"I am pleased to advise that this Association has wired to the Hon. Whit Martin, a member of the Ways and Means Committee of the House from Louisiana, as well as to Mr. William C. Fownes, Jr., joining the forces of this Association, consisting of 15 clubs with 6,000 members, in urging a repeal of the taxes on membership dues of golf and country clubs.

"We are in hearty support of this movement, and this Association stands ready to do anything that you may suggest at any time to cooperate in the action taken by your Association.

H. PAYNE BREAZEALE, *Secretary,*
Louisiana State Golf Association."

Observations on Brown-Patch Control in 1927

By John Monteith, Jr.

For the past two years separate summaries of the year's experimental work on brown-patch control at the Arlington Turf Garden and experiences on courses in various sections of the country have been published in THE BULLETIN. This plan enables one to more clearly distinguish between the strictly experimental work (which is always to be regarded as preliminary until tested more extensively under actual golf course conditions) and the results obtained in the practical application of principles worked out on the experimental plots. Last month THE BULLETIN contained a report of the 1927 experimental work. In the present article an attempt will be made to give a general summary of the year's results obtained on golf courses. Such a summary is made possible by the hearty cooperation of greenkeepers, club managers and greens committee members who have been willing to make tests on their courses and who are generous enough to pass on their experiences so that others may profit by them. The writer was fortunate this season in being able to talk over the work with a much larger number of men than he has been able to come in contact with in other years. No attempt will be made to give the names of all those who have contributed to this summary, for, since it includes the observations of so many individuals, many of whom report practically identical results, it is obviously impractical to give any fair distribution of credit.

We do not mean to infer that the chemical or method receiving most attention in this article is that most generally in use during the past season. Our intention is to stress those chemicals or methods about which there is as yet little information available. Whether it is a new method, or an old method with a new application, we realize that the progressive greenkeeper and greens chairman will be more interested in it than in those methods or chemicals already well known to every wide-awake group interested in greens maintenance.

Neither is it our intention to draw conclusions from this report nor to make any general recommendations. We frequently hear greenkeepers and greens committee members express impatience at our failure to make any general recommendation which they may follow to the letter and so prevent all brown-patch. It must be remembered, however, that the brown-patch problem is comparatively new. When one considers the relatively short time turf diseases have been under observation, as compared with the years that civilization has been struggling with human diseases, the results to date

are not altogether disheartening except to those whose expectations exceed their good judgment. A review of the experiences on a large number of golf courses will serve to indicate why general dogmatic recommendations for or against any method is apt to lead to endless argument. It also will explain why we refuse to make any definite and absolute rule for all clubs to follow.

The results of these varied observations are presented to show that there are now available several different chemicals and methods, any of which is effective in checking brown-patch. As far as we have been able to determine, there is no one who deceives himself by thinking that any one of them in any sense represents "perfection." Each has its advantages and shortcomings. All are expensive and none of them last indefinitely. Some treatments are much more costly than others and occasionally one finds something for which the cost is altogether out of proportion to the actual benefit derived. However, during the year we have not found in general usage a "cure" for brown-patch which is clearly a fraud. One of this type, which had more or less general distribution about three years ago, seems to have disappeared from the market. No two greenkeepers use exactly the same methods, nor is it likely nor desired that they ever will. By following the results obtained on a large number of courses, and the preference of the majority of greenkeepers as expressed in the increase or decrease in use of certain chemicals or methods, a club has some basis for guidance in selecting materials and equipment for the improvement of its own course.

Calomel

The reports on the results obtained in using calomel for control of brown-patch will perhaps be of greatest interest to most readers, chiefly because this is the first year the chemical has been tested under actual golf course conditions. Last year the results at the Arlington Turf Garden indicated that calomel would be a valuable chemical from the standpoint of reduced burning of grass, slightly more lasting control of disease, and relatively low cost. These results were explained in THE BULLETIN as being only of a preliminary nature and as applying chiefly to control of small brown-patch.

Since we do not have facilities for carrying on brown-patch experimental work under conditions other than those prevailing at the Arlington Turf Garden, it was suggested that clubs carry on some simple tests on their own greens, using calomel in plots adjacent to areas where the more thoroughly tested brown-patch fungicides had been used. This would enable one to make direct comparisons and to form some judgment as to their comparative values. On a few courses such experiments were conducted throughout the summer, and from these we have obtained some interesting and valuable information as to the general applicability of calomel. In the great majority of cases where it was used it was applied indiscriminately to all affected greens, or to an entire green for comparison with another green having some other treatment. This type of testing means that two different chemicals were compared under perhaps very different climatic and soil conditions. Although results from such tests may be of much value, they are not to be regarded as altogether reliable, and therefore some of the most enthusiastic as well as the most discouraging reports on calomel must be discounted.

In general, the results obtained with calomel as compared with other mercury compounds were regarded as entirely satisfactory, and proved that this chemical under widely different soil and climatic conditions will give results similar to those observed at Arlington. Those, however, who looked forward to calomel as the unfailing panacea for all the greenkeeper's brown-patch woes were foredoomed to disappointment. Many of this latter group, when they found that calomel fell short of their most exalted expectations, were ready to discard it as worthless, in spite of the fact that further questioning invariably revealed that some control had actually been observed or some flaw was to be found in their methods.

We have reports of the successful control of small brown-patch with calomel throughout practically the entire section of the country where this disease is common. Wherever tested carefully beside an equivalent amount of mercury in any other form it has invariably given as effective control of this type of brown-patch. In a number of cases the period of protection afforded by calomel was a little longer than that obtained by the other mercury fungicides, but in other cases no difference in time could be noted. Apparently there is no consistent variation in this respect due to a difference in locality.

When applied on greens where large brown-patch was still active and spreading, calomel proved to be too slow or even altogether ineffective. The consensus of opinion seems to be that calomel is effective as a preventive treatment for this type of disease, but, like the other mercury compounds, it does not afford protection for many days during certain periods of unfavorable weather conditions. At such times, when the disease breaks out suddenly and is developing rapidly in spite of all preventive measures, the greenkeeper must have a chemical which will act quickly and immediately check the disease. For this purpose it has been found that other mercury compounds, such as Semesan, Uspulun and corrosive sublimate, are much more desirable. We have reports of careful observations as to the effectiveness of calomel on several of the St. Louis courses, where large brown-patch is regarded as the most serious of all their turf pests. Colonel Goetz, who conducted some careful experimental work on the Algonquin course, near St. Louis, in reporting some of his tests, wrote of calomel: "Its action in checking active brown-patch is not so good as Uspulun or bichloride. Uspulun or bichloride will check large brown-patch instantly, whereas the brown-patch continues active some time after applying calomel." Continuing, he wrote: "As a preventive, calomel gives splendid results," and, again, "calomel is a wonderful thing in preventing small brown-patch." Referring to his tests with corrosive sublimate, he wrote: "Bichloride takes the color out of the green pretty badly for a few days, and where we use it as often as we do here it keeps the greens off color about all the time. It is possible that future experiments with bichloride will enable us to find a dose that will control brown-patch and not discolor the grass much." For control of large brown-patch he has concluded that the best chemicals available at present are Uspulun or Semesan, which are sprayed at the rate of 1 pound in 50 gallons of water to 5,000 square feet "as often as necessary, which happens to be every few days at Algonquin. This controls the large brown-patch quite effectively, and, of course, under this

method the small brown-patch never makes its appearance." Experiments on the Sunset Hill course also indicated that calomel was not as effective against large brown-patch as was Semesan. The customary treatment there is frequent spraying with Semesan. At Bellerive, Glen Echo and Normandie, also in the St. Louis district where large brown-patch is common, calomel and Uspulun have both been used with success. We have a report that at Bellerive Mr. Foulis used combination treatments of calomel with corrosive sublimate or Uspulun and obtained promising results. The calomel in the mixture was used for more prolonged protection, and the others gave the desired immediate control of large brown-patch. This is the only report we have received of the employment on golf greens of the combination treatments such as were used at Arlington this year.

Disappointment was experienced in some localities when it was found that calomel caused the turf to become discolored. At times this discoloration did not appear until several days after the chemical was applied. As has been observed for many years with other chemicals, grass is more likely to become injured during certain periods of summer than at other times, and also some strains of grass are more subject to injury than are others. The tests of the past summer, both at Arlington Turf Garden and on many golf courses, have shown that calomel, from the standpoint of discoloring turf, is by no means as "fool proof" as our preliminary tests in 1926 led us to hope. Results, nevertheless, substantiated our previous conclusions that it is least likely to cause injury of all the mercury compounds tested, when applied in amounts containing equal quantities of mercury. On most courses it has been found advisable during certain periods of summer when grass is not vigorous to reduce the quantity of Semesan or Uspulun below the common rate of 1 pound per 1,000 sq. ft. in order to reduce the danger of discoloring the turf. A similar reduction below the usual rate for calomel has been found to be necessary on many courses. In some instances injury was apparently a result of uneven distribution, due to carelessness or inexperience in handling such chemicals. In spite of the many reports of discoloring greens with calomel, we have had no authentic report of actual loss of turf due to injuries by this chemical where applied evenly and at the recommended rate.

Some difficulty was experienced by greenkeepers in handling the more finely ground grades of calomel, due to the tendency of the more finely divided particles to lump together. It was found to be a tedious task breaking all these lumps of calomel to insure an even distribution. This objection to calomel was well founded, but is one which it should be possible to easily overcome by using some other chemical as a "filler." No doubt the chemical companies interested in the sale of calomel for brown-patch control will soon have on the market a mixture which will prevent this objectionable lumping. During the year large quantities of calomel were sold to golf courses under the trade names "Calogreen" and "Turfcalomel." Both of these products are a pure grade of calomel, which is much more finely ground than is ordinary calomel. In the above discussion no attempt has been made to distinguish between the coarser grade and these more finely ground preparations. Many of the results above referred to were obtained with Calogreen or Turfcalomel rather than the ordinary calomel.

Nu-Green

Another brown-patch remedy appearing this year for the first general trial on golf courses is Nu-Green (a new trade-name successor to "Uspulun Fertilizer"), which was extensively advertised and widely tested during the past season. The effective fungicidal chemical in this preparation is the chlorophenol mercury. One pound of Nu-Green contains the mercury equivalent of one-half pound of Uspulun, and therefore results of disease control, as were to be expected, were similar to those previously obtained with Uspulun. Nu-Green, in addition to its fungicide, contains a fertilizer with a high nitrogen content. Wherever it was carefully tested adjacent to areas receiving like amounts of mercury and nitrogen, it apparently gave no better results. On well-fertilized greens it appeared to have little advantage over the cheaper mixtures containing mercury, which may be explained by the fact that on such greens the nitrogen contained in Nu-Green had no chance to exert its value. On greens somewhat deficient in nitrogen Nu-Green gave results which were to the uninitiated extremely striking. Parts of greens were treated with Nu-Green for the control of brown-patch and other sections were left with no treatment whatsoever to give definite checks. The areas treated with Nu-Green soon developed a luxuriant, dark, healthy green color, which stood out in sharp contrast to the untreated portion, where the turf retained its pale yellowish cast so common on many greens. In cases these plots were so striking that they became a source of wonder and amazement to greenkeepers, professionals, club officials, and players. To one who has repeatedly witnessed similar striking results on turf produced by applications of ammonium sulfate, Ammo-Phos, cottonseed meal, or even of the lowly by-products of the barnyard, such demonstrations are not altogether convincing, especially when he looks in vain for any evidence of disease in the untreated portions and then stops to consider the price these clubs paid for their plant food. There is no question but that Nu-Green will control brown-patch just as an equivalent amount of Uspulun or other mercury compounds will do, but we have to discredit many of the enthusiastic reports on the advantages of Nu-Green as a brown-patch remedy, due to the fact that too few observers have attempted to make any distinction between the actual brown-patch control and the independent effect of the fertilizer combined in the mixture. Some have reported that Nu-Green was compared with Uspulun, Semesan, corrosive sublimate or calomel, and that, although these latter apparently checked the disease equally well, "they did not give the grass a dark healthy appearance as did Nu-Green." That was to be expected since these others used alone do not contain plant food. One Chicago club, with 18 average-sized greens, is reported to have prevented brown-patch throughout the summer by a preventive program with Nu-Green and calomel, using Nu-Green for the majority of the applications. The total cost of material for the season was $2,100. Obviously such an expensive treatment for brown-patch control is out of the question for the majority of golf courses.

Semesan and Uspulun

The two common commercial preparations containing chlorophenol mercury (Semesan and Uspulun) were used extensively on golf

courses in most sections of the country where brown-patch is an important problem. Both of these mixtures again gave satisfactory results against both large and small brown-patch on a great many golf courses. There are some clubs that prefer Semesan and others Uspulun, but in the big majority of cases the results obtained are practically identical. Against large brown-patch which was spreading rapidly Semesan and Uspulun were much more effective than calomel, having the advantage of speedy control similar to corrosive sublimate. At least one course, where the question of economy was considered, tried the combination of the more expensive chlorophenol mercury mixture for active large brown-patch and the cheaper chemical, calomel, for the more lasting preventive application. This is referred to in the discussion of calomel, and should be a suggestion worth trying on courses where cost of material is a factor that must be given consideration.

Corrosive Sublimate

Corrosive sublimate apparently was widely used throughout the summer and again proved to be effective against both types of brown-patch. On many courses it is the only chemical used for the control of brown-patch or earthworms, and the greenkeepers have learned to apply it without any noticeable injury to turf. On many other courses corrosive sublimate is regarded as too much of a risk to justify its use even though its cost is lower than that of the other mercury fungicides. A summary of experiences on various courses indicate that this chemical can be used safely and effectively against brown-patch throughout the season, especially in the northern part of the brown-patch infested region, but it must be used with caution, and during part of the summer at least the rate of application must be greatly reduced to avoid injury. It has been found that an application of corrosive sublimate much less than the usual rate will check turf diseases, but such reduced amounts will not give as prolonged protection, and will therefore require more frequent application. A commonly used mixture, in which the basic chemical is corrosive sublimate, is sold under the trade-name "Electric" Worm Eradicator. It has been observed that this preparation, in addition to destroying earthworms, serves also as a brown-patch cure and preventive, apparently in proportion to the quantity of mercury it contains.

Bordeaux Mixture

There are some courses where copper, usually in the form of Bordeaux mixture, is still used for checking large brown-patch. This method fortunately seems to be rapidly losing supporters. The toxic effect on grass due to accumulation of copper in soils on greens in many sections of the country should serve as a sufficient warning to greenkeepers to discontinue the use of copper, or to at least use it as sparingly as possible. On some courses we find greenkeepers continuing to use Bordeaux mixture, even though their greens already show copper poisoning, although they insist on attributing the injury to other causes.

Methods of Applying Chemicals

There are many methods for applying fungicides to greens in use on golf courses. It is evident from the results obtained that any one of the number will produce the desired results, provided reasonable

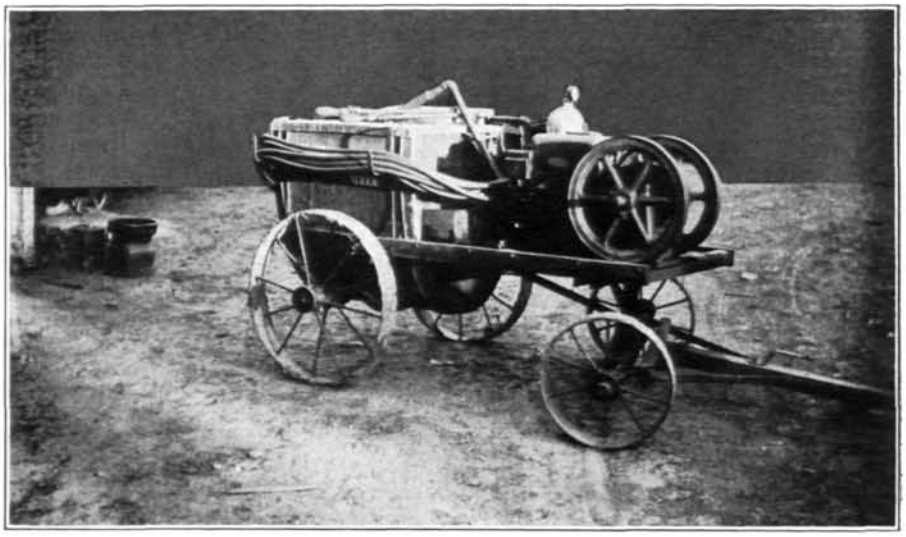
precautions are taken. The procedure which is best for one course may not be the most practicable for another course where the same equipment and the same trained help may not be available. This brief discussion of methods is given in the hope that it may contain some helpful suggestions to clubs where difficulty has been experienced in distributing chemicals.

Applications in Dry Form.—On many courses the chemicals are applied to the greens in the dry form either directly as a dust, mixed with the regular heavy compost, or with a small amount of compost or sand which can be readily scattered by hand. The early method of applying Bordeaux mixture to greens was by means of a dust gun or a common seeder, which distributed the powder rapidly over the greens. This method has been used for distributing the mercury compounds, but it has not given general satisfaction, and there are few courses where chemicals are now applied by this means. The chief difficulty appears to be due to the inability to obtain even distribution of such a small amount of material unless it is greatly diluted with other bulky material. Therefore mixtures with compost or sand seem to be preferred by most greenkeepers who wish to apply chemicals dry.

Those who favor mixing the fungicides with their periodical heavy compost believe that this method greatly reduces the amount of injury to turf. There is much evidence to indicate that this is true, but other greenkeepers maintain that they have obtained the same results by mixing with a small amount of compost, which avoids the laborious task of working the small quantity of chemical through such a large mass of compost. In either case, unless well mixed in the compost, the chemical can not be uniformly distributed on greens.

A method which seems to be gaining in favor is that of using just sufficient finely screened compost or sand to give enough bulk for easy distribution. This varies from one to several bucketfuls per green, depending on the choice of the greenkeeper. It apparently has the advantage of reducing the chemical injury to grass to practically the same degree as the mixture with large amounts of soil as well as offering a much easier task of thorough mixing. An effective device for mixing chemicals with small amounts of compost or sand was produced by Mr. A. G. Chapman, chairman of the green committee of the Audubon Country Club of Louisville, Ky. Furthermore, greenkeepers are able to apply this small quantity much more quickly and may put it on whenever needed, regardless of the regular time for heavy topdressing. The chief objection against this method is the difficulty in finding a man who can be depended on to scatter the mixture evenly. One who has the knack for sowing seed by hand can get an even distribution of chemicals by scattering this mixture just as he would sow seed, but in these days of machinery and seed drills a man with such experience is becoming more and more a rarity. On a number of courses where this method was tested it was found that burning resulted in patches, due to inability of the men to throw the mixture on evenly. It is possible that seed drills could be adapted for this purpose, but as yet we have received no reports of such tests from golf courses. They were used for distributing Bordeaux mixture a few years ago, and it should be possible to utilize them for the mercury fungicides.

Applications in Water.—Various means of applying fungicides in liquid form have been used successfully. On some courses the common garden sprinkling can is relied on for all applications of fungicides. This method has advantages where the greenkeeper wishes to treat only the diseased portions of a green and thus reduce the amount of chemicals required, but at best it is slow and apt to result in uneven distribution. Most greenkeepers have found that any saving in cost of material by this means is more than counteracted by increased labor costs. The gravity-feed barrel sprinkling cart is a great improvement over the sprinkling-can method. If properly used, this equipment gives a uniform distribution of the solution, and, although not as fast as some others, it, nevertheless, is a much more rapid method than the sprinkling can. A great many courses are equipped with these barrel sprinklers, and they apparently give highly



Power sprayer used for applying fungicides at Algonquin. This equipment has been in use for the past two years and provides a rapid and efficient means for applying chemicals. It is comparatively light in weight and is suitable for a hilly course, yet has ample capacity for most needs on a golf course.

satisfactory service. Proportioning machines, as a means for applying chemicals in liquid form, appear to be losing somewhat in favor. Some clubs still find them entirely satisfactory, but on many courses they have been replaced by other equipment, due to the fact that the concentration of the solution they deliver is apt to vary with a resulting uneven distribution of the chemical. There are different types of proportioning machines, some of which appear to give more uniform results than others.

The method of applying chemicals to greens by means of a power sprayer appears to be rapidly gaining in favor. This, of course, is an old method for applying fungicides on many farm crops and ornamental plantings, but until the last two or three years few golf courses have been equipped with spraying machinery. The large demand for spray equipment to meet a great variety of needs for farms, gardens, parks, etc., has resulted in the development of a big assortment of

types of sprayers, varying in price from the cheap hand sprayer to the powerful pressure equipment costing several hundred dollars. From this assortment a club is able to choose one which will best suit its needs. The cheaper hand-pump sprays have given satisfactory results, but are generally considered too slow where it is necessary to fight brown-patch repeatedly on practically all the greens on the course. In almost every case where we have found the motor-power sprayers used on golf greens the greenkeeper has been enthusiastic about this method. It is probably the fastest means for applying chemicals, gives an even distribution, and although the initial cost of equipment appears somewhat excessive for many clubs the savings in labor and time for treatment make other clubs feel that such expensive equipment is fully justified. On courses where large brown-patch is a constant source of annoyance, and where this dis-

Power sprayer used for applying fungicides and fertilizers at Burning Tree. This machine has given satisfactory results on this course for the past two years.

ease is likely to appear at any time on all the greens, the factor of speed in treating large areas is an important one. Also, on courses with heavy play the slower methods for applying chemicals may cause unnecesary inconvenience to players, especially when a severe attack of brown-patch makes it essential to treat the greens on a day when the course is crowded. The size and type of sprayer preferred by clubs varies with the course. Almost any standard power sprayer has a tank large enough to hold sufficient liquid to treat an entire green. Some types have double tanks, which make it possible to fill one tank at the same time that the mixture from the other is being sprayed on a green. On a comparatively flat course this latter type has some advantages, but on a rough, hilly course the lighter type is preferred. Most spraying equipment is provided with good agitators in the tanks to keep the liquid well stirred. This is especially important when slightly soluble or insoluble material, such as calomel, is used. During the summer some cases came to our attention where

the agitators in the tank were not sufficient for keeping calomel well churned up. As a result, there was little calomel delivered during the first few minutes of spraying, but it increased to excessive proportions just before the tank was emptied. The addition of two more agitators in each tank remedied this fault.

Combining Fertilizer and Fungicide.—Many greenkeepers applied various fertilizers together with the applications of mercury fungicides. On some courses it was preferred to apply both fertilizer and fungicide at regular intervals, while on other courses the method used was that of applying fertilizer and fungicide, either separately or combined, as they appear to be needed. Both of these systems have their ardent supporters, and since both apparently give satisfactory results either can be recommended. If the double treatment is to be given with the liquid method of application, it is necessary to use one of the soluble fertilizers, since it is impractical to apply the insoluble fertilizers now on the market by means of the liquid method. The readily soluble fertilizers, such as urea and ammonium sulfate, are more likely to injure grass than are the more slowly available fertilizers, such as cottonseed meal and Milorganite. For that reason it is necessary to apply them with extreme caution during certain periods of summer when grass is sensitive to any chemical. Our attention has been called to a number of cases where combinations of ammonium sulfate with corrosive sublimate or with one of the chlorophenol mercury preparations have resulted in injury. In the majority of these cases the damage can be explained as due to the failure of the greenkeeper to make allowance for the double injury produced by this double treatment. A greenkeeper may have determined the amount of ammonium sulfate that is safe to apply to his greens at any time. Likewise he may have determined the safe rate of the fungicide. Either may be applied in great excess during part of the season without causing any injury. If, however, during a period when grass is "soft," a greenkeeper decides he must cut the rate in two to be on the safe side, and then simply applies one-half his standard rate of fertilizer combined with one-half this standard rate of fungicide he is not actually cutting the amount below the rate he considers safe under normal conditions. From the standpoint of burning, the combination of the one-half rate of each is simply equivalent to the full rate of either when used alone. This difficulty appears to be much too general, and is perhaps due in part to a misunderstanding of our suggestions in THE BULLETIN. We have maintained that fertilizers and fungicides may be applied in a combination treatment without detracting from the value of either ingredient. We should perhaps have made it more clear that, unfortunately, neither did this combination appear to detract from any injuries produced by either. Thus, to take specific figures, suppose a greenkeeper has determined that when used alone 1 pound of Semesan per 1,000 sq. ft. is relatively safe. Also on his greens 4 pounds of ammonium sulfate is regarded as a safe rate for such an area if used alone. During most of the season he can probably use the double treatment of 1 pound Semesan with 4 pounds of ammonium sulfate with little danger of injury, just as he might safely use double quantities of either. But there comes a time during the summer months when, judging from past experiences, the normal rate of 4 pounds of ammonium sulfate is likely to cause some temporary injury. He de-

cides he must reduce his ammonium sulfate to 2 pounds instead of 4. If, however, he then adds ½ pound of Semesan, he may defeat his purpose, for, assuming the injury to his greens is equivalent for these two rates of chemicals, ½ pound Semesan plus 2 pounds ammonium sulfate results in injury equal to that produced by 1 pound of Semesan or by 4 pounds of ammonium sulfate used alone.

When mixed in the dry form with even a small amount of moist compost in which they have been allowed to stand for some time, the fertilizers and fungicides have been applied with little injury to turf. But here again there has been some disappointment, due to failure to make allowance for the double injury during periods when grass is unusually sensitive. Some courses have used cottonseed meal instead of the soluble fertilizers and have obtained good results. At Baltusrol the procedure has been to make a mixture of one bucket of finely screened sand, one bucket of cottonseed meal and the required amount of calomel. This mixture can be quickly and evenly broadcast over a green.

With any method of distributing fungicides, or other chemicals, we find frequent complaints of damage, which can be readily traced to that most general and destructive of golf-course evils—carelessness. In stopping at one course we found inexperienced help applying corrosive sublimate to a green. Apparently the only measure available for these men was the "handful," and it was left to their own judgment as to just how many of these convenient, though crude, measures they used. It was scattered in a bucket of sand and the green was then sprinkled. No attempt was made to distribute it through the sand except to "mix it up a bit." We picked up from the green lumps of corrosive sublimate as large as a good-sized pea. On questioning the men, it was found that they had no idea as to what they were applying. To them the white powder was as that much sugar, and, for all they knew, it was just as harmless. The greenkeeper had complained that corrosive sublimate usually resulted in bad burns. He was finally found in his tool shop puttering around mending some cheap tools. While he was busy saving his club a few pennies in tools, his untrained help was busily engaged in destroying many dollars worth of putting surface. Clubs which permit such methods would do well to make no attempt to prevent brown-patch, for the "cure" is often a greater evil than the disease.

Soils.—Whenever a question is asked regarding turf growing, the character of the soil should always be indicated. Soils may conveniently be classified as clays, silts, clay loams, silt loams, loams, sandy loams, fine sands, coarse sand, in accordance with the size of the ultimate particles. It is well also to state the color—black, brown, chocolate, red, yellow, gray, or white. Any type of soil may contain more or less gravel. The dead vegetable matter, humus, may be present in abundance or scant; in mucks and peats it makes up nearly all the soil. Drainage is also an important factor in soils. The quality of a soil is also indicated by the average yields that farmers get with staple crops, such as corn, wheat, and potatoes. Such a description as the following answers all necessary requirements: Our soil is a brown sandy loam, well drained and considered by farmers to be fairly productive.

AS WE FIND THEM

A greens chairman once told me he did not consider a good greenkeeper an essential part of a golf course. "We use any cheap help for that job. He doesn't have to use his head. We see that he gets The Bulletin regularly, and he simply follows that."

And that fellow is a successful business man! I suppose when he needs a new chief engineer for his big factory he simply goes out and gets any cheap laborer for the job. Then he probably gives him a few copies of "The Bulletin of the Wheels and Boiler Section of the United States Factory Association" and tells him to go to it. Oh, yes! Ask me another!

One newly appointed chairman apologized for the condition of the course (it looked in fine shape to me) and explained, "I have not been in charge many months, and since my appointment I have been kept too busy with my business to properly fulfill my obligations as head of this important committee." Then he explained his theories of turf culture which he hoped to have put into practice.

For the future welfare of the course, may that fellow's business cares increase, may he go on a long journey, have malaria, hay fever, rheumatism, and the gout until a new official is appointed.

One chairman of the greens committee (let's see, wasn't there more than one?) frankly admitted he knew nothing about grass and, furthermore, had not time to learn anything about it. Fortunately for the club (and this is what made him stand out as an exceptional chairman of his class), he did not try to force his ignorant will on the greenkeeper and the club management.

Another chairman of that much-abused committee explained, "I regard my function as chiefly advisory. I have a greenkeeper with years of practical experience who possesses one of the most valuable assets in any job: an open mind. My professional training was of a scientific nature, and I am therefore able to follow any scientific developments readily. My greenkeeper brings any such problem to me, I take any problem of a practical nature to him. We try to develop this teamwork system everywhere on the course."

His course certainly proclaimed the wisdom in that scheme, for everywhere one could see evidences of an effort to "get together"—even to the grass around the divots.