of anything that savors of personal publicity, the reporters give me "honorable mention," and that always helps a pro. Let them "pick up" their own stories about you, though, for trying hard to crash into print on a personal basis is bad for your club and bad for you.

We had a great story with pictures in one of the local papers reviewing our tournament program for last year and it helped to confirm my belief that a well arranged and active tournament schedule is fine for a club. We wound up our tournament schedule October 15 with what we called a "Comedy Swatfest." There were two players on a team, playing alternate shots and all players playing together. Almost every noise-making device known to mankind was used to distract the players. No one was allowed to interfere with a player by physical contact.

Horns, whistles, rattles, cornets, victrolas and a Fordson tractor fixed to backfire every few seconds, were among the devices used. Everyone seemed to hugely enjoy the event and we intend to repeat it this autumn.

"If I Were a Pro,"

BY "A MEMBER ON THE INSIDE"

IF I were a pro, to make myself more and better business, here are some of the things that I would do:

I would always bear in mind that my job was to give service to my club members. I would carry in my stock a reasonable number of the most popular brands of golf balls, so that when one of my club members or his guests wanted a certain make of golf ball I would be able to serve him by having it in stock. No golf pro can successfully carry all of the different brands of golf balls on the market, but no matter what his personal feelings are in the matter, he should carry the leading ones.

If I were a pro, I would take a great deal of pains to see that my shop was always clean and my stocks arranged in an orderly manner.

If I were a pro, I would make every reasonable effort to sell myself and my services to the members of my club. I would do this by addressing circular letters to my club membership from time to time, letting my members know that there was absolutely nothing in golf equipment that I could not furnish them from the stock

that I carried, or that I could not immediately obtain for them. I would always bear in mind that if I wanted to do a good business that I had to go out and make that business for myself.

The position that a golf pro holds with the majority of the members of his club, is such that it should be a very easy matter for him to sell himself and his services to his entire club membership. If he does this he will prosper in every way—in the number of lessons that he gives, and in the quantity of good golf equipment that he sells to his members.

If I were a golf pro I would not complain of the competition of the department stores and of the merchandising type of sporting goods retailer, but I would make a point of competing against this by selling myself to my club members in such a way that they would hesitate a long time before they would buy any golf equipment from anyone else but myself.

If I were a pro and I received a letter from some manufacturer asking me to pay my bill, I would not become insulted and offended by the receipt of such a letter, even if I thought the conditions did not warrant it. Action such as this is childlike and absolutely unbusinesslike.

At all times, I would bear in mind that in large business organizations, mistakes can occur in the same way as the pro's boy in the shop may make a mistake in dealings with his members from time to time. I would look upon all my business transactions as strictly business affairs, and before I would curse out a manufacturer and refuse to continue to sell his merchandise because I had been asked to pay my bill, I would take the matter up with him first—talk it over in a friendly way, and see if adjustments could not be made or explanations offered that would settle matters to the satisfaction of all concerned.

To a reasonable extent, if I were a pro I would display the hangers and the reprints of periodical advertising that is sent to him by manufacturers, for I should bear in mind that many of my members see this advertising in the publications where it is printed, read it and become interested in the product that it advertises. When they see this advertising displayed in my shop, it immediately stamps me as a progressive dealer and lets my members know that I am carrying up-to-date merchandise that is being advertised in national publications.

How Soil Conditions and Worms Affect Greens

By B. R. LEACH

GREENKEEPERS, as a class, have no use for grubs, weeds and brown-patch but there are still a few members of the profession who have a more or less morbidly sympathetic attitude toward the lowly earthworm. Their attitude is based on the supposition that earthworms improve the soil and cause fine turf to grow finer. The argument for earthworms in fine turf is typically presented in the following from one pen: "Consider for a moment the important work that earthworms perform in the soil. They are constantly burrowing through the soil in all directions, thus keeping the soil light and aerated so that the vegetation secures nourishment and grows easily. This lightening of the soil by the worms also causes better drainage."

All of which is interesting but incorrect as one knows who has studied the life-history and habits of earthworms. I always envy the non-professional writer or speaker on turf maintenance. Inasmuch as he has nothing to lose, he can say what he pleases without any fear of a comeback.

Greenkeeper's Plight

Greenkeeping is suffering from the machinations of men who think they know something about turf and insist on writing about what they think they know. This vast output of literary effort is mainly characterized by a deplorable ignorance of technical and scientific fundamentals and gives the studious greenkeeper a bad case of mental indigestion. The poor devil hardly knows who and what to believe, with the result that he doesn't believe anything or anybody.

Inasmuch as earthworms have been repeatedly observed and studied by such famous biologists as Charles Darwin (a complete account of their habits can be found in one of his books, or for that matter in the encyclopedias), there can be no good reason for any lack of sound information with regard to these pests. However, suppose we consider the earthworm from various angles in its relation to fine turf.

Inasmuch as earthworms are animals, they are chiefly concerned with the attainment of three desires—sufficient food, suitable shelter, and the perpetuation of their kind by reproduction. As regards the latter phase of their existence, it is enough to say that they lay eggs in capsules, 3 to 6 in each capsule, the latter the size of a small pea seed. These eggs hatch and the young are fully grown in 4 to 5 months.

Earthworms are omniverous, meaning that they eat almost anything, including each other. In golf greens they feed on the partly-decayed blades of grass which fall in the path of the mower, humus matter in the soil, the eggs and larvae of insects; but they apparently do not feed on living roots. They swallow large quantities of soil merely to assist them in excavating their burrows. This is shown by the fact that earthworms living in poor soils almost devoid of humus nevertheless ingest much soil.

If you examine turf early in the morning you may find little vertical tufts of dried grass blades sticking up, and if you look closely you will see that each of these tufts is projecting from the mouth of an earthworm burrow and that the portion of the tuft in the burrow is much chewed and macerated. In gathering this food, the earthworm comes up so that almost its entire length is out of the burrow but it remains firmly anchored to the burrow by means of its tail. Consequently each worm forages as far from the mouth of its burrow as it can reach. As soon as it has exhausted the food supply within a radius around the mouth of its burrow equal to the length of its body, it makes another burrow at a distance as far out as it can reach while still anchored to the old one by its tail.

The earthworm does its feeding and moving around on the surface generally after dark, keeping under cover during the day when birds and other enemies are around. In making its burrow, the earthworm goes almost straight down, pushing aside the soil particles or swallowing them. When complete, the burrow is a little wider than the thickness of the worm and a little deeper than the earthworm's length.

To prevent the walls of the burrow from crumbling in, the earthworm plasters them with a sort of glue-like cement which it secretes for this purpose. Earthworms rarely go below plow-depth in the soil except during the winter or when the soil becomes very dry during the growing season.

Having constructed its burrow, the earthworm proceeds to live a quiet, uneventful life, hunting its food at night and coming up to void the contents of its lower intestine which are commonly found scattered on the surface of fine turf and are popularly known as worm casts.

Since earthworms burrow in the soil only to the extent of a narrow hole a few inches deep and not indiscriminately here, there and everywhere through the soil like maggots in a cheese, it is rather difficult to understand how they can be credited with aerating or lightening the soil. Furthermore this idea of aerating or lightening the soil by such means as earthworms or spike-toothed rollers is fundamentally wrong. The aeration and drainage of the upper soil layer in a golf green needs no such artificial stimulation, in fact such stimulation is harmful to say the least. Aeration of the upper 3 or 4 inches of a green is entirely a problem of soil texture, proper subsoil and surface drainage and topdressing with the correct soil mixture.

In spite of all that has been written on the subject of golf green construction and care from the soil standpoint, the average greenkeeper still seems to be laboring under a cloud of misunderstanding with the result that fully one-half the work he does and much of the money he spends are wasted. At the start, let me say that the handling of a golf green is entirely and irrevocably different from the handling of any other crop that grows in soil and yet this difference is very obvious if you stop and think for a minute.

The roots of closely-mowed fine turf grasses such as the bents are all within two or three inches of the surface. This means that the soil below this depth is of no importance whatever as far as it affects the grass or supplies food, always of course provided that this under soil is free from lime. Consequently you can forget the soil below the three-inch depth except for one factor and that is the factor of drainage. If your greens are naturally well-drained, well and good; otherwise, tile drains will be necessary not only for the green but for the surrounding ground. The

top three inches of a golf green will never be up-to-snuff if the soil below is saturated with standing water. Such greens are suffering from chronic constipation and you can't cure constipation by rubbing your scalp with hair tonic or bear's oil.

Consequently, when you spend all your money topdressing a water-logged green, you are operating at the wrong end and wasting your time and money. It seems platitudinous to harp on this question of drainage in this day and age, but there are plenty of wet greens in this country. So much for subsoil drainage.

As far as surface drainage is concerned, you would think that anyone with half a head would know enough to avoid dished-in greens where areas or pockets of varying size hold the surface water after a rain simply because there is not sufficient slope in at least one direction so that the excess water can run off. And yet there are not many courses where you don't find some dished-in spots. Such spots are bad, first because they get more water than they should and are therefore generally soggy, and second because this water from the surrounding higher portions of the green carries down soluble fertilizers, brown-patch control chemicals, and the like in excess. As this water in the low spots evaporates, this excess chemical stays in the low spot and takes the punch out of the turf at that point.

Having provided for adequate subsoil and surface drainage, the latter by proper contouring, it remains only to get the upper three inches of soil in the proper physical condition and to keep it so. What is the proper physical soil condition? The ideal physical soil condition for fine turf is embodied in what might be termed a medium loam soil. Such a soil contains sufficient clay or silt so that the soil has a maximum water-retaining capacity, but not so much clay or silt that it is sticky. It contains sufficient sand so that the soil is open and reasonably porous and yet not so much that it dries out rapidly. Such a soil does not mold like putty if you squeeze it when wet, nor does it bake and crack when dry. You can make such a soil by mixing 20 per cent clay or clay-loam with 10 per cent organic matter such as well rotted manure and 70 per cent sand or loamy sand (all ingredients to be free of lime). The sand should be of a coarse nature and you can increase the organic matter 5 per cent

more at the expense of the sand with impunity if you so desire.

As far as organic matter is concerned, well-rotted manure is necessary, but half of the organic matter in the above mixture can well consist of imported peat moss, a product which the greenkeeper will do well to get acquainted with. This material is not to be confused with peat out of our native bogs or the so-called humus or swamp muck which was quite the rage some years ago. Peat moss is naturally rotted sphagnum moss which is taken out of old lake beds in certain of the middle European countries. It is finely granulated and packed dry in 175 pound bales. In the first place this material is as acid as a California lemon or a 40-year-old spinster's tongue which, together with its tremendous water-holding capacity, makes it an ideal material for use in the soil of a golf green. I predict a big future for this material in the golf-maintenance world.

If your golf course is located on a medium loam soil or you can obtain such soil for topdressing, count yourself lucky. If your course is located on heavy clay or on a sandy soil, it will be necessary to alter your upper 2 or 3 inches of soil on the greens so as to approximate the medium from soil type. If you are planting a green on heavy clay, contour the green as you wish it to appear finally and then spread two inches of sand over the surface, add a light covering of organic matter and then work the surface to a depth of *three* inches, no more, so that you drag up about three-quarters of an inch of the clay and mix it with the sand and organic matter.

Better still, spread the two inches of sand over the green and then half an inch of clay on top, together with the organic matter and work the mixture to a uniform condition and plant the seeds or stolons. If you are building a green on sandy soil, spread half an inch of clay or clay loam on the surface together with the organic matter and work it in to a depth of three inches and plant the green. This system in either case will give a 20 per cent clay content in the upper three inches which is exactly what you want and *no more*. If you don't want the surface to be sticky in wet weather and to bake and crack in dry weather, 20 per cent clay is the limit in a golf green. A soil containing more than 20 per cent clay, say 30 per cent, is practically as sticky as one containing 90 per cent clay, although not many green-

keepers seem to be aware of this truth.

When it comes to topdress, use the mixture of 20 per cent clay loam, 10 or 15 per cent organic matter, and the balance coarse sand. Never forget that the topdressing you are applying today is the golf green of tomorrow and act accordingly. You can ruin a golf green in a season by top dressing with the wrong soil mixture and spend the next two seasons in getting it back into shape. When greens are built and topdressed in this way the aeration and drainage of the upper three-inches will take care of itself and I assure you that the earthworm will not be necessary. As a matter of fact, however, other things being equal you will have plenty of earthworms in such a green because when you provide these ideal soil conditions for the fine turf grasses you incidentally supply the very conditions most desired by earthworms. Hence they will flock to such greens and control measures will be necessary. In next month's article I shall have more to say about soil conditions as affecting the earthworm population, together with a discussion of methods of earthworm control in fine turf.

Eagles Mere Has Policies That Work Right

Eagles Mere (Pa.) Golf club has 27 holes located beautifully in a well favored resort section of Pennsylvania. Although the resorters who have their own summer homes and those who are guests of the several hotels might be considered to be classes of such divergent interests that they might clash in the management of a golf course, quite the contrary is the case.

Some of the policies that have worked out successfully in making the Eagles Mere Golf club an excellently managed institution are related by David Roberts, chairman of the green committee.

Mr. Roberts tells GOLFDOM:

"Our Green committee is small (three in number), always working in practical unison. They all love the game, and play it, or try to. They all are, or have been, practical business men. The chairman has served for seven consecutive years, and one of them for a longer period. The chairman also served a number of years as committeeman at his home club.

"The greenkeeper is a practical native mountain-top farmer, a brainy man wholly

absorbed in his work, who works harmoniously with the chairman, the two holding daily consultations and inspections.

"A determined endeavor to have the golf course in pink of condition if possible every day, weather permitting; always looking out for a chance to better and improve. This tends to keep players in good humor.

"Willingness to listen to advice and comments; talking over matters with the committee, and using own judgment afterwards; trying not to be disturbed by criticisms, but not always succeeding.

"Cordial coöperation by the officers of the club with Green committee and its chairman; most of the Governing Board are hotel men and active business men. The hotel men realize that the golf club is a big asset to their business.

"Upkeep expenses are looked after all the time, and labor saving machinery investigated carefully before adoption.

"A Boy Scout caddy system that after five years' experience is well established and has found to be indispensable.

"We have a beautifully situated golf course, with many natural hazards, and not too many artificial ones."

How Olympia Fields Handles Its Caddies

By TOM ELLIS
Supt. Golf, Olympia Fields Country Club

OLYMPIA Fields Country club has planned that 1928 will be the best year in its history for the caddies.

In 1927 we had 1468 caddies registered for the season, and expect more in 1928. In the past Olympia has partly uniformed its caddies. This year they will be furnished with a complete uniform. The caddy pays less than 20% of the cost of the uniform, the balance being pledged by the members. This gives the caddy a more businesslike aspect. It is quite a sight to see over a thousand caddies in uniform.

George F. Anderson, chairman of the caddy committee, has ordered a large supply of equipment for baseball, basketball, soccer, horseshoes, etc., for the caddies' pleasure. Enough of this equipment has been ordered to give each caddy a chance to be in some game or play during his spare moments.

This year, as in the past, the caddies will play golf every Monday. They will also have their annual caddy tournament

and field day. For the events on this day donations amounting to about $1,000 are made by the members for the purchase of prizes.

Considering the large number of caddies in service, discipline is a simple matter, in that each boy is kept busy in his spare time.

Caddies meet in a school for training purposes four mornings each week. About two hours of each session is spent teaching the rules of the game and the duties of a caddy. This gives him not only an understanding of the game, but also makes plain his obligations to his player.

Our registration and classification system is made as simple as is possible. When a caddy reports for duty April 1st his name, address and such data as is necessary is entered on an individual merit card. His merit record of the previous season denotes his classification for the current year. We have 50 Honor caddies who have reached this designation by experience, proper conduct and native ability as caddies. There are 250 Class A caddies whose individual numbers run from 51 to 300, paid at the rate of 30c per hour; 300 to 700 of Class B at 25c an hour, and 700 and up Class C caddies at 20c an hour.

Caddies register as they report for duty and are assigned according to this registration. The caddy is graded on his time card by the player at the completion of his daily service. This card is turned over to the caddy-master and the grading is transferred to the caddy merit card. We give prizes each month for the best grade in each class. If B and C caddies have a very good mark they are transferred to the next higher grade, likewise if Class A caddies make a poor showing they are demoted to Class B until such time as they have earned the right to advance to their former grade. The caddy merit card is checked by the caddy-master every week and promotions made accordingly. All caddies are confined to the caddy shelter until the members register for them. A checking service is established at the caddy house for lunches, etc.

GARTERS that hold patented tees are one of the newest novelties in golf accessories. The pro who stocks items like this in his shop, not only picks up sales but keeps his members reminded that his shop is the place where the golfer sees the best first.

Proper Nitrate of Soda Use in Greenkeeping

By D. T. CROAL

Grand River Country Club, Kitchener, Ontario, Canada

THE only way to be successful with fertilizers is to study the crop which is intended to be grown and in the greenkeeper's case it is grass. To any plant there are three essential elements of food—nitrogen, phosphoric acid and potash. These elements are all found naturally in good soil in varying amounts. The element nitrogen is the element that makes leaf in a plant and as the greenkeeper is striving to grow grass (leaves), nitrogen must therefore predominate in all fertilizer mixtures used.

There are different sources of nitrogen, and the most commonly used today on the golf course are sulphate of ammonia, nitrate of soda, blood meal or tankage.

There has been a great deal of controversy about the use of nitrate of soda on putting greens, and most greenkeepers stick solely to sulphate of ammonia. This is due to ignorance and indiscriminate use of nitrate of soda as nitrate certainly has its place on the putting green as well as sulphate of ammonia.

When using any fertilizer the greenkeeper should always remember that it must be in solution before it is available. In the case of nitrogen it must not only be in solution but must be in the nitrate form before it is available.

Nitrate of soda is already in the nitrate form and as it is extremely soluble is available immediately it is applied.

Spring Tonic

In the early spring therefore a few pounds of nitrate of soda (about 5 lbs. per 1,000 sq. ft.) will start a green growing and act as a spring tonic.

Sulphate of ammonia and blood meal