believing

"Be not the first by whom the new is tried nor yet the last to"—be convinced of that which you have seen with your own eyes, however new it may be. John Sanford holds this view, and John is not ashamed to confess it. Sanford has been in the employ of one of the world's largest field seed companies for more than 25 years. He functions as a sort of general factotum with specialties in gardening and grass growing. His knowledge of grasses gained from a quarter of a century of experience with them is rated high in the estimation of his employers. One day Mr. Jameson, the company's new sales manager, and incidentally an optimistic golfer, was privileged to see a creeping bent putting green made by the vegetative method. He became enthusiastic at once. The next morning at the office he saw Sanford and immediately recalled the new green. "John," he said, "I saw a putting green yesterday that was made by planting bent grass runners; not a seed was used. It is the finest green—." "Yes, sir," interrupted John, respectfully, but quite impatiently; "I have heard tell of such; but that's only one of those new fads folks are taking up. It ain't no good, sir. I tell you, if you want good turf you've got to sow good seed. Seeding's good enough for me." But the sales manager was not to be put off so easily. He obtained a day's leave for John and sent him to the Pleasant Valley Club to see the new bent green. When the old gardener returned he went directly to the sales manager. "Mr. Jameson," he said, "I have seen the grass. It is more than you said it was. When I set foot on it I just couldn't help it, sir; I lay right down on my face and stroked the turf with my cheeks. Mr. Jameson, for the first time in my life I believed in God."

Back Numbers of The Bulletin

These are available as follows:

Vol. I (1921). Reprint, in paper covers; price, $2.25.

Vol. II (1922). Following months are available, all other months exhausted: March, June, July, August, September, October, November, December; price, 35 cents per copy, index included.

Vol. III (1923). Bulletins for all months are available, except January and April; price, 35 cents per copy, index included. (Reserved for member clubs.)

Binders. Price, 50 cents per set.

A Rub of the Green

The title of this brief article was chosen with the clear intention to deceive, but it was not chosen in the spirit of facetiousness. It was selected in all well-meaning to attract, to cause the reader to stop, look, and read far enough to learn what it is all about. Surely, this is defensible. Now to the point.

Just as "a rub of the green" has lost many a match and broken many a beautiful friendship, so has rubbing the green injured much grass and ruined many a good putting surface. Wear and tear in the ordinary sense, while not always beneficial, are not particularly harmful; but rubbing or scrubbing or otherwise bruising the grass is decidedly harmful to it. Have you ever observed that the turf on the margins of many greens is poor or sometimes, in fact, entirely wanting? The abrupt turning of mowers and rollers is for the most part responsible for this. What should be fine approaches are frequently the poorest parts of the fairway, because the operators of the fairway mowers and rollers use them for turning grounds. A caddie at the flag, a player turning quickly on his heel, may unknowingly cause bruises that will show up ultimately as thin spots or as weeds. If you are the chairman of your club's green committee, or the greenkeeper, or are otherwise responsible for the care of greens, instruct the workmen to do the necessary work on the greens without rubbing the grass to the extent of bruising it. See that they turn the mowers and the rollers so that the turf will not be injured. See to it that the greens are not mowed when there is water on the leaves of the grass, unless cutting them in this condition is really necessary. Wet grass is very easily bruised and injured.

A mere suggestion is all that should be required to put on guard those who are held responsible. There are turf troubles enough without adding others that are relatively easily avoided, as are those that result from rubbing or bruising.

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. Getting Rid of Pearlwort and Chickweed.—We are sending two pieces of turf cut from one of our greens in which you will find weeds which are infesting them. Can you give us any information concerning these weeds and how to get rid of them? (Massachusetts.)

Answer.—The bright green weed with the thick narrow leaves is pearlwort. This is a bad weed and should be fought vigorously by cutting it out clean and replacing with good turf and then destroying the pieces cut out by burning or otherwise. If there is much of this in your greens you are up against a campaign of at least two years, as undoubtedly there are seeds of it scattered throughout all the greens; so even if you cut out every plant, you would still find that there would be a second crop later.

We would advise you also to look over your fairways for this weed, as seed of it is often carried to the greens from the fairways. If you find such patches in the fairways, destroy them with salt or other chemical weed-killers. You will find articles dealing with the treatment of pearlwort on page 69 of Volume I and page 269 of Volume II of THE BULLETIN. The other weed, with the roundish leaves, is mouse-eared chickweed. You will find this treated at the following places in THE BULLETIN: Volume I, pages 126 and 206; Volume II, pages 184 and 269; Volume III, pages 47 and 83.

2. TIME OF DAY AT WHICH TO WATER GREENS.—In the January BULLETIN you recommend the watering of greens in the morning instead of the evening. At what time of the day should the morning watering be stopped? I had always been of the opinion that it was dangerous to water greens in the morning. (New Jersey.)

Answer.—Water your greens whenever they need it, whether morning, noon, or any other time of day. We are unable to find any basis for the idea that watering in the middle of a hot day is injurious. It is certainly much more injurious to let the grass suffer if it needs water. As a matter of convenience, many golf courses water their greens at night. Water your greens when it is convenient. Our recommendation for morning watering, to which you refer, was based on the fact that our experiments indicated that watering in the early morning seemed to assist materially in the control of the brown-patch disease.

3. CONTROLLING CRAB GRASS.—Toward the latter part of summer the crab grass and weeds come into some of our greens and we have a big job weeding them by hand. Can you advise us how to keep the crab grass and weeds out? (Pennsylvania.)

Answer.—The only practicable means of controlling crab grass is hand-weeding. We would advise you to start weeding your crab grass just as soon as it is big enough to pluck and not wait for the plants to get large. In weeding crab grass from greens it is a good idea to soak the greens thoroughly a few hours before the weeding is done, as the roots will then pull out much more easily.

4. ANT EXTERMINATION ON PUTTING GREENS.—What is the best remedy for ants on putting greens and fairways? (New Jersey.)

Answer.—We know of no better method of exterminating ants on putting greens than the carbon disulfid method, which involves squirting about a teaspoonful of carbon disulfid into each nest. This can be done easily by means of a spring bottom oiler, or, as one of our correspondents writes, with a rubber bulb syringe having a rubber nozzle. He suggests that a rubber syringe is a very effective instrument for injecting carbon disulfid into each ant-nest. One of the clubs finds the method more effective if the nests are covered with wet burlap or some other cloth after the carbon disulfid is injected. The process is a tedious one, and unless the operator is careful he will damage the grass with the carbon disulfid. However, if the liquid is injected directly into the nests and does not come in contact with the grass it will do no damage. We are experimenting on methods of eradicating ants and hope soon to have a more satisfactory method than the one here mentioned. Poison baits have been tried with only a fair degree of success. Some of the poison baits contain borax, and this is very bad for the soil; therefore such baits should be used very sparingly.

5. MAKING AND USE OF COMPOST; USE OF SODIUM NITRATE, AMMONIUM SULFATE, AND LIME.—We have had no real compost materials to work with. Our present pile is ample but is less than two years old. When we made this pile the first of last year, we neglected putting in sand; black muck and manure with dirt were the materials used. We, of course, had plenty of lime in the mixture. Now we have on hand a supply of sodium nitrate and ammonium sulfate. Our greens need plant food. Their subsoil is sandy. Would you advise mixing the sodium nitrate into the compost while we turn the same over in our mixing machine, and then screen well and top-dress with it? Would you advise mixing our ammonium sulfate with sand and dirt and dressing the greens with that? Is it advisable to use both the sodium nitrate and ammonium sulfate at this time of the year (April)? If so, should they be applied in half portions only to prevent burning of the grass? I enclose a circular which cautions against the use of ammonium sulfate after May. Is this correct for us? I had in mind that the sodium nitrate would help the manure to decay faster; it is not two years old but must be used. (Indiana.)

Answer.—We would consider compost materials one year old suitable for top-dressing. The coarse material that screens out should go back into the compost pile for further decay. We believe it would pay to get some sharp sand, if possible, and mix about one-third sand with two-thirds of your screened compost when you apply it as a top-dressing to the greens. Sodium nitrate and ammonium sulfate are both quick-acting, nitrogenous fertilizers. There is nothing gained by mixing the two together. Either one, or both together, will burn grass if applied too heavily. An application of these at the rate of not more than 3 pounds per 1,000 square feet of green will not cause burning if evenly distributed. It would be all right to mix either the sodium nitrate or ammonium sulfate with screened compost and sand; furthermore, this would insure an even distribution. We follow that plan when we are putting on top-dressing. When applying either of these materials alone we generally mix them with about five times their weight of sand, and scatter the mixture over the grass. There is much more labor involved in dissolving these chemicals in water and applying the solution to the greens than there is in applying them dry. There is, however, no reason why they should not be applied in solution if one desires to do so. We get the greatest benefit from the use of these quick-acting fertilizers when applied early in the spring. We fertilize our grass, however, every month during the summer; but in midsummer it is safer to reduce the rate of application about one-half—that is, 1½ to 2 pounds per 1,000 square feet. There is greater danger of burning in hot weather than in early spring. Any minor burning is quickly overcome by the beneficial effects produced, so that even if the grass does turn yellow soon after the fertilizer is applied there is no danger of permanent injury. We prefer ammonium sulfate to sodium nitrate for the reason that the former discourages the growth of crab grass, white clover, and a number of weeds, while sodium nitrate does not. We have better turf from ammonium sulfate than from sodium nitrate. After applying either ammonium sulfate or sodium nitrate, water the greens thoroughly.

Let us give you one caution. Use lime very sparingly on your course. A little of it mixed in a compost pile hastens the decaying of manure, but further than that it is worse than useless on a fine turf.

6. FERTILIZERS FOR PUTTING GREENS; WOOD ASH AS A FERTILIZER.—I have long heard of the value of wood ash as a fertilizer, but as it is very

scarce here in Indiana I have had no experience with it. Can you give me some idea of its strength and action? Can it be used in a top-dressing with sand for a clay soil, and if so what proportion should be used? Is there any chemical reason why the ash and bone meal could not be used together with sand? How quickly should the grass respond to treatment in this manner? Is there a change in the texture of the clay after it absorbs the wood ash? (Indiana.)

Answer.—Ashes carry quite a high percentage of potash and some phosphoric acid. They are especially desirable for growing crops of clover. For that reason they should not be used on a golf course. We must get away from the fertilizer recommendations for farms if we are to get first-class turf. The growing of big forage crops and the growing of fine turf are two separate and distinct things. The best fertilizer which we have found for putting greens is ammonium sulfate, used at the rate of not more than 3 pounds per 1,000 square feet in the spring and fall and 1½ pounds in summer. In addition to this fertilizer the grass needs top-dressing with compost. While there are all sorts of ways of making compost, we prefer one consisting of one-third sand, one-third manure, and one-third clay loam. This, when screened, gives a top-dressing which does not run together and bake, and one which has a very beneficial effect on the grass.

7. Controlling White Grubs.—On the high ground of our seventh and eighth holes there are three or four acres of fairway heavily infested with grubs like the enclosed samples. Large patches of turf here and there throughout are entirely ruined and what is left is hardly worth preserving. Unfortunately, previous administrations have mistaken the results for supposed damage by crows. We are not sure of the nature of this grub but assume that the sodium cyanide treatment is what is required. These grubs are certainly very tough. We first soaked these samples in strong alcohol and afterwards in gasoline, but neither solution appeared to kill them. What method of treatment would you advise for controlling these grubs? (New York.)

Answer.—These insects are what are known as common white grubs. In recent work with the Japanese beetle, which works very much like the other white grubs, the best remedy has been found to be an emulsion of carbon disulfid. There is an article on this subject in the October (1923) issue of The Bulletin. We think you had better try both the sodium cyanide treatment described on pages 176 and 231 of the 1921 volume and page 34 of the 1922 volume of The Bulletin, and the carbon disulfid emulsion treatment. The work of the Japanese beetle investigators indicates that the emulsion is the better treatment to employ. We think you had better try to kill the grubs with one or the other remedy.

8. Getting Rid of Earthworms; Cinder Layers in Greens.—Will a 2-inch layer of charcoal at a depth of 4 inches beneath the surface of a green discourage or eliminate earthworms? (New York.)

Answer.—We do not think a 2-inch layer of charcoal in the green would at all worry the earthworms, but we do think it would make it extremely difficult for you to grow good turf. All of our results with artificial layers have been bad, and we advise strongly against them. Properly used, the corrosive sublimate method of eradicating earthworms is perfectly satisfactory. If care is not used you may burn the grass more or less. The method of applying corrosive sublimate is described on page

92 of the March, 1923, BULLETIN. Mowrah meal, a commercial commodity, is more expensive than corrosive sublimate, but is very efficacious. When used at the rate of 15 pounds to 1,000 square feet, and well watered in, mowrah meal will not burn the grass.

9. IMPROVING THE ROUGH ON POOR, GRAVELLY SOIL.—Our soil is gravelly and, like all abandoned farms of the mountain areas, is poor and sour, and a great deal of it is devoid of vegetation. When conditions are made favorable, bluegrass will grow luxuriantly in this section; hence we are not worrying about the fairways. On the greens we will use either a bent or a fescue grass. What we are worrying about is the rough. Part of the field has had redtop seeded the last few years and has a fairly good stand, which we could let go for the rough, but the part with practically no vegetation is what is troublesome to us. Of course we don't want to spend much money for fertilizing the rough, and we are wondering whether or not you have anything you would prefer to seed for the rough other than redtop, which we know will make some growth. What would you think of having the rough consist of poverty grass—"nigger wool" we call it? It grows luxuriantly in the mountains of Pennsylvania. From the standpoint of being easily taken care of and making an everlasting sod it would meet those requirements perfectly; but perhaps you may know of something better for the rough. (Pennsylvania.)

Answer.—It occurs to us that a little fertilizer together with some sheep's fescue seed will give you a rough that should be entirely satisfactory. Sheep's fescue is one of the best grasses that we know of for the rough, but of course it must have reasonably good conditions for the germination of its seed. It grows remarkably well on poor soils, which leads us to think that you will not have a great deal of difficulty even under the conditions you describe. Would it not be possible to give the bare soil which it is desired to convert into rough a light application of manure and sow it with a mixture of sheep's fescue and redtop in the proportion of 3 pounds of the former to 1 pound of the latter, at the rate of 75 to 100 pounds to the acre? Poverty grass makes a good rough but there is no seed of it available.

10. YARROW IN PUTTING GREENS.—The latter part of August we sowed a fine quality of creeping bent seed, without any mixture, and on many of the greens we now find an excessive amount of yarrow. The yarrow was without doubt in the bent seed, because the seed sown in the mounds and approaches shows no yarrow whatever. The seedsmen tell us that the yarrow will do no harm. In view of the fact that we wanted and paid for bent seed, we do not desire the yarrow. They tell me to do nothing with it. Our theory is to weed it now (September), as the yarrow can be easily extracted, and the patches left can be reseeded now rather than in the spring. If it is done in the spring we will not have the stand of grass that we would have if it were done at the present time. It is an important matter, because we expect to use these greens in July. Of course, weeding now will ruin some of the plants, but reseeding will take care of that; whereas if we prolong weeding until spring we will be so much behind. The greens have not yet been cut, and the yarrow plants can easily be weeded. Although the greens need cutting, two days of rain has prevented that work. Should we weed this yarrow now or leave it until the spring? (New York.)

Answer.—There is commonly more or less yarrow seed in South German mixed bent, and a little yarrow appears in practically every

putting green sown with this seed. Most of the seedsmen regard yarrow as desirable rather than undesirable. We see no objection to it and doubt seriously the advisability of your going to the trouble of weeding out what has appeared. Of course, in seeding a green you never secure absolute uniformity in color and texture, and what little yarrow will be in your greens we do not think will ever cause you a moment of sorrow if you leave it all there. Our advice would be to let the yarrow alone, or, if you are going to weed it, to do so immediately.

11. Effect on Soil of Continuous Use of Ammonium Sulfate.—We have been advised to make three applications of ammonium sulfate to our greens. Is there not danger when using ammoninm sulfate constantly of changing the condition of the humus content naturally in the soil and available as plant food, from an active to an inactive condition? (Illinois.)

Answer.—We have never observed bad effects from the long use of ammonium sulfate as a fertilizer for turf grasses, notwithstanding it has been shown in the growing of truck crops that the continued use of chemical fertilizers without anything else results in a toxic condition of the soil. Where, however, ammonium sulfate is used in conjunction with top-dressing, such a condition apparently never arises. We are of the opinion therefore that if your applications of ammonium sulfate are accompanied with top-dressings you will obtain only beneficial results from its continued use.

12. Potash Marl and Poultry Manure as Fertilizers.—What is your opinion as to the fertilizing value of potash marl and poultry manure? Last spring I used pulverized poultry manure on our greens with good results. (New York.)

Answer.—In our experiments we have found potash marl undesirable for use on putting greens. Poultry manure is a good fertilizer for greens; it is most advantageously used mixed in compost.

13. Size of Mesh for Compost Screen.—What is the proper mesh for a compost screen? (Kentucky.)

Answer.—We believe you will find ¼-inch mesh about the smallest you can employ satisfactorily. Material will feed through ⅛-inch mesh very slowly. Of course much depends on the type of material you are screening. For instance, if you were screening sand and wanted to get out small pebbles, you might use ⅛-inch mesh advantageously; but for ordinary compost we believe you will find ¼-inch mesh entirely satisfactory.

14. Combining Ammonium Sulfate, as a Fertilizer, With Corrosive Sublimate, as a Worm killer.—Would it be advisable for us to add ammonium sulfate to our mixture of corrosive sublimate and ammonium chloride? What we have in mind is the saving in time which would result by mixing and applying our fertilizer and our worm killer in a single operation. (Pennsylvania.)

Answer.—Our chemist advises that he does not know whether your chemicals would be effective when mixed as you propose, or not. It is a matter which can be determined only by experiment. His opinion, however, is that the addition of ammonium sulfate to the corrosive sublimate would make the latter less effective in killing earthworms.

15. Getting Rid of Chickweed.—Will sodium arsenate kill mouse-ear chickweed? (Ohio.)

Answer.—Sodium arsenate will kill all vegetation. So it must be used with care when applied to chickweed. Some greenkeepers are having excellent results by applying ammonium sulfate strong enough to burn the chickweed, but not seriously to injure the grass that is growing with it. It will take some experimenting and careful work to find just the right amount to use. It can be put on in solution with a sprinkling pot, or applied dry. Mouse-ear chickweed is a common pest, and the seed is likely to be everywhere. Usually in compost piles that have stood for a year the weed seeds are all destroyed.

16. Creeping Bent for Turf Tennis Courts.—Has creeping bent been used satisfactorily for turf tennis courts? (Indiana.)

Answer.—Some of the New England courts are turfed either with creeping bent or velvet bent, or both mixed. This turf, however, has been derived from seed. We know of no tennis court which has been developed by the vegetative method, but there is no reason why this should not be entirely satisfactory.

17. Discouraging the Growth of Clover.—Can you give us any information as to how to proceed and what to use to discourage the growth of clover on greens and fairways? (Maine.)

Answer.—The best means is the constant use of ammonium sulfate as a fertilizer and the avoidance of the use of lime and phosphates. The continued use of ammonium sulfate gives the soil an acid reaction, which is unfavorable to the growth of clover and to many of the weeds on golf courses.

18. Use of Stagnant Water Containing Weed Seeds, for Watering Greens.—For watering our greens we use stagnant water from an old river bottom the sides of which are overgrown with chickweed, plantain, dandelions, daisies, and other weeds, which appear in our greens toward the end of summer. Can you suggest a remedy for ridding the water of these weed seeds? (Massachusetts.)

Answer.—There are various kinds of filters on the market which will help to clear the water of weed seeds. Aside from this, we do not believe there can be any objection to using stagnant water on your greens.

19. Smoothing Up Approaches.—The sod around our greens is so rough that a pitch approach shot usually gives a bad kick. Would you advise rolling the approaches in order to smooth out the rough places? (Virginia.)

Answer.—Some rolling on the approaches to the green will no doubt make them smoother, but the most satisfactory treatment is to top-dress with good sandy loam. This can be spread from the back of a cart or wagon rather easily. It is easier to fill up depressions than to roll out the high points.

20. Making Ammonium Sulfate.—We have been informed that we can make our ammonium sulfate ourselves. Can you inform us as to how it is made? (New Jersey.)

Answer.—The commercial supply of ammonium sulfate is obtained as a by-product largely from smelting furnaces. It would be far more costly for you to attempt to make the material than to buy it.

Meditations of a Peripatetic Golfer

Methods of greenkeeping with some people are a matter of faith, not of observation and demonstration.

When a fellow comes along with some marvelous new secret method or remedy for grass trouble, the chances are 1,000 to 1 he is a quack.

A perfectly rectangular elevated putting green, guarded in front by two square bunkers! Evidently the architect intended to give the players a square deal.

Any golf course with really good turf is enjoyable to play. No golf course with poor turf ever pleases the players.

It staggers our imagination to guess at the architect's reason for building some types of putting greens we have seen.

Building a golf course on clay soil in wet weather!. No real farmer would ever be so foolish as to work clay soils when they are wet.

A really good 3-shot hole is a rarity. One that is not good, is silly.

A bunker may be visible and yet unfair; but a blind bunker is never fair.

The seed to sow all the ground on an 18-hole golf course, including bent for putting greens, should, at present prices, not cost over $2,000. Spending more money than this is foolish.

It is not fair to the greenkeeper to have him purchase supplies. Evil-minded critics will say he gets a commission. The club owes it to him to protect his reputation.