J. F. CORNMAN

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of the

UNITED STATES GOLF ASSOCIATION GREEN SECTION

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William F. Brooks

By H. C. Mackall

The sudden death of Senator William F. Brooks, of Minneapolis, on the 19th day of March, marked the passing of one of the most prominent and active men in golfing circles in the Northwest. For years golf in all its aspects, and particularly as to the work of the Green Section, had been the hobby of Mr. Brooks, and it was fortunate indeed for the game that he was was able to indulge in this hobby as he was wont.

He had been actively identified, however, with all of the largest golf organizations of the United States at one time or another. He had been a Vice-President and Director of the Western Golf Association; he had been the President and a Director of the Trans-Mississippi Golf Association; he had been President and Director of the Minnesota State Golf Association; he had been the Chairman of the Northwest Section of the Greens Association before it had been absorbed by the United States Golf Association, and since its absorption, he had been a member of the Green Section Committee; and he was a member of the Senior Golfers' Association of the United States, being the first man from Minnesota to be so honored.

It is in connection with the Minikahda Club and the National Amateur Tournament held there last year that Senator Brooks became best known to golfers all over the United States. By reason of his personality and activity the United States Golf Association's Executive Committee had awarded this tournament as far west as Minneapolis for the first time in the history of the Association. Mr. Brooks was made General Chairman of the Tournament Committee for the Minikahda Club. If unsolicited statements of those who have attended these tournaments may be taken as a fair criterion, the success of this tournament, as reflected in the smoothness of its operation, was in some respects the most successful tournament of its kind the United States Golf Association has held, and this success is attributable to the work of Mr. Brooks.

Although a man of large affairs, Senator Brooks, in addition to his golfing activities, was interested in the political activities of his party, and at the time of his death represented his district in the State Senate and was the Minnesota member of the Republican National Committee.

For years the Minikahda Club and "Bill" Brooks were inseparably connected in thought and in fact. He was the only man for whom the club ever put aside its tradition that no one should be returned to its presidency, and honored both itself and Mr. Brooks in electing him President in 1921 when he had formerly served in that capacity in 1906. It was the greatest recognition a club could give a man, who

WILLIAM F. BROOKS

over a period of 22 years had made the club an object of his affection and devotion.

To him golf was more than a game or a fleeting pastime. He appreciated the game in its finer aspects, knew it to be an opportunity for the close comradeship of the links, realized that the spirit of the rule was more often to be observed than the letter, and he believed that the honor of the game was not limited to the first shot at each tee, but extended from the first tee to the last hole. In his passing the game has lost one of its real leaders.

Appointment of Dr. John Montieth, Jr.

We are pleased to announce that Dr. John Montieth, Jr., who is well known to readers of THE BULLETIN as a result of his excellent work on turf grass diseases, has recently been employed by the United States Golf Association Green Section. He entered upon his new duties on April 1, and is to have charge of the research work. Dr. Monteith's past training and experience and his interest in turf grass problems fit him admirably for these investigations, and we confidently look forward to accomplishments that will be of great value to golf courses.

Effects of Individual Fertilizer Materials on Soil Reaction

By O. J. Noer, Madison, Wis.

Individual fertilizer materials affect soil reaction differently, some intensify and others reduce the acidity. In any program designed to modify soil reaction these specific effects must be considered.

The soluble acids dissolved in the soil water produce marked effects on vegetation, and the development of this acidity depends upon the presence in the soil of insoluble acids. It is the minute clay particles which become acid in character. In non-acid soils the clay is saturated with calcium, but additional calcium may be present in the form of lime carbonate. Until all the lime carbonate and appreciable amounts of the calcium saturating the clay are removed, soluble acidity will not develop. In humid regions the percolating waters, as they pass down through the soil, leach out calcium and the residual clay particles eventually become acid. Fortunately those materials which cause acidity accelerate the removal of calcium and thus hasten development of insoluble acids, the reservoir from which soluble acids are formed.

The insoluble clay is a complex salt exhibiting acid properties when its basic calcium is removed. Mineral fertilizers are also salts, containing an acidic and basic portion, and are usually water soluble. Those capable of yielding soluble acids contain a basic portion which the insoluble acid clay can absorb, leaving the soluble acid dissolved in the soil water. The basic material absorbed by the clay reduces its acid producing power, but re-solution usually takes place, especially if the basic portion is ammonia or potassium and leaves the clay unimpaired in acid properties.

The organic fertilizers have little effect on soil reaction until broken down into simpler substances by the soil micro-organisms, and any changes that do occur are therefore secondary, resulting

from the interaction of these simpler materials with the soil constituents.

Acid soils contain iron and aluminum in combination (basic salts, hydroxides or oxides) capable of forming insoluble compounds with phosphoric acid, and thus nullify any effect the phosphoric acid might have on soil reaction.

The action of individual fertilizers is based on the above principles. Fertilizers are grouped according to the predominating plant food constituent, and may be further subdivided depending upon the chemical nature of the plant food element. In the main, members of each sub-group exert similar effects on soil reaction, differing only in degree.

The Nitrogenous Fertilizers

Fertilizer nitrogen exists in three main forms, either as ammonia, organic, or nitrate nitrogen. The ammonia fertilizers increase acidity, the organic carriers produce the same effects if free from basic materials, and the nitrates decrease acidity. The mechanism whereby these changes take place are best discussed for each important material.

Ammonium sulfate.—This fertilizer is the peer of all so far as increasing acidity is concerned. When applied to a soil already acid the ammonia is first taken up by the acid clay and sulfuric acid remains in solution. If the acid clay still contains calcium capable of being released it dissolves and then unites with the free sulfuric acid to form calcium sulfate (gypsum), a soluble, neutral salt which leaches out in the drainage waters. This leaves the clay more acid. The absorbed ammonia is gradually converted to nitric acid by soil micro-organisms, and either increases the soluble acidity or combines with more calcium. The net result is to markedly increase the acidity of the insoluble clay, and eventually a condition is reached where the clay becomes exhausted of all replaceable calcium. The peculiar effectiveness of ammonium sulfate results from the combined effect of the nitric and sulfuric acids.

Sulfate of ammonia accelerates the removal of lime carbonate from non-acid soil, calcium sulfate being formed and subsequently washed out in the drainage waters.

Ammonium phosphate.—This fertilizer increases soil acidity but is not as effective as sulfate of ammonia, because the phosphoric acid is precipitated in the soil as insoluble phosphate. If the soil is acid iron or aluminum phosphate is formed and in non-acid soil calcium phosphate is precipitated. Thus the sole effect on soil reaction depends upon the nitric acid formed from the ammonia by the soil organisms.

Organic nitrogen fertilizers.—The effect on soil reaction depends upon the nitrogen content and the amount of extraneous basic materials. In the soil the organic nitrogen is ultimately converted into nitric acid by the soil organisms, and this tends to make the soil acid. Naturally the effect is most pronounced with those materials having a high nitrogen content, such as dried blood, and least with materials of low nitrogen content, such as the animal manures. Any basic substances are finally converted into carbonates which have alkaline properties. This occurs to the lime contained in manure, and if the amount is sufficient this lime may overcome the acid producing power

of the nitric acid formed from the nitrogen. Bone meal and tankage usually contain sufficient lime to overshadow the nitrogen. It is doubtful if organic fertilizers ever markedly increase acidity.

Urea is usually classed as an organic fertilizer. Unlike the majority of organic materials it is completely water soluble. Plants are said to be able to take up urea direct, and where this occurs there can be no change in soil reaction. However, the nitrogen of urea is easily transformed to ammonia in the soil, and this in turn to nitric acid, so the tendency is to increase soil acidity whenever the urea is not taken up direct.

Nitrate fertilizers.—There are two nitrate fertilizers on the market, namely, nitrate of soda and calcium nitrate. They differ solely in the basic portion of the salt. In nitrate of soda the element sodium is the base, and in calcium nitrate it is calcium. Nitrate of soda is refined from natural deposits in Chile, and calcium nitrate is produced synthetically in Germany. Both materials tend to decrease soil acidity. Nitrate nitrogen is the form preferred by most plants, and when the nitrogen is taken up the basic portion, either sodium or calcium, remains and combines with the insoluble acid clay, thus neutralizing some of its acid and reducing its power to liberate soluble acids.

Phosphatic Fertilizers

There are three principle sources of phosphoric acid, namely acid phosphate, ammonium phosphate and bone meal. While other materials frequently contain some phosphoric acid, they are usually used primarily to supply other plant food elements. Excepting ammonium phosphate, they all reduce soil acidity.

Acid phosphate.—This is the most widely used source of phosphoric acid. The name refers to the process of manufacture and not its effect upon soil reaction. It is produced by treating raw rock phosphate, mined in Florida, Tennessee and the Carolinas, with sulfuric acid. This converts the insoluble calcium phosphate into a soluble phosphate. A portion of the calcium from the original rock is converted into calcium sulfate, a neutral salt, and the resulting soluble phosphate contains less calcium per unit of phosphoric acid than the original rock. When applied to the soil acid phosphate tends to make the soil less acid. On acid soils the phosphoric acid combines with iron and aluminum to form insoluble phosphates, and the calcium is released in a form capable of uniting with the acid clay and reducing its acid properties. The effect is slight since the amounts of phosphate ordinarily used are small, so for all practical purposes the reduction is slight.

Ammonium phosphate.—As explained above, the effect on soil reaction is due solely to the nitrogen, since the phosphoric acid is precipitated in the soil as an insoluble phosphate and thus removed from the soil solution. Ammonium phosphate is less effective than ammonium sulfate in increasing soil acidity.

Bone meal.—There are two principle grades of bone meal, steamed and raw bone. The steamed meal contains about 2½ per cent nitrogen and 27 per cent phosphoric acid, while the raw bone contains approximately 4 per cent nitrogen and a little more than 20 per cent phosphoric acid. Besides the insoluble calcium phosphate, bone also

contains some lime carbonate. As soil processes convert the insoluble calcium to soluble phosphate, a portion of the calcium is released as lime carbonate, which with the lime carbonate naturally in the bone, reduces soil acidity by reacting with the acid clay.

Basic slag.—This is a commonly used phosphatic fertilizer in Europe but is rarely used in America. It contains free lime carbonate, and insoluble calcium phosphate, and hence reduces soil acidity.

Potash Fertilizers

The potash-containing fertilizers are imported from Germany and France. Muriate and sulfate of potash are the common carriers, both water soluble and containing 50 per cent potash. They are salts, the potash being the basic portion and muriatic (hydrochloric) or sulfuric acid constitute the acid portion. When applied to the soil they increase soluble acidity. The basic potash is taken up and held by the acid clay and the acid, either muriatic or sulfuric, remains in the soil solution. While the absorbed potash reduces the acid producing power of the clay, as soluble potash is withdrawn from the soil solution by the grass roots the absorbed potash gradually dissolves and the acid producing power of the clay is slowly restored.

Soil Amendments

These are substances added to the soil, not primarily as sources of plant food, but to modify soil reaction or physical soil conditions. Three materials, namely, lime, gypsum and sulfur, deserve consideration.

Lime.—Agricultural lime is commonly crushed limestone or lime carbonate, although hydrated lime or quick lime are occasionally used. When limestone is burned in a kiln, carbon dioxide escapes and quick lime is formed. Hydrated lime results when quick lime "slacks" with water. Approximately 56 pounds quick lime and 74 pounds hydrated lime are equivalent in neutralizing power to 100 pounds crushed limestone.

When any of the above forms of lime are applied to acid soils, marked reduction of acidity takes place. Hydrated and quick lime due to their greater solubility act much more quickly than the insoluble crushed limestone. The lime supplies basic calcium which completely neutralizes the soluble and insoluble acids if applications are sufficiently heavy. The by-products of the neutralizing action are water in the case of hydrated and quick lime, and carbonic acid (carbon dioxide) with the crushed limestone. Carbonic acid is a gas which escapes into the air and since water is neutral the net result is marked decrease in soil acidity.

Gypsum.—In times past gypsum was commonly used by agriculturists, but is now rarely applied to soils. Gypsum, also known as calcium sulfate, is a neutral salt consisting of calcium combined with sulfuric acid. When applied to very acid soils the first effect should be to increase soluble acidity. The acid clay absorbs the calcium and leaves the sulfuric acid dissolved in the soil water. If the gypsum applications are heavy, after the soluble acid leaches out in the drainage waters, the clay gradually releases calcium to the soil water and soluble acidity is reduced until marked removal of calcium takes place. Gypsum is sometimes used in attempts to flocculate heavy clay soils.

Sulfur.—There are specific micro-organisms in the soil capable of converting sulfur into sulfuric acid. The presence of air to supply oxygen and moisture are essential. Sulfur in limited amounts, mixed with topdressing, should promote soil acidity, and its use may prove valuable in regions where conditions make it difficult to create acidity by the sole use of acid-producing fertilizers.

In the next article the possibilities of introducing lime and other basic substances in sand, and in other materials, in quantities sufficient to overcome the acid-producing powers of the fertilizers, will be discussed, and the lime content of a few typical sands from some localities will be included.

The Service Rendered by the United States Golf Association Green Section to the Golfers of America *

By William C. McKnight, President, Baltusrol Golf Club, Short Hills, N. J.

When I was asked to make a few remarks to you today and was told of the topic it created great surprise in me. I could not conceive why, from my own standpoint, and holding the opinion that I do with respect to the work of the Green Section, there could be the slightest doubt in the mind of anybody with respect to that Section and the splendid work that has been done by it. But it is often well to look back over work in a retrospective attitude and to take stock.

This is an age of experts and an age of very intensive scientific searching for facts. You all have in mind notable instances of that, but I may remind you of the research laboratory of the General Motors Company. It is very extensive. It is doing an enormous work. It is probably more directly responsible for the vast improvements in structure and operation of automotive engines and automobiles than any work that is going on in the country today. The research laboratory of the General Electric Company is vast, and its work is directly responsible for most of the modern improvements in electric devices. (The most notable instance, I suppose, with which you are all familiar is the development of the metal filament lamps which were perfected in the research laboratory of the General Electric Company.) The Bureau of Standards at Washington is doing a most gratifying work, the benefits of which are widespread throughout the entire country. I have no doubt that it was due to knowledge of such facts that Mr. Whitney and his associates in the management of the United States Golf Association in 1921 conceived and organized the Green Section. In his annual address in 1922, I learn from the reports that he stated to the meeting with respect to the Green Section: "Its object is to form a central distributing station in order to gather and send out to the golf clubs in the United States information of value relative to the upkeep and preservation of the finer grasses; also to advise the green committees of the golf clubs in this country on all matters that will be of benefit to them and thereby save a great deal of the money that has hitherto been wasted through lack of proper information."

That was very prophetic of what has happened. It was their idea to establish for golf a great research laboratory and to dissemi-

*Address given at annual meeting of the United States Golf Association Green Section at New York City, January 6, 1928.

nate to all of the golf clubs of the country all the knowledge gained by the workers in the Green Section.

As I look upon the work of the Green Section, it seems to me that there are three notable successes. Of course, the first is the research laboratory, as I may call it, in Washington, where this devoted band of men are working all together, as Mr. Westover has told us, carrying on all these experiments and searching out scientific facts for our benefit.

The second is THE BULLETIN, which disseminates not only the knowledge gained there, but the knowledge and experience which we have gained from our own direct contact with the work.

The third, to my mind, is the exposure of a great many false ideas that we all had in the early days when there was no source of information with respect to greenkeeping. These are really notable successes.

Just a word as to some personal experiences. When I had the work of the green committee wished on me I suppose I had about as much knowledge of greenkeeping as a new-born babe, which is nil. I was somewhat flabbergasted, and I sought for information. The first thing I found was that very good book of Dr. Piper and Dr. Oakley, "Turf for Golf Courses." I purchased two of those books, one of which I gave to our professional, and one of which I studied. From that work I acquired a good deal of information. Then, fortunately, came THE BULLETIN, which was taken in triplicate by our club. It has been and still constitutes our bible. Last year, when I had occasion to advise a golf club with respect to some troubles they were having, I thought I would get hold of the greenkeeper and have a talk with him. I found that he was an excellent man in many ways, but he was one of the old-fashioned fellows without any very great knowledge about grasses or the diseases of grasses. I turned to him and said, "I suppose you read THE BULLETIN." He said, "Ah! that is bunk; that is all theory." Fortunately, that attitude has very largely gone by. I think there is some of it yet, but a man who holds that view today soon passes out; and he passed out.

Another experience: George Low and I were having an accumulation of troubles four or five years ago at Baltusrol. We had brown-patch very badly in our greens, with weeds and grubs in our fairways, and if anything can break the heart of a greenkeeper it is to get all of these things at once. We were both much discouraged and we talked about various things. George said to me, "Mr. McKnight, this greenkeeper's work is a terrible job. You not only have to have knowledge of grasses and all fertilizers, but you have got to be a mechanical engineer and a chemist." That lament, I think, was quite prevalent for a while.

One other experience which we have had at Baltusrol concerns velvet bent, and we look upon it as rather an interesting experiment. Three or four years ago we thought it might be possible to propagate velvet bent vegetatively. So far as we knew it had not been done and we had no facts to go upon, but we tried it. We were fortunate in having a good deal of velvet bent through our fairways. Major Jones gathered up all he could get, which we planted in the nurseries. The next year we had very gratifying success with it. It spread quite prolifically, and we now have two greens in our upper course which have been established with velvet bent from the nurseries and which

are very good at the present time. The grass is very promising, certainly in the northern belt, where velvet bent thrives. I personally like velvet bent very much better than creeping bent. The color is more pleasing and I think the texture is very much better for putting surface.

Here is a practical illustration of the worth of THE BULLETIN to all of us. Major Jones wrote an article, which was published in the August number, giving his experience with the propagation of velvet bent stolons; in the September number a man from Massachusetts wrote that he had tried the same experiment with gratifying success; and in the October number there was another instance of the same thing. There is your value of THE BULLETIN in disseminating knowledge. There were three men, working independently without any knowledge of each other's work, all to the same purpose, and through the dissemination of such knowledge all of us are benefited. The growth of this Section is exceedingly gratifying.

I am informed that in 1921 there were 287 members of the Green Section. Today there are about 1,000. This idea has spread to Canada and England. So, gentlemen, to Mr. Whitney and his associates whose wisdom and vision conceived and organized this section; to Dr. Piper and Dr. Oakley, whose driving force and initiative and work brought this child up to lusty manhood; and to this band of devoted workers, of whom Mr. Westover is one in Washington, who are carrying on this work, every golf club in this country, every golfer in this country, and every green chairman and all greenkeepers owe a profound debt of gratitude.

How the Green Section Can be Helped by Clubs, Green Committee Chairman and Greenkeepers*

By Sherrill Sherman, Yahnundasis Golf Club, Utica, N. Y.

I just want to break in a little on my prepared talk to bear testimony, in addition to Mr. McKnight's, to the success we have had at Utica in the use of velvet bent on our greens from the vegative method. In 1922 we did as Mr. McKnight did—we went out in the fairgreen and picked the best looking pieces that we could find. Sometimes the men were not as careful as they might have been, with the result that we had some splendid patches of fescue which did not do much spreading. The velvet bent spread and produced beautiful turf, and I quite agree with Mr. McKnight that THE BULLETIN disseminated that knowledge following the article of Mr. Jones. That is why I am taking this opportunity to bear the testimony of Utica that it is possible to produce turf from velvet bent by the vegetative method.

In thinking over the subjects that I might be able to discuss in an intelligible manner, it occurred to me that the picture has shown too much of the help that the Green Section is giving to all of us and that we had lost sight somewhat of the importance of the assistance that we can give the Green Section. After hearing the splendid address showing clearly the completeness of the service rendered by the Green Section, I am more than pleased that my choice of a subject

*Address given at annual meeting of the United States Golf Association Green Section at New York City, January 6, 1928.

will show, I hope, how we can properly repay the Green Section for the results accomplished for the golf clubs of this country.

I realize that I will undoubtedly bring nothing new or startling to your attention, but it has always taken much repetition to make even the most obvious truth accepted. I will hope that by giving some suggestions I can bring them to your attention forcibly enough to accomplish something. All suggestions will not fit all persons, but surely we can, at least in some way, put our shoulders to the wheel and give a push that will keep our "band wagon of greenkeeping progress" rolling steadily forward without any stops or even hesitation in its continued advance for our own good. I speak of our own good as it relates to golf and greenkeeping. This fine attendance this morning is concrete evidence that we have an interest in other things concerning golf beside playing the game. Golf, with its great capital investment and all its ramifications, has truly become a big business and so we must give the best in us for its advancement and for the adequate support of our leaders.

Today we meet especially to hear and consider these problems and their solutions applying to the physical upkeep of our grounds, how better methods can be used, how to avoid mistakes, and to learn how much can be accomplished by cooperation. Having at times been tempted to allow my pen to run away with itself and so appear in print, I have been really surprised how widespread the interest is in our problems as shown by the far-distant localities from which I have received letters of comment.

What support does the Green Section want or expect from its followers? The answer is short and two words tell the whole story—money and interest. We all know that it takes money to give us working material with which to work out our ideas, and many an inventor has sold a large share in his invention to obtain the funds to continue his experimental work to a final triumph. Do not get worried when I speak of money, for there is to be no personal appeal or touch on my part, but at your leisure I hope those who are here in person and those readers of THE BULLETIN who are absent will take these suggestions to heart and let the Green Section profit thereby.

When Mr. Westover so kindly asked me to speak at the annual meeting of the Green Section it occurred to me that, being a member of the Advisory Committee, I might speak more freely in asking for help than the modesty of those in active control would allow. It was for this reason that I chose my subject. As you may well surmise, it will not be technical or filled with practical hints for easier or better greenkeeping, but you will agree that full support by all, to the extent of our abilities, will enable the Green Section to accomplish much more.

Our problem, if problem it can be called, should be viewed comprehensively as a whole and then divided into its constituent parts. I shall therefore take as the first heading "What Are the Needs of the Green Section?" and give as an answer "Money and Interest"; and for the second heading, "Helps, What, When and How?" If I am able in a clear and simple way to list our possible methods of helping the Green Section, and if by so doing each one of those present as well as the absent readers of THE BULLETIN are enabled to assist in a way which would not burden the individual or club, then I shall feel that I have been of help, if only in a small way.

To digress a moment from my subject, I desire to mention Dr. Piper and his value, especially to THE BULLETIN, and it is said with no thought of invidious comparison, but he certainly had the knack of being able to get adequate contributions to THE BULLETIN. If we desire more articles of interest, and if we comment because of what may appear to us as their scarcity as we read THE BULLETIN monthly, the blame comes back primarily upon ourselves, for we, with our large numbers, voluntarily should send in contributions to keep the editors busy editing rather than pleading with us to do our part for the success of THE BULLETIN.

Just think how interesting it would be if every person who attended the summer convention at Washington had written his personal impression of the work being carried on there and of the meeting, of course with the thought that the editorial shears be allowed full sway in putting such letters into proper shape for publishing in THE BULLETIN, emphasizing the high points of each communication.

I might say that the greens at the Garden City Golf Club in 1908, by their splendidness at a time when good greens were decidedly the exception, aroused in me an interest in the greenkeeping side of golf that has continued unabated. That year I returned to Utica with the desire that our greens should be improved so that they would approach the Garden City standard, and I believe that I can truthfully say, from the favorable comment that has been expressed by the rank and file of golfers, as well as those especially equipped with knowledge, both amateur and professional, that this hope has been quite well realized. And what a help in those days would the present Green Section have been to us who were out of touch, except occasionally, with the better things in greenkeeping.

Since through the clubs must come primarily the answer to the first part of our Green Section problem of needed help, that of adequate financial support, so from the green committee chairmen and the greenkeepers must come the needed interest. With our work thus divided it is now proper to proceed to show how each can do his part.

In view of the fact that the Green Section was established for the direct benefit of the golf clubs of the United States, whether members of the United States Golf Association or not, the least that the clubs themselves can do, with their individual members and the clubs' greenkeeping organizations, is to give their whole-hearted support The Green Section has no axe to grind nor individual product to boost, but is interested solely in the good that can be accomplished for the benefit of the clubs. In words that perhaps are somewhat slangy, take the position of being a "booster." We are not all fitted with scientific minds, but we have eyes and should with a little care note anything new or out of the ordinary. Unquestionably some of the greatest advances of civilization have come from chance remarks or observations which have been developed by those of scientific or inventive minds. Since the Green Section was organized, the great wisdom of combining science with practical work in the field has yearly become more clearly demonstrated.

As a practical matter of dollars and time, it is not possible for the scientists of the Green Section to personally observe everything at the different clubs. Trained men are not available, nor have the

funds been sufficient to finance all such trips. When visiting another club, check things over and give, if you can, any helpful suggestions in a friendly manner, for even friendly criticism sometimes seems like stepping on one's toes, and the pleasanter the manner the more likely such suggestions will be gladly received. As is likely, if the knowledge that you are passing along came from the Green Section, be sure to give the Green Section credit, for the Green Section is really but a reservoir of knowledge which we all have helped to fill. Since none of our golf courses are perfect or perfectly cared for, sometimes a quite evident fault to an outsider is passed by daily by our organization. Since local conditions may be such that the same results cannot be obtained as at your home course, be not too sure of yourself in expressing an opinion. As I look back at some years of greenkeeping experience, with possibly a local favorable reputation in accomplishing results, I am greatly impressed with this fact—that nature made things easy for me and that many others, much more efficient, have not obtained due credit because the natural conditions under which they are working are extremely difficult. As we visit the different clubs and converse open-mindedly about our mutual problems, surely a feeling of friendly neighborhoodness will be created which cannot help but result to the good of our guiding force, the Green Section.

Now, as the saying is, "let's get down to brass tacks" and see just what is the help that can best be given by each of us to the Green Section. I shall first enumerate with possibly a few words of comment what the clubs can and should do.

First, every golf or country club in the United States should belong to the Green Section, and I believe that no matter how small the income or green expenditure, the item of dues to the United States Golf Association is one thing that should be included in every budget. No matter how small the yearly expense for upkeep or how simple the problems to be solved, the Green Section Bulletin or its officials can save a club money. Therefore, as a club becomes a member it should exert every effort to induce other clubs with which it comes in contact to join. This effort for increased membership in the Green Section applies not only to individual clubs, but even more so to every district, state or greater territorial association to pledge itself to a 100 per cent membership of all clubs in its territory. If the club is so blind to its own good as to refuse to join, then get some individual member of that club to give the club a membership, which would be of more benefit to that club than any prize he might donate for club competition, and in the long run would bring to him greater thanks from the club membership.

Secondly, when clubs are financially able they should, I believe, put in their budget a contribution to the Green Section in proportion to their wealth. In doing this it would be but following the general procedure of life where the strong and able must do more than their exact share to offset the failure of certain clubs, through niggardliness or financial straits, to bear their fair share of the burden.

Thirdly, when clubs are composed of individuals of means it is perfectly proper for such individuals to make donations to the Green Section. By such support cheaper golf can be provided by spreading the knowledge of more economical upkeep, thereby making golf available to many more players. It has become a fact beyond successful

dispute or denial that of all games played or enjoyed by man or woman, none does or can give as much physical and mental benefit, over as long a period of years, as golf, and the benefit of cheaper golf applies to the cost of upkeep for both private clubs and municipal courses.

When I make this fourth suggestion I may be getting the Green Section into trouble, for I am not aware of the cost of THE BULLETIN, but if a large number of individual golfers would subscribe to it the benefit would be two-fold, by furnishing reliable information to the subscriber and by increased revenue to the Green Section. Surely a considerable increase in the circulation should be profitable in that the overhead cost per copy would be reduced materially. A large body of golfers would become conversant with proper greenkeeping methods, thus not only being in position to check on, but also to assist in the work of their green committee. Unconsciously they would help in many ways, and would form a large potential supply of at least partially informed men from whom new committee chairmen could be chosen. This should be to the advantage of the individual club, for trained men are more efficient than those that must learn as they go.

That clubs should pay for special service rendered is, I believe, self-evident and fundamentally sound. If payment were made of at least the actual expenses of the expert who comes to advise the club regarding its special troubles, a larger force of trained workers could be available. In addition to the payment of the traveling expenses I believe that at least a nominal charge should be made, the amount depending upon membership of the club. This charge should be readily and promptly paid by the benefited club. The average club, either on the course or in the clubhouse, spends foolishly or actually wastes yearly much more than the cost would likely be for such a visit.

Besides the payment of expenses and services, a further sum should be sent to the Green Section in some just proportion to the money saved by following any special advice. I question whether there is a single club in the brown-patch belt that has not saved in a single year many times the yearly cost of dues in fighting that dreaded green disease. Furthermore, by following the recommendations of the Green Section, it is now possible to keep the greens in play continuously for the benefit of the members of the club. Without this knowledge many clubs would have had greens either out of play, in an attempt to restore the turf, or else very unsatisfactory greens.

The ways suggested, I believe, show a number of reasonable methods by which golf clubs of the country can help the Green Section very effectively by largely increasing its income, without placing an undue burden on any club.

Now comes the green committee chairman's opportunity to help. No club member who is not willing to benefit by the accumulated knowledge of the Green Section should accept this most important position in a club. In other words, he should be convinced even before he assumes the responsibiilities of his duties that the usage of that knowledge is of paramount importance, the biggest thing about his new obligations. Each retiring chairman should make it his duty to see that his successor be fully informed of the intelligent help available from the Green Section. The new chairman, being con-

vinced himself of its fundamental merit, should sell the idea of the Green Section and its methods to his greenkeeper, and through the greenkeeper to the entire working force. It has been said that one can lead a horse to water but cannot make him drink, but if one were clever enough to persuade the horse he is thirsty, the drinking would follow most naturally. So if the reasonableness and necessity of following exactly a certain method was properly explained, the working force would follow directions and avoid damage. I believe that a green committee chairman is entitled to and should include in his budget as a necessary expense an amount sufficient to have his greenkeeper, and in a large club the assistant, attend all meetings within a reasonable distance of the Green Section or associate district green sections. Probably in no way can his greenkeeper benefit more than in the interchange of ideas from contact with fellow-workers and those who know and are able to explain to him the solution of his problems. I would go so far as to say that it would be but a slight return for all the time spent if the green committee chairman were also sent as the guest of his club. Having spent a number of years as Chairman of the Green Committee at the Yahnundasis Golf Club, I believe I am qualified to speak as to how much time is required if justice is done to the work. While the member does not seek for reward, unfortunately bricks seem to come his way oftener than bouquets, and the privilege of attending these meetings with expenses paid would be a graceful gesture of appreciation.

Perhaps a few of you may remember that a year ago I wrote briefly of those qualifications that should be considered in selecting a green committee chairman. A club that succeeds in getting a member with such qualifications to accept the position is fortunate indeed. It is almost needless to remark, yet I feel I should emphasize the value of such a man in furthering the work of the Green Section. He would be continuously passing on the good word about the Green Section, not only to club members and the greenkeeping organization of his own club, but also to those of other clubs with whom he comes in contact. Such efforts on his part surely would result in great good.

And now we come to the aid that can be rendered the Green Section by the greenkeepers and their force, the practical men who are on the job—one might say those who are in the front line trenches, to whom it seems as if some one of the forces of nature were always waging war against their work, as if nature delighted to be on its bad behavior. When I speak last of the help that can be given by the greenkeeping organization I by no means desire you to think I consider it the least important because mentioned last. It is of the greatest value, for it is the men actually doing the work whose keen observations mean real progress. A method, no matter how sound, can be utterly defeated if the men using it are careless or uninformed, just as without doubt improvements will be introduced by the careful observer. As we all know, conditions vary widely on practically every golf course in the country, even from hole to hole, green to green, so methods that are successful in one place may be a failure elsewhere. Here is where the greenkeeper can be of value in determining the reason for such lack of success.

The pioneer work has been done, yet there is much more to be accomplished. There are still numerous clubs and their members

who are not familiar with the new methods that are so helpful in greenkeeping. If a new green committee chairman is open-minded, progressive and intelligent, and properly informed by his predecessor, the first thing that he should do, after becoming acquainted with his organization, is to ascertain their knowledge of the Green Section. If the Green Section is unknown to the greenkeeper he should be properly informed regarding the work of the Green Section and urged to adopt methods that experiments have shown to give best results.

Greenkeepers should conduct more individual experiments in variations from the suggested standards. Because proper experiments involve much time, labor and expense, Arlington turf garden is handicapped in the number that can be undertaken there. But think how many would be under way if each greenkeeper were carrying on only six, intelligently and scientifically. Careful record should be kept, for experiments are of little value if not properly recorded and checked.

In such a way the greenkeeper can help much by careful study and observation of the success or failure under his own local conditions. If a greenkeeper would keep an old-fashioned diary, putting down in his own words and in his own way a report of the improvements that he has accomplished, or the failures, as to methods, material or workmanship, it would be of surpassing value. I know he would be surprised to find how little time it would take daily to write out the most interesting thing that had occurred in his work that day. This would soon become almost a habit and his daily entry would be made almost subconsciously and with little effort. Later on how he would enjoy reading all the interesting occurrences of the season! I can assure you that no more interesting articles could or would appear in THE BULLETIN than these self-same diary reports, be they long or short. Being actual records, naturally they would carry more weight. If a prize contest were held for the most interesting diary of a season's work, I know that there would be many competitors and the winner would be well worthy of the record.

I think that you will agree with my opening statement that I have said nothing new or startling but have endeavored to bring home to you in a simple, logical way some few facts. I realize that I have not named them all by a long shot, by which all of us can do our part according to our abilities and opportunities, returning that help to the Green Section which it has so freely and ably given us in the past and which it will be even more ready to supply in the future.

Just one thing more I desire to mention. Of all the good things that the United States Golf Association has done for the advancement of golf in the United States, nothing, in my opinion, has been of more actual benefit than its sponsoring and backing of the Green Section. To the individuals from whose brains that idea first came forth, a monument should be erected, financed by willing contributions of the golf clubs of the country. I believe there is no more fitting site than the turf garden of the Arlington Agricultural Experiment Farm, possibly copying the idea and action of the United States Golf Association in commemorating the holding of the Amateur Championship at each club by placing there an appropriate sun dial, suitably inscribed. In addition, a bronze tablet should be placed in the clubhouse of each of those thoughtful pioneers, so that all their

friends might be aware of the great service he had assisted in performing by the creation of the Green Section. I think I am safe in saying that the Green Section, by its wise advice, has been as great a financial aid to clubs in saving money to such an extent as to have kept the dues from being raised, which touches each of us personally.

It seems to me but fitting that a tribute should be given to the present Green Section leaders. If one has done good work it is but natural that he be pleased if such work is commended. And so I desire to suggest to those present that whenever you can, and with the work of the Green Section so successful I know that will be often, write commendatory letters to those responsible for the work at Washington. Every letter of encouragement is another nail in the coffin of that relentless enemy of golf—"The Devil in Charge of Greenkeeping Troubles."

New Brown-Patch Remedies

We have received a number of inquiries concerning two new fungicides * for brown-patch control which have recently been placed on the market. The active ingredients of each are bichloride of mercury and calomel. One preparation consists of one-third bichloride, and two-thirds calomel. The other contains one-sixth bichloride, one-third calomel, and one-half inert material. Since these mixtures are based on suggestions made in the November, 1927, Bulletin, we refer readers to page 214 of that number of The Bulletin for our opinion as to the possible effectiveness of these new mixtures. Many clubs will no doubt find that there are some advantages in using a prepared mixture such as one of the above but others will probably prefer to buy the chemicals separately and mix them as needed. It is necessary to mix chemicals thoroughly with compost or in water (depending on the method used in making the applications)) so these fungicides will require mixing, whether purchased separately or already combined. The preparation containing inert material is not as likely to form large lumps, as is the other mixture or the separate chemicals, so should mix somewhat more readily with compost. However, it should be remembered that this inert material does not control disease, and if a club is interested in economical buying care must be taken not to pay too much for this rather minor advantage of increased bulk due to inert material.

Summer Meeting of Greenkeepers

In the March number of THE BULLETIN it was suggested that greenkeepers express their preference as to the place and time for the summer meeting. There apparently is little choice as to the time but there is some difference of opinion as to whether the meeting should be held at Atlantic City or at Washington. We have therefore decided to compromise and arrange meetings at both places. The regular meeting will be held, as originally suggested, at Atlantic City, on June 4 and 5. For the benefit of those who have expressed a de-

* Calo-Clor and Turfcalomel.

sire to visit the Arlington Turf Garden, we are planning an informal meeting at Washington following the Atlantic City meeting. At that time we will have the numerous plots on the Turf Garden well labeled and will arrange for a complete demonstration of the experimental work in progress there. These two meetings will be independent so greenkeepers can attend either or both. Those coming from the West or South can arrange for the stop-over privilege at Washington on their through railroad tickets and so will be able to include the visit to Arlington with no additional transportation expense. The meeting at Washington will be altogether informal and will enable those who are interested in the work to discuss the experiments more thoroughly than was permitted in the brief time allotted to the Turf Garden visit last August. Many changes have been made on the Turf Garden since last summer's meeting, and we feel sure interested greenkeepers and green committee chairmen will find many experiments in progress which will fully justify the time and expense of such a visit. Plans will be given in greater detail in the May number of THE BULLETIN.

QUESTIONS AND ANSWERS

All questions sent to the Green Section 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 Section.

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. Liming fairways.—Recently we found that one-third of our fairways were sweet while the others were found slightly sour, and we were advised to use three or four tons of limestone per acre. Our fairways are not in a bad condition but the turf could be a little thicker for perfect fairways. What is your opinion concerning the use of limestone? (Illinois.)

ANSWER.—We certainly would not advise you to apply lime as a topdressing on your golf course. In some cases a limited amount of lime worked into the soil before seeding seems to be advantageous, but as a topdressing we seldom recommend its use. It has a tendency to encourage clover, which is quite objectionable on most golf courses, and ordinarily stimulates the desirable turf grasses only slightly if at all. It would be much better for you to invest your money in some fertilizer that is relatively high in nitrogen, such as cottonseed meal, Milorganite, or ammonium sulfate. We have seen some very excellent results in improving turf on fairways from the use of such fertilizers.

2. Seaside bent in Georgia.—We have been informed that the California golf courses are having considerable success in the plant-

ing of seaside bent grass on their greens. Do you think it would be worth our while to make an experiment with this grass in Georgia? (Georgia.)

ANSWER.—While we have had very little experience with seaside bent in the southeastern states, judging from the results obtained with closely related grasses we doubt that seaside bent would survive your summers satisfactorily. One of the puzzling phenomena connected with most grasses growing in temperate climates is that every one of them has a fairly definite southern limit. In the East the southern limit of bent is about the northern limit of the Cotton Belt. Curiously enough, in the drier half of the United States the bents succeed farther south than they do in the eastern part of the country. There are some very excellent seaside bent greens in Southern California, where the summer temperatures are higher than in Georgia, but the humidity conditions are entirely different. As yet we have no record of any one having been successful in making a permanent putting green of bent as far south as Georgia. While we do not care to say that it can't be grown, the chances of success are very small.

3. Tobacco stems as a fertilizer and worm killer.—We do not wish to cover our bent nursery with manure as it will bring worms and weeds. Could tobacco stems be used instead? Our regular greens are infested with worms. Would the juice from boiled tobacco stems kill worms and be of benefit to the grass? (North Carolina.)

ANSWER.—We have had no experience with tobacco juice in ridding a green of earthworms. From knowledge gained through other sources we are pretty well convinced, however, that it would not be as efficient or economical as the bichloride treatment.

4. Fertilizer to replace compost.—Will you kindly give us your opinion regarding a statement in advertising literature that golf greens can be satisfactorily maintained, and in fact, better maintained without the use of compost for topdressing? What do you think of a published statement that the use of such compost is sometimes the cause of brown-patch? (Ohio.)

ANSWER.—We always look with suspicion on any new theory on golf course maintenance when that theory is apparently prompted chiefly by the obvious motive of increasing sales. Compost, in addition to carrying plant food, serves to improve the putting surface. There is still some question as to the best amount of compost needed for maintaining good greens but there seems to be a united opinion throughout the country that some compost is necessary to maintain a good putting surface. Many greens are kept in good condition with much less than the usual rate of topdressing, but in spite of all the elaborate claims made for some fertilizers, we have yet to see a clear demonstration which could be interpreted as adequate proof that a fertilizer can entirely replace compost, especially on bent greens planted with stolons. We feel that the published statement concerning compost as the cause of brown-patch is merely "sales-talk."

AS WE FIND THEM

Sitting at a banquet table with some "turf nuts" we overheard this conversation. One green committee chairman asked, "Why is it we have all this bother with fertilizing turf in this country? They scarcely ever think of fertilizers in England and Scotland."

All turned to hear a veteran G. C. C. boldly reply: "You see it is this way." (His start showed he was also a veteran golfer with a poorly-disguised alibi habit.) "Under certain conditions plants can take up nitrogen from the air and over there grass apparently can get all the nitrogen it needs from air. In this country we have to supply the nitrogen by means of fertilizers."

The amusing part was the seriousness of both speaker and listeners.

Wires crossed somewhere! We always had a notion air was the same stuff the world 'round. Perhaps the "such a different atmosphere in the old world" we hear so much about is due to some different chemical composition.

Or did he have his botany mixed? We are told leguminous plants take up nitrogen from the air but plants of the grass family do not. Some "turf nuts" become so seriously afflicted that they recognize no other plant than grass. When one speaks of "other plants" such a deranged individual thinks the speaker is simply referring to "grass on some other course, or in some other country."

A mid-western G. C. C. remarked, "Those people who say 'commercial humus' is of little value for golf greens are all cuckoo. Why don't they come to life and learn something about topdressing? Why, that is all we use on our greens and we sure do get wonderful results. Come over and look at our pile of black humus. We use it just as it is without mixing with anything."

What crimes are committed in words! We took one hasty glance at his pile of so-called "commercial humus" and with what little eloquence we could summon, spoke thus:

"Sir, the gods of all greens and fairways are smiling upon you. There you have a pile of the very finest type of rich black prairie soil. That soil built the Middle West, it is renowned throughout the world for its fertility and general agricultural productivity. It has no peer, whether used for buffalo pasture, corn fields or golf greens. A pile such as that on every golf course in America would undoubtedly result in an average prolongation of life of G. C. Cs. of at least five years—and oh! how sweet and untroubled those added years would be! But please, sir, don't degrade it by calling it 'commercial humus.'"