



*These two pots of grass were grown side by side in a moist greenhouse. One was "inoculated" by placing a piece of the fungus in the center but the other had nothing added. As is shown in the pot at the left, the fungus had overgrown and killed all the grass in a short time, while the other remained healthy*

on the bread fungus applies to the one causing brown-patch.

#### ***The Effect of Temperature***

Temperature also has a direct bearing on the growth of fungi. Those causing brown-patch grow best at relatively high temperatures. This is particularly the case with large brown-patch. We know that some of our best turf grasses grow best in the comparatively cooler periods of spring and fall and that the extremely high temperatures of mid-summer tend to decrease the vigor of the grass plants. Therefore a high temperature which checks the grass and stimulates the fungus feeding on the grass makes conditions ideal for the development of brown-patch.

The acidity of the soil, amount and kind of plant food available, and a great many other factors may have direct or indirect effects on the growth of the grass and the fungi; thereby influencing the occurrence of the disease.

This means that one night the dew, soil moisture and other conditions may be favorable for the development of the fungus, except that the temperature is too low; therefore brown-patch will not appear.

#### ***Circulation of Air Important Factor***

At another time the temperature, soil moisture and other factors are favorable but throughout the night

there is sufficient breeze to keep the surface of the grass dry so that the fungus is unable to grow. It may be that the breeze keeps all the greens dry except those that are situated in low protected areas or where a bank of trees or heavy shrubbery prevents the proper air circulation. Frequently these low areas occur only in certain parts of a single green. Under such conditions the disease may appear only on these greens, or portions of a green, where there are these so-called "dead air pockets."

Likewise there may be any number of possible combinations of conditions which will determine whether or not brown-patch will develop and whether it will appear in scattered areas or over the entire course.

This explanation no doubt will sound complicated to many greenkeepers. However, anyone who has watched the periodic appearance of these injuries on turf will realize that brown-patch certainly is a puzzle. We frequently find a man who is sure that he knows the last word in brown-patch and can tell the whole story in a few words. Needless to say that man soon displays his ignorance. When one is working with a living thing such as grass he has plenty of complicated problems—otherwise there would be no need for a greenkeeper. Add to

*(Continued on page 31)*





*W. D. Chinery*

# *Thirty-Seven Steps To York Downs*

By W. D. CHINERY

Greenkeeper, York Downs Golf Club, Eglinton, Ontario, Canada

**I**T is some thirty-seven years ago that I commenced my training as a professional gardener, on a large private estate in the old country. From a golfing point of view it may be said I started in right, as my first job was assisting in cutting and laying turf. I obtained a varied experience in ten of the leading establishments in as many counties. One of the most important branches of horticulture is the upkeep of the spacious pleasure grounds including cricket, tennis, croquet, lawn, etc., and of the care of these I have had my share.

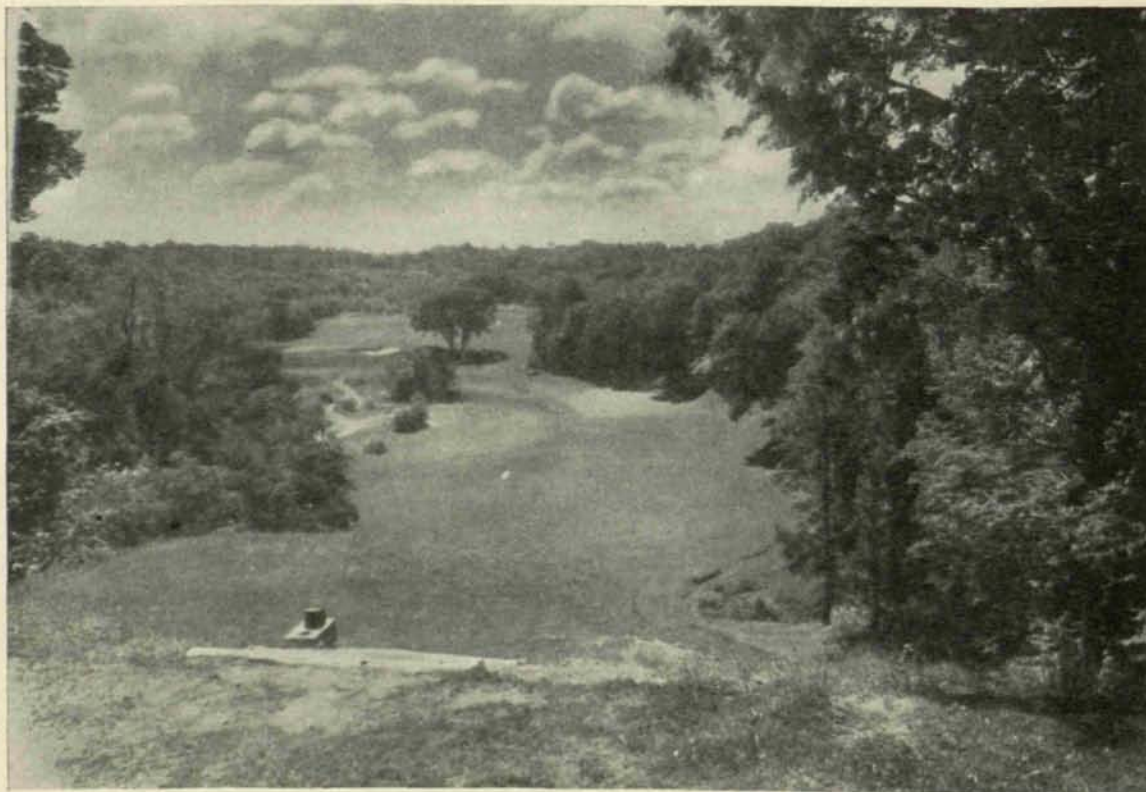
Coming to Canada fourteen years ago I endeavored to follow my profession, but soon found there was little scope for that class of gardening. I was fortunate in meeting with Mr. G. Cumming of the Toronto Golf Club,

who advised me to take up golf course work. My first charge was the Scarboro Golf & Country Club. During my stay of five years there, we had such notables of the golfing world as Mr. Charles Evans (Chick) of U. S. fame, Vardon and Ray, Mitchell and Duncan, the Canadian and U. S. Seniors, with several minor events.

York Downs, my present club, is one of several laid out five years ago, the architect in this case being Captain Alison.

## *Two Distinct Kinds of Soil*

Our course takes in part of the Don River Valley, where we have several spectacular holes. There the soil is typical for the purpose being of a deep, friable black loam inclining to sand. The opposite may be said of the upper part of course, which is a very heavy adhesive clay, given to baking and cracking. To combat this evil we have, during the past four winters liberally treated the fairways with coarse sand, applying over 5,000 loads and with good results.



*Third green from front tee, 250-yard hole, with sixth green in background. Creek to right. York Downs Golf Club, Eglinton, Ontario*



During the same period on our long holes, say about 180 to 240 yards, i.e., our first shot, we have top dressed with compost, also all our approaches. From now on we intend to give more attention to our rough, which by the bye should receive more attention than is generally conceded.

#### *Chain Harrow Invaluable*

Two Toro Tractors (with five units each) take care of the course, in cutting, rolling, screening compost, chain harrowing, etc. A word or two about these harrows. I may say they are little known about here. I consider them one of the best implements that any golf club can have. They are invaluable for pulverizing and working in any top dressing, splendid for the rough, and when the course gets infested with worm casts towards the end of the cutting season.

#### *Large Greens Not Desirable*

There has been a tendency for some years to increase the size of putting greens, and here I think is cause for criticism. Too large a green does not improve the game, and is maintained only at great cost. The greens here were seeded down with South German bent, great care being exercised to obtain the very best seed, and they will average about 12,000 square feet in size.

One hears a lot these days about bent. Some things I hear are only to be accepted with the proverbial pinch of salt. For instance, that bent greens require little if any top dressing and will choke out weeds. All bunkum. That good bent grass when well grown has a tendency to choke out some weeds is true. My experience is that bent requires frequent top dressing and a copious supply of water. I might also add, frequent weeding. We have quite a variety of native bent in our neighborhood, which I am experimenting with, two kinds of which may be useful, but more of this anon.

#### *Top Dressing Greens*

We invariably weed our greens before this takes place and when desirable do not spare the use of good sharp, round toothed rakes. Raking tends to bring up any runners of clover that may be there, besides making a good bed for the compost, which should be of the right consistency for rubbing in. We use from two to three yards of finely screened compost, placed in as many heaps in proximity to the green, not dumping too frequently in the same place. The reason is obvious. As we have not acquired any of the top dressing machines, we have perforce to carry on by hand.

Our modus operandi is four men with flat, square mouth shovels and two bamboo poles, not too whippy.

We attack one heap first and deposit where most required, bearing in mind the hollows will always get plenty of food and cover. Trained men will distribute evenly and quickly over a large space. When half of the compost is on the green, two men with poles work compost well in. By then the whole green is covered, the process of rubbing in completed, the green then ready for cleaning off with the J. D. Rakes. Without too much hindrance from players six men thus equipped can top dress and finish a green in an hour at a cost of about \$2.50. It is well to cut such greens as short as possible, or reasonably so. They will then go for two or three days, thus avoiding picking up much top dressing. We use Sulphate of Ammonia in a dry state, also in liquid form, using a 50-gallon barrel with six foot boom. A light dressing of sharp sand at intervals we find highly beneficial in various ways.

#### *Brown-Patch Disease and Watering*

Space at this time will not permit me to go into the question of the brown-patch disease, although of great import, but I wish to say that I am closely watching the action of bichloride of mercury. I hope some of my confreres who have had experience with this and whose greens have suffered will give us some of their experience. Regarding watering, this is a point that has been threshed out time after time. Suffice to say we water when necessary, for preference early morning and late evening and for these reasons only, namely, there is less hindrance from players, and less evaporation than in between times.

Dame Nature often visits us with a heavy downpour to be followed soon after with brilliant sunshine, and thus Nature explodes the fallacy of day watering.

#### *Training Assistants*

In the March issue both Mr. Herbert Shave and W. J. Rockefeller have dealt with this subject, and their policies I fully endorse. Generally speaking the competent man will inspire confidence on both sides. Unquestionably the finest thing for any governing body is well trained and well directed labour. Without this the handling of the best of equipment and material is nullified. Mr. Shave has said, "Good greenkeepers are scarce." The reason is not far to seek. Allow me to quote an instance. During the past five years there have been many golf courses laid down around here, but not to my knowledge has there been an assistant appointed to take charge, not because there are no good men, but rather because they have not had the chance. I hope none of my readers will misconstrue this, but accept it in the spirit in which it is meant. None of us are too old to learn. I may be excused if I say in justice to myself, I





*Plenty of trouble on Number 7 at York Downs, 456 yards of it. Taken from middle tee, showing creek*

know of one whom I assisted and who is making good at Beach Grove Golf Club, Tecumseh, and on March 1st, my assistant went to the Thornhill Golf Club where they have 27 holes.

At York Downs last year was staged the Ontario Amateur and Ontario Open, and while it was on the cards to hold the Canadian Open here this year our officials ruled otherwise.

## Have You Seen "Snow Mold"?

**J**UST at this time John Monteith, Jr., author of the article "Can You Identify Brown-Patch," appearing in this issue, is investigating "snow mold," an early spring type of turf kill having the general appearance of Brown-Patch. Members of the N. A. G. A. are requested to report all cases of the appearance of such a disease, with full description of the methods used for control and the results shown. Please state fully the exact appearance of the spots, and give information as to the location and drainage of the green or greens affected. If any unusual circumstances relating to original construction prevail, please give them in detail. Mail reports to the office of the association at 405 Caxton Building, Cleveland.



# The A B C of Turf Culture

## The Part Water Plays in the Growth of Turf

By O. J. NOER

**T**URF in common with all other plants requires water and is among the first to suffer during periods of drought, due to its shallow root system. There are periods during every season when turf suffers for want of water. Soil is the reservoir from which water is obtained, and since soils differ in their water holding capacity and ability to supply water a clear understanding of the relationships between plant, water and soil is essential.

### Functions of Water

In amount water is the main constituent of grass, constituting 60 to 80 per cent of the green weight. Water serves the growing plant in a number of ways. It gives the plant rigidity. When the supply becomes limited plants first wilt and may finally succumb. In the leaf it serves as a direct food, being broken up and its elements utilized in the manufacture of starch and sugar. It serves as the vehicle for the carriage of the mineral elements of the soil and the gaseous substances of the air to the places where they are utilized by the plant. Water is also constantly evaporated from the leaf surfaces. This evaporation tends to control the temperature of the plant and enables it to better withstand intense heat. The effect is the same as the cooling effect of evaporating perspiration. During hot periods plants often wilt during the middle of the day when water is not absorbed rapidly enough by the roots to compensate for these losses at the leaf surfaces. Towards evening evaporation is checked by the cooler air temperatures and the wilted condition disappears. Very much more water is evaporated from the leaves than is used directly as food. Investigations show that from 200 to 500 pounds of water is evaporated for every pound of dry matter produced. The amount varies and is affected by a variety of conditions such as air temperature, amount of water in the soil, etc. It is probably safe to say that 5000 barrels of water are evaporated during the production of 1½ tons of dry grass. This amount of grass is often produced on each acre of fairway. Is it any wonder that insufficient water so often limits turf growth on fairways?



O. J. Noer

Editor's Note: For the past four years Mr. Noer has investigated the value of various fertilizers in relation to golf turf at the Soils Department, University of Wisconsin, under a fellowship established by the City of Milwaukee.

### Amount and Kinds of Water in the Soil

The amount of water contained in the soil depends upon a number of factors. Obviously it is profoundly affected by the extent and frequency of rains or artificial additions by sprinkling or irrigation. The physical condition of the soil, especially the size of the individual particles and the amount of organic matter or humus, exerts a marked effect. During dry weather turf on sands suffers first and dries out long before turf on heavier soils. This is due to the great difference in the retentive capacity of the two soils. It is doubtful if sand can ever be made to support good turf in areas of limited rainfall unless its physical condition is modified, or provision is made to apply much needed water. Naturally the rate and amount of water lost from the soil also affects the soil supply.

Three kinds of water exist in the soil, namely, hygroscopic, gravitational, and capillary. It is from the capillary water that plants satisfy their requirements. Hygroscopic water is the moisture which condenses on the surface of dry soil when exposed to the air, and is held so firmly that plants cannot use it. In amount it rarely exceeds a few per cent, and naturally soils made up of very fine particles contain most because such soils expose the largest surface. Gravitational water is the water which is free to move under the influence of gravity and passes down through the soil when conditions permit. If this free water remains in the surface soil it fills the spaces between the individual particles which should contain air to supply the turf roots with needed oxygen. Excess water also inhibits the development of beneficial soil organisms and prevents the soil from warming rapidly in the spring. Where natural drainage is poor supplementary drainage must be provided to insure rapid removal of gravitational water. This is the first essential in turf culture because other treatments such as fertilization will never produce maximum benefits until adequate drainage is provided. Capillary or film water is the water held around the individual soil particles as a film and is the most important from the standpoint of turf culture. The water surface on the



outside of the film acts as an elastic covering or skin and is responsible for the movement of capillary water. When water is removed by the plant root or evaporation the stretched film pulls water from adjacent areas until the strains are again equalized.

The size of the individual soil particles exerts the greatest effect upon the amount of film water a soil can retain. Soils made up of small particles hold the most because they contain internal surfaces. Loam and clay soils retain from two to three times as much film water as sands. Structure in the arrangement of the soil particles also exerts a marked influence. Loosening the structure of sandy soil often lowers its moisture holding capacity. The individual particles are so far apart that the formation of a continuous film is prevented. An open or granular structure, that is grouping of the very fine clay particles into larger particles, increases the supply. Water is held around the individual particles of the granules and also surrounds the compound granule. Thus such grouping increases the surface exposed.

Organic matter affects the soil capacity for moisture in several ways. Humus has a large capacity for moisture but it also acts as a weak cement, and aids in producing the desirable grouping already mentioned.

Plants cannot use all the capillary water held in the soil supply. Water is taken most readily by the roots when the films are thick. When the thickness of the film is reduced it becomes increasingly difficult for the plants to obtain water, and before all the capillary water is removed the plant begins to wilt. The relationship between texture, capillary water and available water is illustrated in the following table.

	Percent Capillary Water in soil	Percent Water in Soil When Plants wilt	Percent Available Water
Sand .....	8	3	5
Silt Loam .....	25	15	10
Clay Loam .....	40	23	17

Sandy soils contain only small amounts of available water and never hold enough to carry growth through the season, even though plants can use a larger percentage of the moisture originally contained in such soils. Even clay soils do not carry enough water, including all moisture to a depth of 324 feet, to satisfy the entire demands of deep rooted crops such as corn. Is it any wonder shallow rooted turf grasses so often suffer? The supply must be replenished by rainfall, irrigation, or movement up from the subsoil.

#### *Movement of Water In The Soil*

When rain falls upon a soil absorption takes place and the excess gravitational water passes down through the soil as a result of the pull of gravity, and capillary water

is left surrounding the soil particles. Absorption and downward movement is rapid in sands because of the large spaces existing between the soil particles. Clays seldom contain large spaces because of the minute size and close packing of the individual particles.

These small spaces together with the resistance offered by the particles themselves prevents rapid downward movement. The pressure of air in the minute pore spaces hinders the entrance of water especially if the subsoil is dense or full of water. Only as the entrapped air manages to escape is water absorbed. This is why heavy showers are often of so little benefit. Tile drains in such soils facilitate the entrance and movement of rain water by providing a channel for the escape of entrapped air.

#### *Movement of Capillary Water Important*

Since plants depend upon capillary or film water for their main supply, its movement in the soil is of great consequence, especially when the diminishing supply in the surface soil can be partially replenished by capillary rise. Soils made up of fine particles have a greater capacity and can move water to greater heights than the coarser soils, but the rate of movement is most rapid in the coarser soils. Very often the rate is so slow in clay soils that plants perish before water is brought up from the subsoil to meet the demand. The friction is so great that the actual movement is very inefficient. All things considered it is the soils of intermediate texture, sandy loams, loams and silt loams which most readily meet the needs of the growing plant for water.

When a soil becomes dry the capillary rise of water is greatly retarded, because such soils resist wetting. Hence soils must be damp if rapid rise of water is to take place. Movement is also slower when the films surrounding the particles are very thin due to the friction offered by the particles themselves.

#### *Maintain Soil Conditions Which Favor the Retention and Rise of Capillary Water*

Since water so often limits growth it is essential to produce soil conditions which insure maximum retention and rapid capillary rise of water. Providing adequate drainage is the first essential. On the heavy soils this increases the amount of available water and produces conditions which favor more effective absorption of water. It is only on greens that soil texture can be thoroughly modified. The huge expense generally prevents such practice on fairways. During the construction of greens great care should be exercised to provide soil of good texture. There are altogether too many instances where this has not been done. All things considered a loam soil is best. Such soils readily absorb

(Continued on page 32)



# Step Out of the Rank and File

By ED. B. DEARIE  
Greenkeeper Ridgemoor Country Club, Norwood Park, Ill.



Ed. B. Dearie

**G**REENKEEPING has proved conclusively that it is an art, and I have often wondered if the greenkeeper is appreciated at his true worth. No one can realize more accurately than the greenkeeper the importance of his work and the necessity to give his best. The fact is always impressed upon him that upon the success of his work depends the pleasure of the players.

At the present time, the art of greenkeeping is in a very rapid stage of development due to the decided improvement in maintenance equipment and the constant investigation of turf growth and its problems.

It is through the results of improved methods that greenkeeping will reach a higher standard than ever before and the thousands of dollars spent annually on golf courses will not have been spent in vain.

## *One Source of Authority*

The greenkeeper should be responsible for his work directly to only one person, either the chairman of the Green committee or the general superintendent—if there is one—and thus receive his authority and orders from one source which will eliminate any possibility of complications.

He should have entire responsibility for the upkeep of the course, the care of the tools, machinery, etc., the selection and employment of all assistants and employees under him and be responsible for the efficiency, thrift and intelligence of these same employees.

## *Keep System of Costs*

He should be responsible for keeping in the form prescribed by the club accurate time cards and records of all work done. These records should show where the money is spent. From these records, it should also be possible to learn how savings can be effected. The greenkeeper should also obtain from the chairman reports showing the total cost of the work so that he may be familiar with the expenses incurred in the same form presented to the chairman and board of directors from previous years. He should cooperate in the assistance of bookkeeping systems deemed desirable by the treasurer which include the preparation of pay-roll, records, receipts of supplies and inventories of tools, machines and supplies on hand.

The greenkeeper should have sufficient knowledge of the fundamental principles underlying botany and chemistry so as to know exactly the character of the herbage of his greens, the kind and amount of top dressing and fertilizer they may require as it is unquestionably the greens that measure the success of the greenkeeper. Knowledge of soil qualities, the use of fertilizer and top dressings are vital elements in efficient turf maintenance.

## *Meet With Other Greenkeepers*

Join the Greenkeepers' Association in your district and arrange to attend the occasional visits to the various courses as this will materially benefit each man regardless of his present knowledge because of the new problems that constantly arise. The greenkeeper will thus be able to confer with other greenkeepers and help to educate himself in the art and science of modern greenkeeping.

## *Train Your Men and Develop Yourself*

The greenkeeper should work with the idea of training his men to understand turf upkeep in a general way. It is a wise plan to give each man specific care of some particular job for which he can be held reasonably responsible and to pick one or two men for the difficult jobs that require special judgment and encourage pride in the work they are doing. This is more important than to waste valuable time, money and energy on work that is of no avail.

## *Keep Track of Your Equipment*

Next to an efficient crew of workmen, the greatest asset to a greenkeeper is efficient equipment as this has been greenkeeping's greatest advance towards arriving at a standard of cost for maintenance. The average club member would be astonished to know how much money his club has actually invested in equipment for maintaining the course. The greenkeeper should know this and an inventory at least once a year should be made



showing the depreciation of all of the equipment that will result from constant usage, and this should be published for the benefit of the members. The equipment required for a first class course means money and should be an item accounted for yearly and submitted to the chairman for accurate records of the club files.

### *Five Friendly Tips*

In greenkeeping as in other work that requires a clearly defined policy the man in charge should be given the responsibility to control the operation of his work. By the very nature of this kind of work, he must be the best possible judge of what is required as new methods of procedure are constantly rising. Green committees should realize that the greenkeeper stands or falls by the quality of the work he produces.

The following hints may be given to every man who wishes to become a progressive greenkeeper:

Plan your work logically and systematically in advance so that on the following day each man knows the exact amount of work he must accomplish, thus eliminating any unnecessary work.

Develop initiative and endeavor to see where improvements are needed before the chairman sees them. Always keep several jumps ahead of your chairman.

Consult your chairman of the Green committee on all problems that arise outside of the general routine. This is the safest way as this method will lessen the danger of a misunderstanding.

Be willing to give consideration to new ideas no matter what the source and take them at their face value.

Know how to take orders as well as to give orders. Learn your job from every possible source. You should keep your course to the front. You make the course and the course will make you.

The greenkeeper who gets the most done and still has more time on his hands for other things is the one who goes at his work from a carefully mapped out plan.

### *Plan Each Day's Work*

Time used in thinking out things the night before is time well invested. Never waste time on unnecessary things. Do all the job requires and do it thoroughly. There is an easy way and a hard way. Seek the easy way and use your time on things that will count.

Pick out the features of your work which are essential. A greenkeeper should love his work. He should take a courageous attitude, for greenkeeping is like every other business which has many obstacles in its way and a course is very often neglected because there is a lack of courage on the part of the greenkeeper.

### *Success Rises Out of Mistakes*

Never entertain a thought that it is impossible to do anything. Find some way to accomplish it, as you can if you will try. A man who never makes a mistake never makes anything else. I have made mistakes but found them to be factors in my improvement. Study your mistakes. No one ever gets too big to make mistakes, and no man can live by his failures. Experience teaches one that common sense is on the greenkeeper's side in this matter. The secret is that man is greater than his mistakes and can arise right out of them and pass beyond them. Though you may do your best you will find you have made errors. Profit from them and go ahead.

The greenkeeper has a great responsibility, because of the hundreds of thousands of dollars entrusted to his care. He is in very truth a specialist of high order, a master of the complicated factors of greenkeeping. This trend of specialized knowledge is by no means limited to greenkeeping but it is an almost universally applied principle to each branch of this and other recognized professions. A greenkeeper must be a student if he is to command the respect of his members and the world stretches out its hands to receive the exponent of a worthy effort, offering unlimited rewards to those who by reason of their superior skill are able to stand out from the rank and file of their chosen profession.

## **GOLF CLUB OFFICIALS!**

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**Al Schardt**

how to handle the men and that is something every good greenkeeper must know, and is quite as important as knowing grass.

Much has been said about how the different work is done on a golf course, but seldom do we see anything written about how to handle men.

#### ***Suggestions from Workmen Often Good***

We all know that there are certain kinds of work that must be done by hand, and I have often been asked, "How can you get a man to do a certain job without being right there to see that he does it right?" In the first place I get all my men together about once a month and ask them for ideas and their different opinions on things pertaining to the work about the course. This not only makes them more interested in their work but gives them a chance to talk over and right little misunderstandings.

A boss should not be under the impression that he is be-littling himself just because he accepts the ideas of the men who work under him, for after all it is the men who actually do the work and who can sometimes see a quicker and easier way to get it done than the one who gives the orders. Some may think that by using this method the men will try and run the job but that is not so. If a man is told to do a certain job a certain way and he can see an easier way to go about it, let him do it his way, so long as in the end he gives results. If he has to do it the hard

# ***Diplomacy Pays***

By AL SCHARDT

Greenkeeper, Wanakah Country Club, Buffalo, New York

IT is not the purpose of this article to try and tell the experienced greenkeepers how to handle their men, but is written with the thought that it may be of some help to the less experienced.

There are a lot of good men who would be capable of holding a job as greenkeeper if they only knew

way just because the boss told him so there will be grumbling, dissatisfaction, and a loss of time.

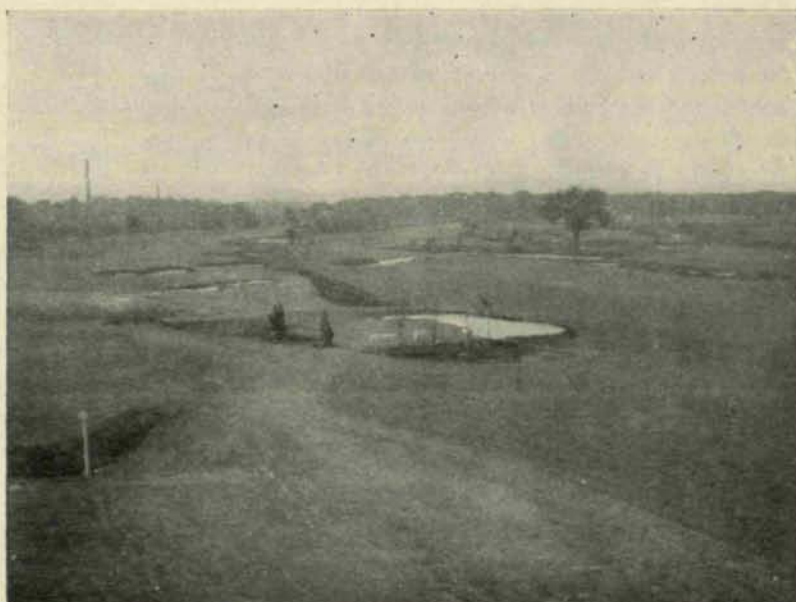
By all this I do not mean to convey the idea that a boss or greenkeeper does not have to "know his onions,"—indeed not. The greenkeeper should know how to go about any work to be done, but sometimes your men can do a job their way and get it done quicker than doing it your way. Not because your way is harder but because they are used to doing it their way, and therefore can do it quicker the way in which they are accustomed.

#### ***Clean Tools Every Night***

I find that getting men to clean their tools and put them in their regular place after the days work is done is a hard problem. They always seem to like to put them away without cleaning and the next day grab the clean ones. I generally hang around the tool house when the men come in and if I see a man hang up a dirty shovel or throw his tools in a corner, he is told that each tool has its place and that it must be cleaned and in good condition and kept in its regular place. After that if he cannot find where the tools belong and put them there he is told to look for another job. A man who does not

*(Continued on page 34)*

## ***A View of the Wanakah Course where the Buffalo Championship will be held***



***Rolling contour, well placed traps and natural hazards combine at Wanakah to keep up the interest of the golfing members***



# From The Viewpoint

What District Association

## *The Greenkeepers' Club of Western Pennsylvania*

IT was on March 17th in the year 1926 that the Greenkeepers' Club of Western Pennsylvania was born. The date in itself, in any Irishman's eyes, would tend to make this a wonderful organization, and I can truly say that it is.

This association is composed of Greenkeepers employed in and about the district of Western Pennsylvania for the purpose of developing greater interest in greenkeeping thereby creating better opportunities for those engaged in this profession; also to uplift the vocation of greenkeeping and to create a closer friendship with our fellow Greenkeeper.

In the past year, I am happy to say, all of our purposes have been realized. Meetings are held the second Monday of each month at the Fort Pitt Hotel, Pittsburgh, Pa., at which dinner is served. At each meeting there is a general discussion on the very problems that come up from time to time, such as, various equipment, water systems, landscaping, building roads and drains, brown patch and many other questions pertaining to the proper upkeep of golf courses. Two heads, they say, are better than one, so therefore when ten or twelve practical Greenkeepers get together on these questions there is always a satisfactory solution to each and every problem that may come up at any time. This as you can readily see, is of a great assistance to both the Greenkeeper and the club at which he is employed. In other words each golf club is supervised, more or less, by the association as a whole.

The annual meeting for the election of officers is held the second Monday of December of each year and at the last annual meeting the following officers were elected to serve for the ensuing year:

President, John Pressler, Allegheny Country Club, Sewickly, Pa.; vice president, John McNamara, Pittsburgh Field Club, Aspinwall, Pa.; secretary treasurer, Chas. Nuttall, Fox Chapel Golf Club, Aspinwall, Pa.

It might also be interesting to know that when the question of joining the National Association of Greenkeepers of America was brought before our members we decided and did join the National Association in a body.

By John McNamara,  
Vice President.

## *Mid-West Greenkeepers' Association* (Minutes Meeting May 2)

A MEETING of the Mid-West Greenkeepers' Association was held May 2nd at 7 P. M. at the Great Northern Hotel, Chicago. The minutes of the previous meeting were read and approved. The report of the treasurer is as follows:

The membership committee reported that there were 14 applications on hand which they had approved and a number of checks on hand, a report of which will be given at the next meeting.

A discussion was then held regarding the summer outdoor meetings as to where and how these meetings might be held and a motion was made and seconded that they be held the first and third Mondays of each month and a double postal card notice be sent to all members ten days in advance together with a notice to the chairman of the Green committee at the club where the meeting would be held. A committee was appointed consisting of Mr. Shraeder, D. W. Danley and Mr. Fred Ingwersen, who are to make arrangements for all future meetings. It was suggested that two or more clubs be visited during a meeting and the courses investigated by the visiting members. This would be followed by a constructive report of the greens made to the Greenkeeper of the club.

Dr. Seaman, chief chemist for Swift & Co. then addressed the meeting on Fertilization, Soil Acidity and Alcolidity. He stressed the fact that fertilizer tests should be made in various districts to determine the character of the soils. Dr. Seaman called attention to the various experiments being made along soil culture, among them the experiments of Professor Hopper of Purdue University on Nitrate of Ammonia with bent grasses which would probably be published this year, Dr. White of Penn State College on root development using Acid Phosphate. Dr. White's theory is that grasses require more phosphates than have been used hitherto and is working along the study of root feeding, etc. Dr. White's experiments lead him to report that the grasses in the past have not had a balanced food and the work of the greenkeepers in the future should be to plan a properly balanced grass food.

The Association has arranged with Dr. Seaman to obtain the reports of the experiments carried on by the