

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

Vol. V

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No. 2

## A MONTHLY PERIODICAL TO PROMOTE THE BETTERMENT OF GOLF COURSES

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## Fourth Annual Meeting of the Green Section

New York, January 9 and 10, 1925

The Fourth Annual Meeting of the Green Section was held in the Astor Hotel. At each of the sessions over 300 people were present, most of them either members of green committees, or greenkeepers. The program was as follows:

### Friday, January 9, 9:30 A. M.

Opening Remarks	Chairman Findlay S. Douglas, Metropolitan Golf Association, New York City.
Roll Call.	
Annual Report of the Chairman of the Green Committee of the United States Golf Association for 1924	Dr. C. V. Piper, Washington, D. C.
Business Meeting	
The Japanese Beetle	Mr. B. R. Leach, Entomologist, United States Department of Agriculture, Japanese Beetle Laboratory, Riverton, N. J.
Modernism vs. Fundamentalism in Green-keeping	Mr. E. J. Marshall, Inverness Club, Toledo, Ohio.
Known and Unknown Factors in Green-keeping	Dr. K. F. Kellerman, United States Department of Agriculture, Washington, D. C.

### Friday, January 9, 2 P. M.

The United States Golf Association and the Green Section	Mr. Wynant D. Vanderpool, President, United States Golf Association.
The Endowment Fund for the Green Section	Mr. James G. Blaine, Jr., New York City.
Acapulco Grass	Mr. Frederick Snare, Havana Country Club, Havana, Cuba.
Golf Turf in Britain	Dr. C. V. Piper, Washington, D. C.
Root Growth of Turf Grasses	Mr. O. B. Fitts, Washington, D. C.
Our Present Knowledge of Brown-Patch and its Control	Dr. R. A. Oakley, Washington, D. C.
Eradication of Earthworms (Motion Pictures).	

### Saturday, January 10, 9:30 A. M.

Local Green Section Work.	
Philadelphia	Mr. H. K. Read, Service Bureau, Philadelphia Green Section.
Cleveland	Mr. J. K. Bole, Chairman, Green Committee, Cleveland District Golf Association.
The New England Greenkeepers' Association	Mr. F. G. Wilson, President, Greenkeepers' Club of New England.
The Need for Enlarging the Green Section	Dr. C. V. Piper, Chairman, Green Committee, United States Golf Association.
Fertilizers in Relation to Quality of Turf and to Weed control	Dr. R. A. Oakley, Washington, D. C.

In addition to the announced program, an interesting address was made by Hon. George H. Clark, Commissioner, Seed Branch, Department of Agriculture, Ottawa, Canada, on "Turf Problems in Canada."

The more important of the papers and addresses will be published in **THE BULLETIN**.

Besides the regular program, there were shown at each session motion pictures of the great golfers.

## Annual Report of the Chairman of the Green Section of the United States Golf Association for the Year 1924

*To the Members of the Green Section:*

The fourth year's activity of the Green Section has met with increased appreciation from the golf clubs. This is reflected in a membership enlarged during the year by 152 clubs. Not only has there been increase in the number of member clubs, but there is a constantly wider range of

people asking for the assistance of the Green Section. The demand for service and information is far beyond our present ability to meet completely.

Your Chairman must again emphasize the necessity of enlarging the Green Section and of putting it on a more satisfactory basis financially. You are all aware of the effort now being made to secure an adequate endowment fund. Only with the success of this effort can the Green Section be put on a permanent basis. It can not hope to perform its functions in a satisfactory way indefinitely unless it does get greater financial support. It must train new men to carry on the work. It must be put in a position to aid *all* golf clubs by making a low subscription price for *THE BULLETIN*. It must cooperate with the state agricultural colleges, to broaden the scope of the experimental work and to avoid the dispersal of conflicting advice. Finally it must investigate a lot of problems which now perforce are neglected. Whether the work justifies the support necessary, the golf enthusiasts must decide and act accordingly. It should not be overlooked that under our present organization it is possible to get much scientific assistance without expense to the Green Section.

Very encouraging to the Green Section workers are the numerous letters of commendation continuously being received. In general the member clubs are highly appreciative of the aid given. This makes us the more desirous of rendering still greater service.

#### GREEN SECTION MEMBERSHIP

Number of clubs enrolled on December 31, 1923.....	653
Number of new clubs enrolled January 1 to December 31, 1924	172
<hr/>	
Total number enrolled to December 31, 1924.....	825
Number of clubs withdrawing January 1 to Dec. 31, 1924....	23
<hr/>	
Net number enrolled on December 31, 1924 .....	802
This enrollment of 802 clubs was made up as follows:	
United States clubs members of the U. S. Golf Association..	492
United States clubs not members of the U. S. Golf Association	262
Canadian clubs .....	42
Other foreign clubs .....	6
<hr/>	
Total .....	802

There are two interesting features disclosed by this list, namely, that 262 Green Section clubs are not members of the United States Golf Association and that 221 United States Golf Association clubs are not members of the Green Section.

The following figures also are of interest as regards the growth of the Green Section membership during the four years of its history:

Membership on December 31, 1921.....	287 clubs.
Membership on December 31, 1922.....	557 clubs.
Membership on December 31, 1923.....	653 clubs.
Membership on December 31, 1924.....	802 clubs.

If all of our members take sufficient interest we should have 1,000 clubs before the end of the year.

## THE BULLETIN

The 1924 volume of the monthly BULLETIN contained 304 pages exclusive of the index. Two copies have been sent regularly to each member club, and in addition 218 subscriptions were received for extra copies for the year for golfers who are members of clubs which are members of the Green Section and who, being interested in turf problems, desired to receive THE BULLETIN for use in connection with work on their own course. Indeed, in several instances clubs have sent in sufficient additional subscriptions so that a copy of THE BULLETIN would go direct to each member of the green committee as well as to the greenkeeper. THE BULLETIN is furnished gratis to Park Commissioners of cities supporting public golf courses, at the present time to 83 cities.

## FINANCIAL STATEMENT

A detailed financial statement for the Green Section for the year ending November 30, 1924, has already been published in the Report of the Executive Committee of the United States Golf Association. The statement may be summarized as follows:

Cash in bank November 30, 1923	-----	\$1,954.00
RECEIPTS		
Club dues	-----	13,073.11
Sales of BULLETINS, and special services	-----	2,217.45
Appropriations from the U. S. Golf Association	-----	3,300.00
		20,544.56
DISBURSEMENTS		
BULLETINS and binders	-----	\$2,941.01
Field service and office expenses (salaries, rent, travel, equipment, supplies, etc.)	-----	11,888.65
Payment on cooperation agreement with U. S. Department of Agriculture for 1923	-----	1,500.00
Payment on cooperation agreement with U. S. Department of Agriculture for 1924	-----	2,750.00
Foreign trip of C. V. Piper	-----	1,000.00
		20,079.66
Cash in bank November 30, 1924	-----	464.90

C. V. PIPER, *Chairman.*

### Hugh Irvine Wilson

1879—1925

It is with profound sorrow that we announce the death of Hugh Irvine Wilson, which occurred on Tuesday, February 3. He was a member of our Advisory Board, and in a large measure was responsible for the formation and success of the Green Section of the United States Golf Association. He was properly considered one of the best-informed men in the country on problems relating to the construction and maintenance of golf courses. Not only did he have a wealth of practical, first-hand experience, but he was also a close student, and in his research work he visited the principal courses abroad in seeking complete information. Probably no one has been consulted more frequently by those interested in this work. His passing represents a distinct loss, not only to the Green Section but to golf interests everywhere.

But next to his beloved family circle, the largest measure of loss and grief will fall upon those who have had the privilege of his personal acquaintance and good-fellowship. He was endowed with traits of character which set him apart. His modesty, cheerfulness, and genuine unselfishness endeared him to all who knew him. The feelings of his friends passed the

bounds of admiration and amounted to downright affection. No one went to him for counsel or advice who came away empty-handed. From the time he was a young man until the day of his death he suffered from physical handicaps which periodically brought him much pain and distress. He succeeded in keeping his personal tribulations from his friends, and showed them only a cheerful, helpful disposition such as is possessed by but few men. When he was consulted for advice, he had the happy faculty of giving it in a way that made you feel that he was favored by the call. His charity was of the kind that you would expect from him. Not only was he willing to help in a material way, but he showed a thoughtful consideration with regard to the comfort of those in distress; which made his benefactions the more acceptable.

The mature results of his studies in golf architecture are embodied in the East Course at Merion, which was remodelled under his direction in 1923-1924. It is safe to say that this course displays in a superb way all of the best ideas in recent golf architecture along the lines of its American development. For a long time to come the Merion course will be a Mecca to all serious students of golf architecture.

It has been said that "a prophet is never without honor save in his own country;" but this was not true of Hugh Wilson. In Philadelphia, where he lived and worked and played, were his closest and most affectionate friends. Of few other men can it be said more truthfully that "none knew him but to love him, none named him but to praise."

His loss represents a big gap in a very wide circle; but he leaves behind him a precious heritage of high regard and affectionate memories of kindness and helpfulness to his fellow-men.

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### A Suggestion about Trees To Plant

A gentleman in the nursery business writes us very interestingly in relation to the item at the bottom of page 275 of THE BULLETIN, October, 1923, concerning quick-growing trees. His suggestions appeal to us as excellent. Among them are the following:

"The poplars as a rule, with the exception of the lombardy poplar, which can be used only for tall formal growth, carry too large a leaf to be advisable to plant along the course unless sufficiently far away from the fairways that the leaves are not apt to blow over. The large leaves cause more loss of religion among the members of the clubs than anything else I know of, and I have endeavored, in our plantings, to make them with such varieties as carry a small leaf, or a leaf that shrivels quickly, so that when blown about it is not large enough to hide the ball.

"May I suggest for quick-growing trees, the paper, red, and yellow birch, American and green ash, honey locust, black locust, pin oak, scarlet oak, Salisburia, and American and English elms? All of these are fast-growing trees with foliage that is not detrimental to the fairways.

"May I also suggest that you can possibly help the clubs throughout the country in their planting, by carrying to them the idea of making some of their boundary planting decidedly in the line with the last suggestion in your BULLETIN, of planting trees and large shrubs that produce fruit for the winter birds? Of these you have given a good variety, but you can add to them the native viburnums, the native blueberry, the buck-thorn, and black thorn, bush honeysuckles, Japanese winterberry (*Ilex*

*sieboldii*), the Japanese barberry, and the native dogwoods, both the tree and the bush forms, the latter being commonly known as the osiers, all of which carry splendid fruit, are showy either in flower, foliage, or fruit, grow with little care, and make wonderful massed plantings."

## Outlet Boxes and Drain Tile Openings

By Charles E. Van Nest, Interlachen Country Club, Minneapolis

Prior to 1922, we used wooden boxes as outlet openings for our hose connections. Cleats near the top of the box served as a support for a board cover. The openings for our drain tile were finished in the same manner, except that screens took the place of the board covers. Owing to wash-outs, decay, breakage, and the action of frost, these openings were a constant annoyance to players and a source of trouble and expense to the grounds department. As a result, it was decided that, notwithstanding the first cost might be greatly increased, the building of something of a permanent nature would be advisable.

We purchased 10-inch iron man-hole rings and covers from a local foundry. We set these, in concrete, flush with the surface of the ground. For pouring the concrete, we used as a form a sheet iron cylinder of the proper size to fit the ring and about 18 inches long, a hole having been excavated around the outlet opening to that depth. We were careful to leave an opening around the pipe where it entered the well, so that in case of trouble the pipe could be moved without injury to the wall. Our water mains are from a few inches to a foot below the surface. The details of the installation are shown in the sketch on the opposite page.

During the three years we have used this construction we have not made a single repair. Tractor wheels pass over the covers without harm, and water and frost seem to have had no bad effects. Our soil is a very heavy clay.

In small lots, sets of ring and cover cost \$2.80 each, but in quantities of 50 or more, we have a price of \$2.52. To this, of course, must be added the cost of concrete and labor, which, however, is very small.

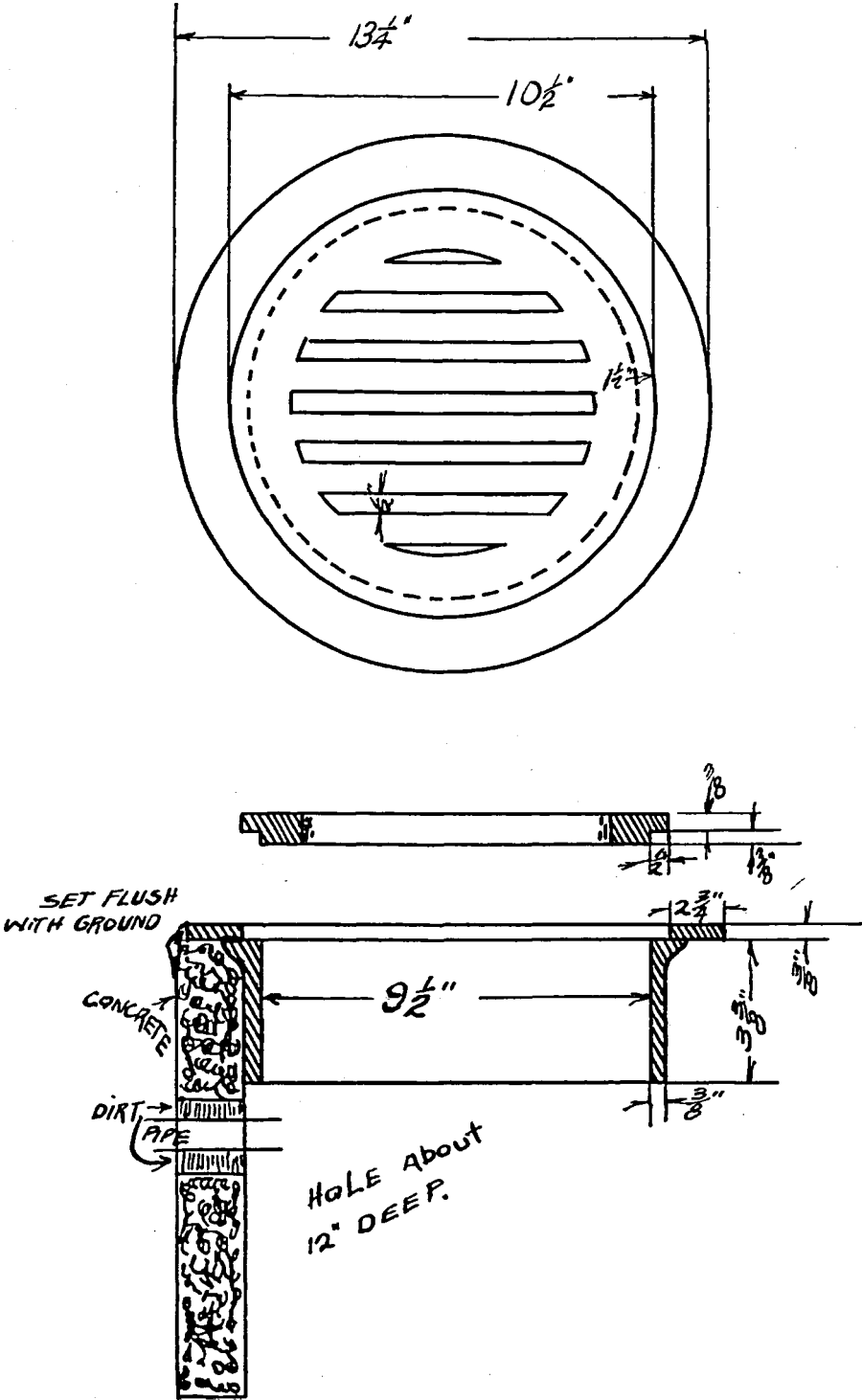
We plan on piping through the middle of our fairways in the spring, and shall have an outlet every 150 feet protected in this manner.

## Wholesale Turf Seed Prices January 31, 1925

Prices per 100 Pounds for Best Grades of Seed

Obtained by the Seed Reporting Service, U. S. Department of Agriculture.

	New York	Balti- more	Phila- delphia	Rich- mond	Buf- falo	Chi- cago	Minne- apolis
German mixed bent	\$55.00	\$75.00	\$60.00	\$55.00	\$55.00	\$55.00	\$57.00
Kentucky bluegrass	28.00	28.50	29.00	31.00	28.75	28.50	30.00
Redtop	14.50	14.00	14.50	14.00	14.50	14.50	16.00
Red fescue	-----	22.00	20.00	22.00	22.00	-----	20.00
Chewings' fescue	20.50	-----	20.00	-----	22.00	20.00	22.00
Sheeps' fescue	14.00	17.00	15.00	17.50	14.00	14.00	16.00
Canada bluegrass	20.00	21.50	21.00	-----	20.50	21.00	22.00
Italian rye grass	11.00	11.00	11.50	12.00	12.00	12.50	12.00
Perennial rye grass	11.50	12.25	13.00	11.50	11.50	13.00	11.00
White clover	48.00	48.00	48.00	58.00	49.00	47.00	50.00



Iron man-ho'e outlet box

## Cost of Maintaining a Golf Course

By J. S. Clapper, Minneapolis Golf Club, Minneapolis

There is much interest in the question "What is a reasonable sum on which to maintain a golf course?" To obtain data on this subject, inquiries were addressed to 100 clubs in all sections of the United States. The desired information was submitted by 62 of the clubs addressed. A tabulation of the data obtained from these 62 clubs is given below. Under "annual expenditure" is included cost of labor, supplies, and maintenance equipment.

	39 Courses 18-hole	23 Courses 9-hole
Total of annual expenditures reported by all clubs-----	\$806,476.00	\$204,378.00
Average annual expenditure for all clubs-----	20,679.00	8,886.00
Highest annual expenditure reported by any one club-----	46,500.00	25,000.00
Second highest annual expenditure reported by any one club-----	44,759.00	16,340.00
Second lowest annual expenditure reported by any one club-----	8,500.00	1,225.00
Lowest annual expenditure reported by any one club-----	6,000.00	1,180.00
Total of annual payments for greenkeepers' salaries-----	80,532.00	31,312.00
Average annual payment for greenkeeper's salary-----	2,264.00	1,423.00
Highest salary paid to a greenkeeper-----	7,500.00	2,700.00
Second highest salary paid to a greenkeeper-----	3,300.00	1,925.00
Lowest salary paid to a greenkeeper-----	1,000.00	660.00
Total of annual expenditures for seed and fertilizer-----	41,246.00	7,612.00
Highest annual expenditure for seed and fertilizer-----	3,300.00	900.00
Lowest annual expenditure for seed and fertilizer-----	111.00	85.00
Greatest number of men employed by any one club-----	22	12
Second greatest number of men employed by any one club-----	15	10
Least number of men employed by any one club-----	5	2
Highest rate paid per day-----	\$5.50	\$5.00
Average rate paid per day-----	3.92	3.93
Lowest rate paid per day-----	2.25	3.00
Annual expenditure of clubs:		
Number of clubs expending between \$50,000 and \$40,000-----	2	
Number of clubs expending between 40,000 and 30,000-----	6	
Number of clubs expending between 30,000 and 20,000-----	11	1
Number of clubs expending between 20,000 and 15,000-----	8	4
Number of clubs expending between 15,000 and 10,000-----	10	3
Number of clubs expending between 10,000 and 5,000-----	2	7
Number of clubs expending between 5,000 and 3,000-----		4
Number of clubs expending below \$3,000-----		4
One club reports \$15,000 expended on the course only.		
Number of clubs failing to report greenkeeper's salary-----	3	1
Number of clubs failing to report number of men employed-----	2	1
Number of clubs failing to report expenditure for seed and fertilizer-----	3	4

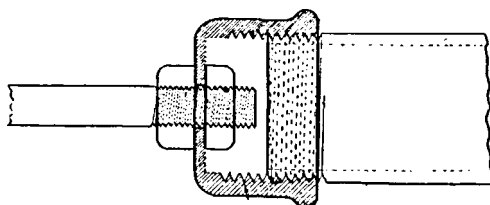
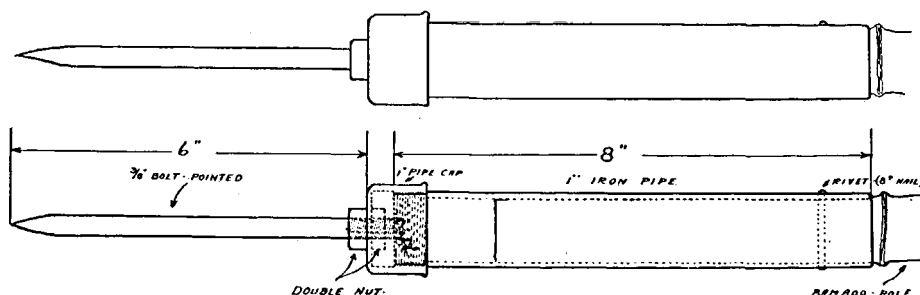
## Flag Pole Socket

By John Quail, Greenkeeper, Highland Country Club, Bellevue, Pa.

The accompanying sketch shows a flag pole socket which we made ourselves out of material we had on hand. It is very simple to make and promises to answer the purpose satisfactorily. It consists of a piece of 1-inch



iron pipe 8 inches long, threaded on one end, and a 1-inch iron pipe cap with a hole drilled in the center large enough to take care of a  $\frac{3}{8}$ -inch bolt 7 inches long with two nuts. The bolt is fastened to the cap by using a nut on the inside and a nut on the outside of the cap. The bolt can be heated and forged to a point, or ground down on an emery wheel. A hole is drilled in the pipe large enough for the insertion of an 8-penny nail as a



Flag pole socket.

rivet to hold the pole. The end of the pipe can be heated and swelled large enough to permit of the insertion of the ordinary bamboo pole in the end to a depth of 6 inches, which makes it very rigid.

## A Proportioning Machine for Use in Applying Chemicals

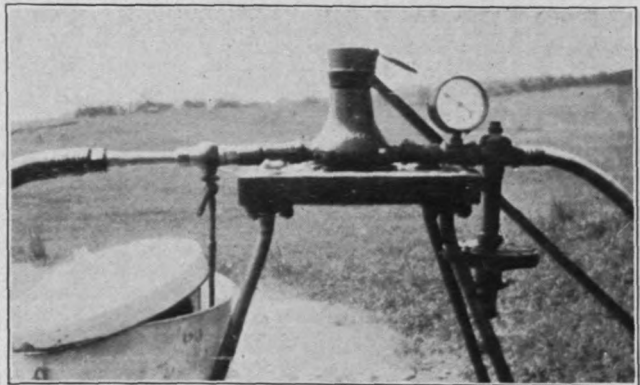
By Hugh I. Wilson, Merion Cricket Club, Haverford, Pa.

There have been great difficulties in applying chemicals on golf courses, owing to the fact that either a hand pump had to be employed or else some larger and expensive spraying machine used. Either method meant a great deal of expense. A proportioning machine is now on the market\* which permits the application of carbon disulfid emulsion, as well as other chemicals, in a very simple and easy manner. We have tried the machine out at Merion and have found it extremely simple and successful. A green can be sprayed by one man in 15 minutes if the chemical is soluble in water; otherwise it may require the services of two men, one to stir and the other to use the hose. The machine should certainly be of great value in fighting the Japanese beetle grub in putting greens.

The illustrations on page 34 show the machine in use on a New Jersey golf course. It operates on the principle of a siphon injector.

\*The address of the manufacturers will be furnished upon application to the Green Section.

Water going through the nozzle at a high rate of speed and in large volume is directed against the outlet in a manner which will continue to force the liquid against resistance by converting the kinetic energy into a pressure head, and will at the same time draw up, on the principle of an injector, a quantity of solution or emulsion. In order to keep the ratio of water to the solution or emulsion constant, a pressure regulating valve is placed in the line above the equipment, and is made an integral part of the equipment. The quantity of liquid sucked into the mixing chamber is controlled and regulated by an indicating cock. This combination gives a mechanical control. It is claimed that with the machine a perfect emulsion may be obtained automatically. The chemical to be emulsified is sucked directly from the container into the stream of water, by which process the emulsification takes place. It is not necessary to have high pressure, as the apparatus will operate with pressure as low as 15 pounds. A meter is attached to determine the quantity of water being used. The suction pipe is equipped with a screen. A screen is also furnished to be stretched over the container to prevent grass and other foreign material contaminating the solution (this screen is omitted from the container in the illustration).



Applying carbon disulfid emulsion prepared in a proportioning machine. The machine is shown on the reader's right.

The machine is furnished in two sizes. The larger size is shown in the illustration. It is claimed to be capable of applying 700 gallons of liquid per hour through a 1-inch hose 100 feet in length with a pressure of 25 pounds given. With the smaller size 280 gallons per hour have been applied through a  $\frac{3}{4}$ -inch hose 100 feet long with a rose nozzle on the end, with a pressure of 15 pounds provided. The smaller size may be carried by hand or in a wheelbarrow and operated by one man without any difficulty. A container is also furnished for the machine (not shown in the illustration), which with the larger machine may fit directly underneath the apparatus; the smaller machine being mounted directly on the container.

Further tests are desirable before the practical worth of the machine can be definitely established, but it at least bids fair to become a valuable adjunct in greenkeeping.

## **The Low Plant Food Value of Peat**

**By K. F. Kellerman**

The question of the suitability of peat for top-dressing is frequently raised, sometimes with the suggestion that the peat be combined with manure or compost. The widespread interest in peat and the rather general belief that it has unusual value for plant food is due, in part at least, to apparent analogies that are not real. For example, the areas resulting from the drainage of ponds or lakes frequently have a high productivity. River bottoms ordinarily are regarded as the richest lands in a given region, and these conditions naturally suggest that water-borne materials or materials decomposing under water contain rich plant foods. A distinction should be made, however, between silt or muck deposits, and peat.

Although peat deposits are usually dark in color, frequently as black as any muck or river bottom land would be, they contain practically no mineral plant food. Pure peat is the residue of plant material decayed under water or near water level, and the characteristics of any particular deposit of peat will vary depending upon the kind of plant growth that has been accumulating and decaying, as well as upon the conditions of the bog or swamp in which the deposit has developed. If considerable quantities of clay or silt have been washed in and deposited with the peat, the deposit can not be regarded as a true peat. It is these silty peats that ordinarily are found most satisfactory for truck gardening or other forms of intensive crop production.

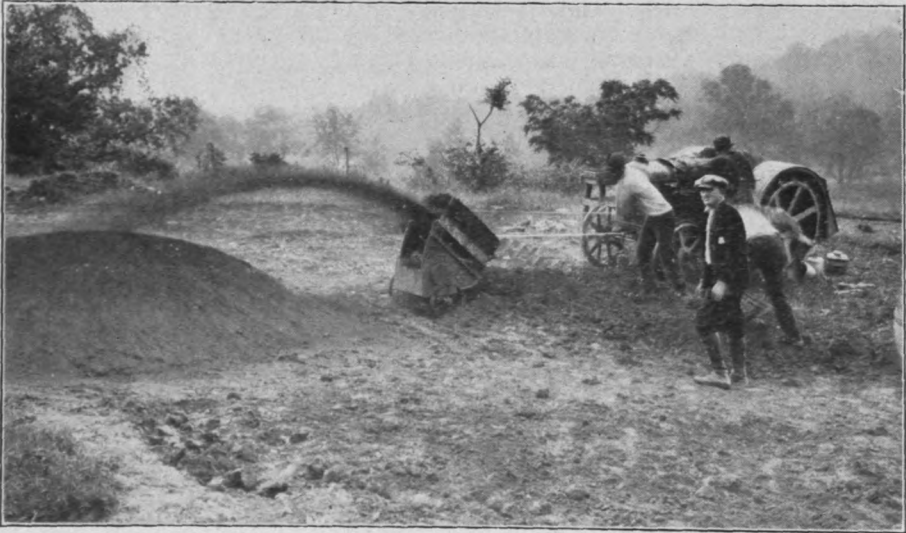
In considering the use of peat it is important to remember that peat deposits represent only the remains of a very complete decay and disintegration of the plant materials. A peat deposit may be black in appearance, very much like well-rotted manure, but when we speak of thoroughly rotted manure we are dealing with a condition entirely different. Well-rotted manure is, after all, manure only partially decayed. It is full of bacteria, molds, and other organisms, and the chemical plant foods contained in manure are being changed more or less rapidly and being made available for absorption by plant roots. This condition does not exist in peat. Very few bacteria are present; and, although plant food elements may be found in the peat by chemical analysis, unfortunately these elements are not in available form for plant roots to absorb them. There are some peat deposits that show a percentage of nitrogen, for example, as high as four per cent, yet that nitrogen is not available and therefore of no benefit and has no food value for a growing plant. The nitrogen in manure or commercial fertilizers, however, can be readily and completely used.

In the same way that an analogy apparently has existed in the minds of people between well-rotted manure and peat, there has existed a somewhat similar analogy between humus and peat. The importance of having humus in a rich soil has been frequently commented upon, and in color and general appearance and in some chemical peculiarities humus and peat are similar. The humus that we are interested in in a fertile soil, however, is again comparable to the rotted manure. In other words, it is not completely decayed but is vegetable matter in the process of continuing decay.

Undoubtedly there are conditions where peat can be made to serve a very useful purpose; as a conditioner for fertilizers, as a material to mix with compost or soil to provide a convenient potting soil for greenhouse

use, for diluting a compost heap in order to make it possible to apply a light compost dressing over an extensive area, and possibly for numerous other purposes peat of good quality may have a considerable value. There are peat deposits, however, that because of infiltration with bog iron or other materials may be actually injurious to plants. In using any peat deposit, therefore, it is important to learn something of that particular deposit. It is doubtful if the use of peat on clay soils, either as a top-dressing or as a mixture in an effort to improve the physical condition of the surface, is ever advantageous.

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A compost and soil sifting machine which was tried out during the season of 1924. It is claimed that this machine in one case screened more top soil at a labor cost of \$15.50 than was screened through a rotary screen by 5 men over a period of 3 weeks, at a labor cost of \$455.

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## Destroying Pocket Gophers

By W. B. Bell, U. S. Biological Survey

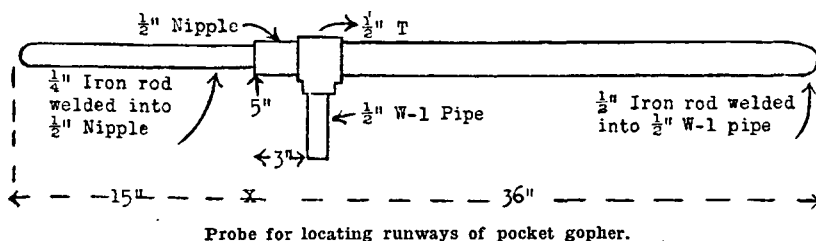
Pocket gophers are readily caught in any one of several makes of special traps commonly on the market, and a few traps will be all that are necessary to keep small areas free of these pests. For larger areas, such as fairways, a very successful and much more practical method is to poison the rodents by use of baits of vegetables or grain. Either the vegetable or the grain bait gives splendid results, but some gophers will not eat a poison bait, and these individuals must be trapped.

The following formulas for preparing poison baits have been developed by the Biological Survey of the Department of Agriculture and have been found to be very effective:

For a vegetable bait, cut carrots, sweet potatoes, or parsnips about 2 inches long and  $\frac{1}{2}$  inch square, and wash and drain the cuttings. From a pepper box sift slowly a mixture of  $\frac{1}{8}$  ounce of powdered strychnine alkaloid and  $\frac{1}{10}$  ounce of saccharin over about 4 quarts of the dampened baits, stirring the baits to distribute the poison evenly.

For a grain bait, oats, rolled barley, milo, or feterita are recommended. Dissolve 1 heaping tablespoonful of dry gloss starch in a little cold water and to this add  $\frac{3}{4}$  pint of hot water. Boil, stirring constantly until a thin clear paste is formed. Mix together 1 ounce of powdered strychnine alkaloid and 1 ounce of baking soda, and sift this mixture into the hot starch paste and stir thoroughly to a smooth creamy mass. Add  $\frac{1}{4}$  pint of corn syrup, 1 tablespoonful of glycerine, and  $\frac{1}{10}$  ounce of saccharin, and stir well. Pour this mixture over 13 quarts of the grain selected, and mix thoroughly so that each grain is evenly coated. Allow to dry before using. It is important that only the best grade of thoroughly clean grain be used, as chaff absorbs and wastes much valuable strychnine, and useful birds will be endangered from poisoned weed seeds which the grain may contain.

One or two of the vegetable baits, or a tablespoonful of the grain bait, is dropped through a hole made into the runway. For locating the runs, which are usually 4 to 8 inches beneath the surface, and for making the hole, use a probe made of any strong handle, 1 inch in diameter and 36 inches long. A useful instrument for this purpose is here illustrated. One



Probe for locating runways of pocket gopher.

end should be pointed bluntly. Into the other end should be fitted a piece of  $\frac{1}{4}$ -inch iron rod, protruding about 15 inches and bluntly pointed. A foot-rest aids in probing hard soils. By forcing the iron rod down near the pocket gophers' workings or a foot or two back of their fresh mounds, the open tunnel can be detected as the point of the rod breaks into it. The blunt end of the instrument is then used carefully to enlarge the hole. After the bait is put in place, the probe hole is closed.

If a shovel is used instead of a probe to locate the runways, care should be taken not to disturb the runway more than necessary, and the hole should be closed so as to keep out the light, care being taken that loose dirt does not fall upon the baits placed in the runway.

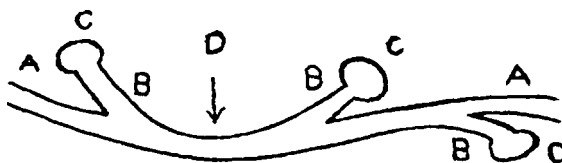


Diagram of portion of pocket gopher's workings.

- A.—Main runway, where the poison should be placed.
- B.—Laterals, where it should not be placed.
- C.—Mounds made by the pocket gopher, usually indicating the direction of the lateral. The lateral should be followed by means of the probe until the main runway is found. The lateral may vary from 6 inches to 4 feet in length.
- D.—Point where probe is used and bait dropped.

One soon becomes expert in locating the runs, and a man can treat 300 to 500 pocket-gopher workings in a day. Baits need be placed only at two points in each separate system of 10 to 30 mounds, which is usually the home of a single pocket gopher. Experience has shown that baits placed fairly in the open runs usually kill the animals. About 2 days after putting out the poison all mounds should be leveled. This permits grass to grow and makes it easy to discover by fresh mounds the location of any animal that may not have been killed and which requires additional effort to destroy.

*Caution.*—All poison containers and all utensils used in the preparations of poisons should, until thoroughly cleaned, be kept plainly labeled and out of reach of children, irresponsible persons, and livestock.

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## **Taking Care of an Eighteen-Hole Course with Nine Men**

**By Joseph Valentine, Greenkeeper, Merion Cricket Club, Haverford, Pa.**

I believe that any 18-hole golf course in the country can be kept in first-class condition with 9 men used in the manner outlined below, provided they are supplied with the best equipment.

At least four men are required for keeping the putting greens in proper condition. They should first poll the greens of worm casts, dirt, and other debris. They should then mow them, using mowers with 16-inch cut. To do that work thoroughly would take up the entire morning, this including also the early morning watering in the summer months. In the afternoon, these men should be employed in doing the top-dressing, fertilizing, weeding, spraying, and any other work necessary on the greens. This estimate is based on putting greens averaging at least 6,500 square feet in size.

One man should do nothing else but take care of the cups and moving the tee markers every morning. The cups should be moved at least every Monday, Thursday, Saturday, and holiday, and, indeed, more often if necessary. His afternoons should be used in helping the men working on the putting greens, or in any other important work that may come up.

One man should be used in taking care of the fairways and the large tees, with a tractor. When through mowing the fairways and the large tees he should be used on the rough.

One man, with a truck, should do all the hauling. He should haul the top-dressing where it is needed, haul the cut grass from the green, haul the sand that is needed, and haul any other material necessary.

Two men with scythes, rakes, mowers, and other necessary equipment, should look after the creeks and bunkers. They should mow the approaches to the putting greens and such tees as can not be mowed with the tractor. As soon as the dry season comes on, one of these two men should be employed at nights watering the greens.

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## **Greenkeepers' Register**

We have the names of a number of greenkeepers who have recently indicated their availability for employment. These names will be gladly given to any club upon request.

We shall be glad to list the names of additional greenkeepers who are seeking positions, provided a statement as to age and experience and the names and addresses of references are furnished with the application.

## Yarrow as a Putting Turf

Mr. Don F. Kennedy, formerly chairman of the green committee of the Beach Grove Country Club, Walkerville, Ontario, contributes the following interesting information on the satisfaction that yarrow as a putting turf is giving on the Beach Grove course. In a good many places in the country very satisfactory turf of yarrow has been found on putting greens. Our present attitude toward yarrow is that under most conditions it is not objectionable, but that it does not possess enough real merit to make it really worth while to endeavor to secure pure yarrow greens. The seed of yarrow on the market is of a different strain from the yarrow coming with German mixed bent seed, being much coarser than the latter. There is no doubt that under some conditions yarrow may be highly desirable. It is much better in soils of a sandy type than on the heavier soils. We quote from Mr. Kennedy's letter:

"Your BULLETIN of May 22, 1924, contained a query from a New York course (Question 10, page 129) regarding yarrow which came up in their putting greens, apparently as a result of being mixed in with creeping bent seed. The club was quite worried about the yarrow and undecided as to whether to weed it out at that time (September) or to wait until the following spring. Your advice was to let the yarrow alone, not considering it objectionable.

"Three or four years ago the writer was chairman of the green committee of the Beach Grove Country Club, Walkerville, Ontario, while the course was being constructed. During an inspection trip covering a number of Canadian courses, I noticed on the beautiful greens of the Ancaster Course, at Hamilton (which, by the way, is my idea of the closest approach to perfection in turf that I have ever seen), a small closely knit grass or weed resembling a miniature fern. The plant grew so thickly together that it was almost impossible to see down into the roots, and made a perfect-textured putting surface. On inquiry, I found that this plant was called yarrow, which was the first time I had ever heard the term. All of the greens had some of the yarrow, and many of them, as I recall it, contained as much as 30 to 50 per cent.

"I then endeavored to get some yarrow seed for use on our course the following summer, and after writing to perhaps a dozen seed houses in both United States and Canada finally located what appeared to be the only commercial stock for sale, which was a lot of 25 pounds and of which I was offered not over five pounds at \$3.50 per pound, which I purchased.

"The seed looked like mustard seed in size and appearance. I promptly trotted it to the greenkeeper, and then my troubles began. The greenkeeper was English and had never heard of yarrow being sowed in greens, and accordingly saw no reason why yarrow should ever be sowed in greens. I let the matter rest for a week or two and then tried him out again. Needless to say, he was still of the same opinion. Being unable to persuade him to use the yarrow, I finally instructed him to do so on one green only, which was one green that did not come through the first winter successfully. It looked as though this green was going to be a total loss for the season anyway, and I figured that a little experimenting couldn't make it any worse.

"Being busy with other matters, I forgot this one for two or three weeks and finally when I inquired as to how the seed had gone, I was told that the weather had been wet or dry or something and that he had not

put it in yet. Subsequent inquiries every couple of weeks brought forth different excuses, but put no seed in the ground.

"Finally, after waiting until about the first of July, I got the greenkeeper by the hand, went up into the tool shed, and got him to dig out the five pounds of yarrow. Together we went over to the bad green and cautiously scattered perhaps two pounds of it, gave it a slight top-dressing, and put our further faith in the Lord. In about three weeks the yarrow started, and then it kept on growing. The yarrow seemed to help the other grass as well, and by the first of September our wrecked green was the best one on the course. The yarrow seemed to disperse itself about quickly with the other grass (mostly New Zealand fescue), filled up all the bare spots, and made a beautiful putting surface.

"I forgot about the matter for some little time, when one day the greenkeeper rather diffidently came to me and wanted to know if I didn't think I could get him a little more yarrow seed. I asked him what he had done with the remaining three pounds and as an answer he took me to three other greens where he had scattered it and where it had already begun to help. We succeeded in getting, I believe, another 25 pounds, which was scattered pretty well over all the greens. That was three years ago. Yarrow is still going strong and is spreading slowly. The more it spreads, the better we will like it.

"The front half of our course is quite sandy and the back of it is heavy clay. All of our greens were built up on a foundation of perhaps from 12 to 28 or 30 inches of sod chunks and similar matter, with a layer on top of that of 6 to 8 inches of mixed loam. This mixture was aimed to be about half way between clay and sand, so that the results we got from yarrow on our putting greens were in reality little influenced by our natural type of soil."

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

QUESTION.—A and B were engaged in a close match. At the seventeenth green the lights and shadows made the line of putt difficult. A asked his caddy to stand with his heels together behind the hole to show him the line of putt. B objected, claiming it was against the Rules of Golf so to aid the playing of a putt. B said that the hole could be indicated only with the flag. Was A within his rights?

ANSWER.—B has no basis for his objection, as A was well within his rights to have his caddy stand with his heels together behind the hole. This is of course taking for granted that the caddy was not touching the ground with a club or doing anything to indicate the line of the putt that would be in a manner in violation of the Rules of Golf.

QUESTION.—Is it permissible on the putting green to remove a worm cast in the line of a putt? If it is, may a person use the back of his hand or the sole of his putter lightly to brush the cast aside? I recall that there is a rule which specifies that one may not touch his line of putt, and which apparently would indicate that the worm cast must be let to remain and not to be touched.

ANSWER.—Paragraph 2 under Rule 28 covers this point clearly. It is not permissible to use the back of one's hand to remove loose impediments on the putting green.

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The Green Section needs more money, and one desirable way to secure this is to get more golf clubs to become members. Over 800 clubs are members of the Green Section; about 2,000 are not members.

Won't you get busy with some of these non-member clubs and induce them to join?

Remember, the Green Section is a mutual-benefit association, and you ought to do all you can to get other clubs to enjoy the benefits, and at the same time enhance the benefits to your own club.

If you will send us names of men who you think ought to be interested in our work we will be glad to write them.

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## Slopes, Their Use and Abuse

By A. C. M. Croome\*

There is something mysterious about the character of golfing holes. Why should one by common consent be considered preeminently good, and another which is very similar in its more salient features regarded generally as unsatisfactory? For instance, the High-Hole-In, or Eden Hole, on the Old Course at St. Andrews, the eleventh of the round, is believed by all Scotsmen to be the best short hole in the world. I am pure-bred English myself, but I admit that I have never played at a better. Within a few hundred yards of it on the New Course a conscientious attempt has been made to duplicate it. The size and slope of the putting green have been reproduced by aid of the yard measure and theodolite. The distance from tee to pin is exactly the same. Hazards have been made, which by their position ought to exercise precisely the same influence on the play as the Hill Bunker, Strath, and the Shelly (or Cockle) bunker do at the hole by the Eden River. But the feelings of the player at the two places are entirely different before and after he has struck his tee shot, subsequent niblick shots, if any, and putts. The tee shot to the High Hole, by the way, is not made any easier by the fact that you generally have to wait for two or three matches to get away before you frame up to it. Consequently you are liable to be reminded by ocular demonstration of the various ways of getting into trouble. For this and other reasons you step forward hoping that you will take the right club and play the right shot. And if you give yourself a putt for a two you talk about it later in the club house. But everybody who is anybody confidently expects to get a three at the thirteenth on the New Course, and is ready to kick himself if he doesn't. Yet the only salient point of difference between the two holes is that the ground in front of the green on the Old Course is much harder and faster. So also is the green itself. But that does not explain why it should be so much more difficult to judge distance there, why Strath should be a few yards farther off than it looks, while his counterpart on the New Course merely serves to guide the eye of the player on the teeing-ground.

One might have thought that people would have realized from this example the futility of attempting to imitate an unique *chef-d'oeuvre* of Nature. But the fact is that a large proportion of modern courses are more or less spoiled by the introduction of the High-Hole-In model into the round. Constructors seem to search for plateaus on which to make

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\*Mr. Croome is a member of the Rules of Golf Committee of the Royal and Ancient Golf Club, captain of the Oxford and Cambridge Golfing Society, and one of the regular readers of The Bulletin in England.—Editors.

their putting greens, and to be quite careless about the angle of the slopes leading up to them. Having found one they dig a bunker in the right-hand near corner of it, and another to correspond on the left. The result is a handsome spectacle but seldom a good hole. It stands to reason that when play to a hole finishes up-hill the fate of a given shot is in a greater or less degree on the knees of the gods. A ball pitching against a fronting slope may stop practically dead, or run unexpectedly far, from causes entirely outside the control of the striker. Little inequalities in ground sloping away from him do not diminish, rather do they increase, his mastery of his fate. It is a significant fact that the finish of the play to at least twelve of the other seventeen holes on St. Andrews' Old Course is slightly downhill. It is not to be wondered at then that a player is worried by having to play at holes which look about fifty times as fine as they are, and do not in actual play pass the supreme test. This test is to be found in the attitude of mind assumed by a good golfer after he has taken the hole, which is up for judgment, in the par figure. Is he exhilarated by the knowledge that he has done the job himself unaided by any outside agency, that he has put the ball right and it has stayed put? And did he know from the moment it left his club that stay put it would? Within my recollection specimens of these spectacular plateau holes, finishing up more or less steep slopes, have been introduced on a number of first-rate courses—Hoylake, Muirfield, Westward Ho!, Sandwich, to mention only those on which championships are played. I have never heard anybody pick one of them when he has been asked to name the best hole of the round, or even take one of them into consideration. And yet some, for example the sixth at Westward Ho! and the tenth at Sandwich, are awfully good of their kind. The moral is obvious.

### 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. SPRING WORK ON NORTHERN FAIRWAYS.—We should like your advice in regard to improving our fairways. The grass is nearly all Kentucky bluegrass, with here and there patches of Rhode Island bent. We have thought of applying bone meal early in the spring at the rate of about 500 pounds per acre, following this with another application about a month later. We have no compost pile, but are planning to make one in the spring, and the following year to use this compost in the spring as a top-dressing, after seeding, and then to roll, and follow in about a month with an application of bone meal or ammonium sulfate. We prefer to seed in the spring rather than in the fall, as there is almost no play on our course before July 1, and the maximum play is during the fall. Would

it be advisable to add bone meal, ammonium sulfate, or lime to the compost pile? What kind of seed would you advise us to use? What method do you recommend for spreading bone meal and top-dressing?—(New Hampshire.)

ANSWER.—Although fall sowing is much to be preferred, if you decide to sow some seed we would advise you to use German mixed bent, as the bents should make excellent fairways under your conditions. Our experience indicates that it does not pay to sow Kentucky bluegrass seed on established turf. We would advise you also to save your money for fertilizer and compost, rather than to spend it for seed, as more can be accomplished in thickening a stand of grass by top-dressing and fertilizing, than by sowing additional seed. Bone meal would be an excellent fertilizer for you to use. It should be applied at the rate of 300 to 500 pounds per acre. Fertilizers are best applied with a regular fertilizer spreader, although a manure or lime spreader will answer very well. If you do not have these implements, the material can well be applied by hand. We do not think two applications of fertilizer a season are necessary. Excellent results have been obtained by mixing ammonium sulfate with soil and manure in starting compost piles, and we would advise you to use ammonium sulfate in your compost when you start your pile, using it at the rate of 100 pounds per ton of dry vegetable matter in the compost. If you use manure instead of straw or other dry matter, the amount of ammonium sulfate should be decreased per ton of manure, since manure contains considerable moisture and is therefore heavier than an equal bulk of dry matter. Aside from its fertilizing value, the ammonium sulfate materially hastens the decomposition of vegetable matter in a compost pile, thus making it ready for use much sooner than otherwise.

2. EFFECT OF LIME IN ENCOURAGING WHITE CLOVER; APPLYING AMMONIUM SULFATE IN RIDDING GREENS OF WHITE CLOVER.—Kindly inform us as to the best method of ridding greens of white clover. Our greens were limed last winter and fertilized regularly during the past season. (New Jersey.)

ANSWER.—The best way to encourage the growth of clover is to use lime, and there is no doubt but that your applications of lime have resulted in the prevalence of the clover. In fact, the use of any alkaline fertilizer is likely to result in the encouragement of clover as well as various weeds. There is abundant evidence, however, that with the continued use of ammonium sulfate white clover, chickweed, and many other turf weeds will disappear. We would recommend that you give your greens applications of ammonium sulfate at least four times a year, once in early spring, once in late spring, once in midsummer, and once in early fall. For each of the spring and fall applications we would apply it at the rate of 3 to 5 pounds per 1,000 square feet, and for the midsummer application at the rate of  $1\frac{1}{2}$  pounds per 1,000 square feet. The ammonium sulfate may be mixed with compost, and the compost thus treated applied at the rate of 1 cubic yard to from 3,000 to 5,000 square feet of putting green surface. In other words, for the spring and fall applications 15 to 25 pounds of ammonium sulfate may be mixed with 1 cubic yard of compost, and for the midsummer application 7 or 8 pounds, and the mixture applied to approximately 5,000 square feet of surface. After the mixture is applied, the greens should be watered thoroughly, to avoid burning the grass. This is particularly important in the case of the midsummer application. Still

better results may be obtained by more frequent, but lighter, applications of ammonium sulfate, provided facilities for the work are available.

3. PREPARATION OF SOIL FOR PUTTING GREENS; TREATMENT OF SOIL WHICH TENDS TO BAKE.—Our soil is a loam with clay subsoil, and our climate rather dry. What would be your recommendations for preparing this soil for putting green construction? We have a fair growth of grass on a number of our greens, but the surface seems to get hard and bake in the heat of the sun unless the turf is kept constantly soaked with water, and even when this is attempted the water does not seem to penetrate the soil. The application of sand to the greens has been recommended, but we are at a loss to understand how to introduce this sand into the soil without destroying the greens. Are there implements suitable for this purpose? How often would you recommend top-dressing, and in what manner? (Saskatoon.)

ANSWER.—We believe you will have no trouble in getting a good seed bed for your greens from your prairie loam soil, provided it is used as top soil. If it is found necessary to fill for the greens, your ordinary subsoil should be entirely satisfactory. There is difference of opinion as to the proper depth of the surface layer of soil, but 4 to 6 inches is certainly ample. The surface of the green, of course, should be well drained, even in a dry climate. The subject of surface soil for putting greens has been treated in the article in *THE BULLETIN*, Vol. IV (1924), page 141. Our experience of the past few years, gained largely from careful experimentation, indicates that it is not so much the kind of soil upon which the seed is sown or stolons are planted, as the kind of soil that is put on afterward as a top-dressing, which determines the character of the turf. We would not advise you to use pure sand as a top-dressing, as we find it has a tendency to remain in layers and form a hard surface. It also has a tendency to thin out the grass. If, however, sand is mixed with loam and a small percentage of well-rotted manure is added to the mixture and spread on the green at the rate of approximately 1 cubic yard to 3,000 or possibly as high as 5,000 square feet of surface, excellent results will follow. This top-dressing should be applied three or four times a year during the growing season. As for an implement that will break up the surface of the green, we would not recommend this procedure, as our experience advises against it. While turf may survive such treatment, it is rarely benefited by it.

4. SPRING ROLLING OF PUTTING GREENS; VALUE OF TANKAGE AS A FERTILIZER.—We have just gone through a very bad winter and the ground is anything but even, due to the severe cold and warm spells we have had. Is it advisable to roll the greens and fairways? Also has tankage any value as a fertilizer for putting greens? (Ohio.)

ANSWER.—Practically every golf course needs a rolling each spring after the frost is out of the ground. The effect of the freezing and thawing is to heave the soil and leave it very soft. On sandy soils the rolling can be as heavy as one desires. On clay soils some discretion must be used. Do not roll until the top soil is fairly well drained; that is, do not roll it while it is wet and soggy. If the soil of your putting greens is rather clayey in nature, top-dressing with sand is the proper thing, using thin coats at frequent intervals rather than a heavy coat at one application. Tankage is a good fertilizer for putting greens. In general, however, we

advise that the fertilizing of putting greens, for quick results, be accomplished by using ammonium sulfate at the rate of 3 to 5 pounds per 1,000 square feet, in conjunction with top-dressings of good compost. Compost and ammonium sulfate seem to be absolutely reliable in keeping up the turf of putting greens.

5. PIPING GREENS AND FAIRWAYS.—Have you any information or suggestions to offer in connection with piping greens and fairways for water? (Washington.)

ANSWER.—This is a broad subject, but if suggestions in brief would be of value to you we believe that for watering fairways a system of pipes of at least 6 inches in size and capacity of 500 or 600 gallons a minute would be necessary. This would, of course, entail a rather large expense. For greens alone you could probably arrange with 2-inch pipe and 1-inch laterals. If you have a city water system convenient we would advise you to connect with it in case you can make a fair rate for the water to be supplied. Golf pipes need not be laid at a great depth, but can be placed just below the surface, which saves considerable money. They must, however, be so arranged that, through the use of valves at the low levels, all the water can be drained out in the late fall and the pipes left dry so that they will not burst in freezing weather. You should have at least 20 pounds of pressure in order to make your sprinklers operate properly; 30 pounds would be better.

6. FERTILIZING A CREEPING BENT NURSERY TO HASTEN THE DEVELOPMENT OF STOLONS.—We have a 110-foot nursery row of creeping bent and would like to know what we can do to push the growth of it in the spring so as to get stolons for planting greens in May or June. We can obtain here a very fine bone dust and dried blood fertilizer. Would these be effective, or would you advise the use of a chemical fertilizer? (Alberta.)

ANSWER.—The chemical fertilizers, such as ammonium sulfate and sodium nitrate, produce quicker results than the organic fertilizers, such as bone meal and dried blood. The chemical fertilizers, however, are apt to scorch the grass, but you should have no trouble in this respect if you apply them mixed with compost and then water the application in well. The danger from burning is greater in hot weather than in the spring or fall. We would advise you to use  $\frac{1}{3}$  pound of ammonium sulfate or sodium nitrate to your nursery row of 110 feet, this being at the rate of about 3 pounds to 1,000 square feet of surface. As for bone dust or dried blood, these may be applied without risk of burning. They are good fertilizers, and particularly the latter, which is much quicker in action than is bone dust. Seven to 10 pounds of bone meal, and a somewhat less quantity of dried blood, may be applied to 1,000 square feet of surface with good results.

7. SPRING SEEDING VERSUS FALL SEEDING.—Can we seed our greens this spring and have them ready for play by June 15? (Illinois.)

ANSWER.—In our opinion, it is out of the question to accomplish this result. Late summer seeding is infinitely better than spring seeding in your latitude, and it is unfortunate that you did not get your course seeded last fall. However, it is probably worth while for you to go ahead and seed your greens just as early as possible this spring, as by fertilizing, or preferably top-dressing, and careful attention to watering through the sum-

mer, you ought to secure a good turf by fall. The great trouble with spring seeding is that the young grass is unable to withstand the vigorous onset of weeds. Turf from seed sown in the fall is not subject to the invasion of weeds until the following spring, by which time the young turf is sufficiently vigorous to compete with the weeds.

8. VALUE OF DRAGGING OR HARROWING; TREATING THIN FAIRWAY TURF.—Our fairways are not as smooth as we would like to have them and the grass is more or less in spots or tufts. We were thinking of going over the fairways with a drag or harrow and then rolling. Do you think this is advisable, or will the drag injure the grass? (Minnesota.)

ANSWER.—We doubt that the use of a drag or harrow will improve your thin turf. We would advise you to fertilize your fairways with bone meal applied at the rate of 500 to 600 pounds per acre. Still better results could be expected from applications of well-rotted manure, but the presence of this material is often objectionable, from the players' standpoint, especially in the spring. In addition to these organic fertilizers, we would recommend the application of ammonium sulfate at the rate of 3 pounds to 1,000 square feet, to the thin spots. Rolling the fairways is essential before play begins in the spring, as the action of frost during the winter leaves the surface uneven. The fairways should be rolled when the ground is moist enough to respond to rolling but not so wet that it will pack.

9. SODDING IN SPRING.—Our 17th hole is only about 120 yards long and the green is so large that we have decided to reduce its size. Its turf is excellent. Our 8th green is poor and has never been in a thriving condition, and we have decided to tear it up and rebuild it the first thing in the spring. It has been our intention to seed it, but we are wondering whether there would be any objection to sodding it with turf we remove from No. 17 green. (Ontario.)

ANSWER.—It is perfectly satisfactory to lift and replace putting turf in the spring. We would suggest that the work be done as early as possible. If the work is well done, the returfed green can be played on a very few days after it has been sodded.

10. UNSUITABILITY OF AGRICULTURAL GYPSUM FOR USE ON GOLF TURF.—Agricultural gypsum is recommended to us as a soil fertilizer, as an agency to lighten clay soils and make sandy soils firm, and as a deterrent for earthworms. Have you any information on the value of the material for such purposes? (Illinois.)

ANSWER.—Gypsum is valuable for the production of certain farm crops, particularly red clover, on certain soils at least. We do not favor its use on golf courses, because it encourages white clover, which is regarded as undesirable. It has a tendency to create an alkaline condition of the soil, whereas on putting greens particularly an acid soil is preferable for the bent grasses, since such soil is unfavorable to white clover, crab grass, and many other weeds. We do not advise the use of gypsum on any part of the golf course.

11. CONVERTING REDTOP AND FESCUE GREENS INTO BENT GREENS.—We are desirous of converting our fescue-redtop greens into bent greens. Can this be done this spring by the use of seed or stolons of bent without reconstructing the greens? (Iowa.)

ANSWER.—A green of any kind can be converted into a bent green by sowing German mixed bent seed on top of the old turf at the rate of 3 to 4 pounds per 1,000 square feet, and then lightly top-dressing. September is the best time of the year to do this, but inasmuch as the expense is not great it may be well to try it in the spring, seeding just as soon as the frost is out of the ground. The same results can be obtained by scattering stolons of creeping bent on the old turf and then top-dressing. For success with this method, however, the green should be put out of play for a few weeks until the stolon joints become rooted. Late summer is likewise the best time to do this work.

12. RELATION OF BUNKERING AND SIZE OF PUTTING GREEN TO LENGTH OF HOLE.—As very few of our members had learned to play golf before the organizing of our club, we were advised to lay out our course for the first year without bunkers or traps, so as to learn to hit the ball and get direction without being handicapped. It is our purpose now to construct bunkers on the course. The lengths of our holes are as follows, and it will be appreciated if some suggestions can be given us as to the character of bunkering suitable for the respective holes: Hole No. 8, 178 yards; holes Nos. 1, 3, 5, 6, 7, and 9, 268 to 333 yards each; hole No. 4, 368 yards; hole No. 2, 403 yards. (Washington.)

ANSWER.—Your hole No. 8 is a full midiron hole, and your holes Nos. 4 and 2 are practically drive and midiron holes. On all three of these holes the greens should measure 7,000 to 8,000 square feet. A bunker should be placed to the right and left of each green, so as to permit of a running-up shot and penalize either a hook or a slice. Your other holes are all of the drive-and-pitch type. With holes of this type the putting greens should measure between 4,000 and 6,000 square feet. Such greens are usually severely bunkered, being practically surrounded by bunkers. Certainly with all holes of this type you should have a bunker running across the front of the green, so that the hole should be played by a pitch shot and not by a running-up shot. In this way, what you virtually have is a mashie hole plus a drive.

13. SOUTHERN LIMIT FOR CREEPING BENT GREENS; SEED MIXTURE FOR FAIRWAYS.—We should like to know whether in your opinion creeping bent stolons would be suitable for putting greens in this locality, also whether Chewings' fescue would make a desirable fairway turf. (North Carolina.)

ANSWER.—The altitude of your particular locality in North Carolina would place it just within the southern limit for creeping bent greens. Were it not for your altitude, we would not be inclined to advise you to try creeping bent. We do not regard Chewings' fescue as suitable for either fairways or greens in your region. For your fairways we would advise you to use a mixture of 4 pounds Kentucky bluegrass and 1 pound redtop, seeded at the rate of 150 pounds per acre.

## Meditations of a Peripatetic Golfer

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Merit will always win in the end. The organization of local green sections will inevitably eliminate the dealer or the expert who does not render high-grade service.

Perhaps the most trying test of skill in golf is the long high shot of about 180 yards. Every golf course should have a 1-shot and a 2-shot hole calling for this type of play.

If you are going to plant vegetative greens, be sure to use a pedigreed strain that has a good record.

Putting greens covered with solid sheets of ice. Let them alone! Otherwise you will do more harm than good.

The point is not that the Green Section objects to red fescue—but that red fescue does not like America, except in a few spots.

“Grow,” “green,” and “grass” all come from the same original Anglo-Saxon word. So a greenkeeper is one who makes grass grow green.

Undulations that are too high or too steep get crowned by the mower. If they are too high, the turf on top is rarely good. Make them low and sweeping.

It is all right to be an individualist. But do not carry it so far as to do everything differently from the other fellows—especially in greenkeeping.

If you are a booster for the Green Section, show it by getting at least one new member club! We need the clubs, and we are sure they need us!