MARCH · 1967

USGA GREEN SECTION RECORD

A Publication on Turf Management
by the United States Golf Association

Green Section Award

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VOL. 4, No. 6 **MARCH 1967**

Cover Photo: Wm. Ward Foshay (left), President of the United States Golf Association, presents the USGA Green Section Award to Elmer J. Michael. See article on Page 15.

Published six times a year in January, March, May, July, September and November by the UNITED STATES GOLF ASSOCIATION, 40 EAST 38th ST., NEW YORK, N. Y. 10016. Subscription: $2 a year. Single copies: 35¢. Subscriptions and address changes should be sent to the above address. Articles, photographs, and correspondence relevant to published material should be addressed to: United States Golf Association Green Section, P.O. Box 567, Garden Grove, Calif. 92642. Second class postage paid at Rutherford, N. J. 07070. Office of Publication: 315 Railroad Avenue, East Rutherford, N. J. 07073.

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USGA Green Section Conference Issue

Subject:
Modernizing the Golf Course— Revision and Renovation

The material in this issue of the Green Section Record is a condensation of material presented at the Green Section's annual conference on golf course management in New York City. It is reproduced as a permanent record of the conference.

AT THE GREEN SECTION CONFERENCE

Top left—Signing in: Lee Record, Charles Mruk, John Zoller, Ed Reilly, Rudy Komasek. Right—Delegates listen attentively to one of the speakers.

Bottom left—At lunch: Richie Valentine, Lou Vay, Henry Indyk, Tony Biddle. Center—Warren Bidwell, Eb Steiniger, John A. Emich. Right—James L. Holmes, John P. English, Miss Carol McCue.

Why Renovate or Revise?

by DR. MARVIN H. FERGUSON

On almost every golf course some areas are inferior to the rest. They may be poorly designed or poorly located, but for some reason such areas are less easily maintained. At a time when both standards of excellence and maintenance costs are rising it is important to remove the causes of this maintenance difficulty.

Inasmuch as greens require proportionally more maintenance than the rest of the course and because they are of such great importance in the play of the game, they claim attention first. Renovation may be necessitated by the presence of an inferior grass, by the presence of thatch or by surface compaction. The trouble may be an excessive amount of weeds such as **Poa annua,** crabgrass, or chickweed. Such troubles may often be eliminated by reworking the surface.

More serious problems are associated with poor drainage and poor water infiltration. The causes of these ailments may be compact soils, layered soil profiles, or improper contours. Whatever the cause of poor drainage, the condition is seldom easy to correct.

Thus, the conditions that call for the revision and renovation of greens may also exist on other areas of the course. While poor drainage on fairways may be less critical than it is on greens, and while corrective measures will obviously not involve rebuilding, the task of effecting good drainage can become a rather large undertaking.

Revision attempts which go wrong are among the saddest experiences that one may witness. One recalls the willful green committee chairman whose business is road construction. He rebuilds greens at his club contrary to the wishes of other members of the committee. Their protests, however, are limited because the chairman uses his equipment and his workmen and does the job "at no expense to the club."

But, alas, the greens are completely unsatisfactory and the next year the club has to rebuild the greens again, this time at a substantial cost to the membership.

Another sad experience involved the use of an herbicide on dandelions in a bluegrass fairway. The sprayer was a borrowed one and the previous user had left a solution of soil sterilant in the tank. The turf was ruined and more than two years elapsed before it was possible to germinate enough grass seed to reestablish the stand.

It is important, therefore, that revisions and renovation programs be undertaken only after careful and thorough planning. On most golf courses some renovating activity is done almost every year. The object of such work is either to improve playing conditions or to ease maintenance. Careful evaluation of the problem and thorough planning can lead to the accomplishment of this aim.

Modernizing for Demands of the Game

by JOHN P. ENGLISH, Member, USGA Green Section Committee

Webster tells us that **to modernize** means **to adapt to modern needs, taste or usage.**

When we apply this title and Webster's definition to a golf course, we mean to revise or remodel that golf course to meet changing conditions. These changing conditions may affect the skill with which we play, our attitudes toward the game or the tribal customs which have grown up around the game.

I can remember a perfectly frightening number of changes in golfing conditions since we used to scoop our tees out of a sand bucket, since cross-bunkers were an accepted part of the game—and since our ladies played in skirts.

First and foremost, of course, has been the population explosion which has lifted this country from one of 62,000,000 at the turn of this century to one of nearly 200,000,000.

This has had two obvious and direct effects on golf courses.

It has brought the cities and the suburbs to our doorsteps, making it necessary for us

to fence our courses, in many cases. It has made us squeeze the utmost value from the land in redesigning courses.

And it brought us more players and more play than many of us can handle, requiring us to make provision to expedite play, to handle heavy traffic and to promote the safety of fellow-players. It has also made it more difficult to find time to maintain the course properly without interfering with play.

The increasing affluence of our society has brought with it not only more money with which to make our courses green and beautiful, but also demands that we produce perfect tees, fairways and greens every day all season, and that we make the game as easy as we can for the members. And, of course, suitable for the electric cart.

With affluence and leisure has come a quest for beauty. The men who sank tomato cans in an open field and played a gutty ball from can to can did not write letters to the Green Committee about the ugliness or untidiness of part of the "course." Now, however, the country club has become an American institution—and the member wants to be proud of its appearance as well as its quality as a golf course. And now, also, more ladies play and express their own ideas on how to make the course more attractive.

Finally, the tools of the game—the clubs and the ball—have changed. The championship course of father's day is a pitch-and-putt for his son; the bunker that caught Dad's drive isn't taken into account as Son plans his tee shot.

Each of these changing conditions does not require separate responses. We can codify a few basic objectives which, if programmed into our construction and maintenance schedules, can keep our courses abreast of the times. We over-look them at our peril.

These basic objectives should:

1. Protect property and the safety of the players.
2. Expedite play.
3. Increase visual beauty.
4. Simplify maintenance.

Under the first objective I would list:

1. Fencing the outer limits of the property where non-member traffic indicates and planting screening trees on other property lines—to keep undesirables and casual strollers out and to keep golf balls in.

2. Planting screening trees where they will discourage players from trying short cuts not intended in the design of the course—trees are much better than artificial boundaries, which are no protection against a wild shot anyway!

3. Check bridges and supports regularly.

4. Improve playing visibility wherever possible. Raise a tee, scalp a mound so that players ahead can be clearly seen, or install an overhead mirror or an "all clear" bell.

Under "expediting play" I would list:

1. Maintain roughs, woods, ponds and brooks so that balls will not be easily lost. One stroke is penalty enough for an errant drive; we do not have to exact the death penalty in normal, recreational play.

2. Eliminate bunkers which have outgrown their effectiveness against scratch players and which only delay the less skillful and slower players, who have trouble enough.

3. Build women's tees to fit the ability and strength of the average woman golfer. A women's tee should be placed so as to give average women players a second shot to the green of no greater difficulty for her than a man's is for him.

Under increasing visual beauty I would list:

1. Pay close attention to tidiness. Install waste containers. Instruct the crew to pick up debris and remove it. Be thoughtful of where you pile clippings and how often you dispose of them.

2. Blend the colors of plantings, flowering shrubs and trees, consider the use of rock facings on ugly unkempt banks. Use rock formations where they have natural beauty.

3. Prevent the scarring of banks and slopes by installing fences, paths and wood steps. Rustic fences have a natural beauty of their own even while they control traffic flow.

Under the fourth objective, simplifying maintenance, I would urge:

1. Building paths where people walk and where the carts roll, to avert scars and the effects of wear. This is especially necessary on slopes.

2. Re-grade and ramp slopes, if necessary, to make them safe and attractive for walking and driving. Above all, direct them away from aprons and greens.

3. Enlarge tees, especially at the short holes.

4. Drain wet areas.

5. Improve roads for moving equipment.

Preparing for a Championship

by M. G. MILLER, Green Committee Chairman, Baltusrol Golf Club, Springfield, N. J.

Planning for the 1967 United States Open Championship began in January, 1964, when the USGA accepted the invitation of Baltusrol Golf Club to be the host club.

The first step was the selection of a General Chairman, and, in turn, the three Vice-Chairmen and the Chairmen of the various committees. Then followed the appointment of the members of the 22 committees, such as promotion, tickets, parking, gallery, scoring and grounds, and outlining their respective responsibilities. About 225 male members and nearly the same number of the women are on the committees.

The second step was to find out what jobs had to be done. The position was similar to that of the youngster in French class. Asked how the work was coming, the youngster replied: "In most classes I have trouble with the answers, but here I can't even understand the questions."

Fortunately, the Baltusrol committees had an opportunity to observe the arrangements at Congressional Country Club, Washington, D.C.; Bellerive Country Club, St. Louis; and Olympic Country Club, San Francisco, host clubs at the three previous Opens.

After these observations, the committee divided the preparation of the course into 14 parts, as follows:

Grounds

Baltusrol is endeavoring to provide playing conditions as nearly perfect as possible: to provide a course of tees, fairways, bunkers, and greens, where every shot can be made under fair and favorable conditions.

But the extreme drought of the last five years left its mark, particularly on the sides of the bunkers which could not be irrigated. This condition resulted in a plan to undertake quite an extensive program of bunker renovation. Also, Baltusrol initiated an intensive program of thatching and aerating greens in the fall of 1965, and of fertilizing the fairways and adjacent rough in 1965 and 1966.

Tees

The only change which the USGA suggested for the entire course was the construction of a new tee for the seventh hole. Ordinarily, the seventh plays as a par-5 of 490 yards and there are two good tees for this hole. However, USGA representatives decided that it would be a better test of golf played as a par-4 of 470 yards, requiring a drive over the bunkers on the right side of the fairway. Consequently, one of the tees was extended forward about 30 yards to achieve this and accent the dog-leg character of the hole. One other change has been made in the par. The 469-yard first hole will be rated as a par-4; club members play it as a par-5. Thus, the course will have a par of 70 and will play at 7,022 yards.

The committee decided that another tee on the 16th would improve this hole. It ordinarily plays at either 174 or 200 yards, but the removal of a defective pine tree permitted the construction of a new rear tee. The hole now plays at a challenging 214 yards to an island green within encircling bunkers.

Five of the tees which extend the course to 7,022 yards for championships are rarely played by the members and they were not in as good condition as the others. The best way to restore them was through resodding from the Baltusrol nursery. This program was completed last year.

Fairways

Ordinarily, the fairways are cut to about 5/8 inch and the bordering rough to about two inches. Some fairways are quite wide, but for this Championship they probably will be narrowed to about 35 to 40 yards at the drive zone by allowing the grass to grow to the two-inch to four-inch height desired for the rough. The USGA will delineate the fairway boundaries in April so that a cutting program will achieve the desired results by early June.

Staking Hazards

A lake at the fourth hole and brooks crossing or bordering several others call for staking several water hazards and lateral hazards. No out-of-bounds staking is necessary, but a fence on parts of six holes marks the boundary. Of course appropriate staking will be required at any "ground under repair" condition.

Bridges

There are about 20 locations where small bridges cross brooks. These have been satis-

factory for normal use, but when studied from the standpoint of heavy play and 25,000 spectators a day, many appeared unsatisfactory if not unsafe. Consequently, a number of the plank crossings were rebuilt and others were replaced with concrete pipe.

Shelters

For the last several years the occasions when players had to seek shelter from the rain have been so very rare that the shelters were almost forgotten. Normal wear, together with the thoughtlessness of some boys who last winter removed shingles and board siding to build fires while they skated on the lakes, left some of these in sorry condition. All of the shelters have been rebuilt and repainted.

Tents

The number of tents required to house necessary services during an Open is unbelievably large. To determine what was needed, each committee was asked to list the number, size and type it required. About 18 to 20 are needed, exclusive of those of the food concessionaires, who supply their own. The largest is the one for the working press. It is to house 225 men with typewriters on desks, an interview room where the writers may question the players, a Western Union facility, a scoreboard, and two darkrooms. This tent will be 90' x 120' and will have a wooden floor. The club provides the typewriters and desks.

One other large tent is needed for additional clubhouse-type dining facilities, since space in the clubhouse is not adequate. This tent will accommodate about 200 persons who will be served by a caterer. A similar facility will be installed in a large equipment barn, which is well out on the course and readily accessible to a large number of spectators.

Approximately 15 additional tents of various sizes will serve particular functions, such as for the starter at No. 1 tee, for public information, for medical and first aid headquarters, for scorers, caddies, marshals, transportation, security forces, and others. They will be located most advantageously for their respective functions near the clubhouse and at various other spots around the course.

Sanitary Facilities

Provision of an adequate number of temporary sanitary facilities at proper locations is necessary because normal facilities are woefully inadequate for such crowds. About 70 individual portable units are being rented and they will be located in multiples in identifiable but inconspicuous spots as much as possible.

Parking and Traffic

Parking 10,000 to 12,000 cars daily develops into quite a problem at a course that has two parking lots which are large enough only for members who normally use the club. A large field which was used for parking when the Open was last held at Baltusrol in 1954 now is a residential development. Additional areas are being designated on all available space and it is expected to use the rough and 14 of the 18 fairways of the Upper Course for parking. Fences will be installed to mark the areas and protect the greens and tees. Because direction of traffic and parking the cars is a specialized function, it will be handled by a concessionaire who has the necessary special skills. The concessionaire will collect the parking fee at the entrance gate, direct the traffic, and provide area attendants and tow truck service. All this will be under the overall direction of our committees.

Roads

Service roads throughout the two courses are limited but adequate for ordinary golf course operation and maintenance. However, the coarse crushed stone surfaces are not suitable for parking and the other traffic that probably will be imposed on them during this week. They may be improved by adding a smaller screen crushed stone and a suitable bituminous binder to hold the stone in place. This could reduce dust resulting from the increased traffic.

Fencing

The direction of traffic, the delineation of parking areas, and the protection of greens and tees not involved in the Championship call for the use of fencing. Several kinds were considered, but the four-foot high snow fence seems most suitable. It is being rented from a highway authority. At least 15,000 lineal feet, and possibly 20,000 feet, is required. It is a sizeable job to obtain, erect immediately before the Championship so as to limit interference to use of the course, and to remove when play has ended.

Also, some additional club boundary fencing is required. While a large part of the club's 540 acres is enclosed with a six foot high chain link fence, about 1⅓ miles is not protected. One mile of this is in a heavily wooded area bounded

by a stone quarry and a fence is not required there. But additional fence will be installed for protection and privacy along the ⅓ mile alongside a public highway. Fencing of this section previously has been desirable but not necessary; now it is required for the control of admissions.

Water for Lakes

A lake on the fourth hole constitutes a beauty spot and makes this 194-yard hole challenging, since the lake extends to the edge of the green. This lake is fed by a spring and in recent summers the level has dropped occasionally because of both the drought and leaks resulting from an occasional incursion of muskrats. The job here has been to curb the animals and to plug all possible leaks while hoping that rains will be adequate.

Spectator Ropes

Roping entire fairways from tee to green was an innovation at Baltusrol for the 1954 Open Championship. This practice proved so satisfactory that the USGA purchased the rope and used the system at all subsequent Open Championships. Baltusrol will be roped again. The club has outlined procedures for driving metal stakes and for stringing about 42,000 feet of rope. Special crossing signs will be erected at designated points where the gallery is permitted to cross the fairways. All this work must be done in the last few days preceding the practice days so that the stakes will not interfere with mowing operations.

Trash

It is an old American custom to discard paper and other refuse at the immediate point where it becomes useless. Baltusrol will try to encourage the spectators to deposit such trash in 250 containers which will be located strategically around the course. These containers will hold plastic bag liners for easy handling. However, recognizing that some people may be careless, it will be necessary to employ a clean-up squad to cover the entire course and collect the scattered refuse. The cleanup and collection from the containers must be accomplished each evening after play has ended.

Several additional activities are necessary in preparing for an event as important as the Open:

1. Arrangements must be made to supply electric power to several locations for the concessionaire, caterer and television.
2. Security forces must protect the course 24 hours a day before and during the Championship.
3. Additional lines and cables for communications and television must be placed.
4. Platforms or towers at six locations for photographers must be erected.
5. The clothing size of the workers who will be raking traps and doing other work on the course must be estimated so that they will be suitably garbed.

Conclusion

Preparing for a championship entails more than providing a good golf course. Initially, Baltusrol had about 40 months to do the job. Most of that time was used to study the needs, plan, make arrangements and schedule—and now only a short time is left in which to complete the many things that must be done. The Open is played in four days; it took more than three years to get ready.

Selling the Idea

by E. L. MEISTER, JR., Green Committee Chairman, Kirtland Country Club, Willoughby, Ohio

Golf course changes or innovations, if they are to be digested easily and without criticism by the membership, must start many years in advance of the actual work.

First, it is important that the chairman of the green committee be someone conversant with golf and who has the confidence of the membership. If the green committee chairman has a reputation as a fine competitive golfer, changes in golf course design will be accepted more easily. Changes also must be practical and worth doing. It is important to establish a long-range plan for the development of the course. This plan should be implemented by a golf architect, who can present his proposals and suggestions in written form. The membership will accept recommendations of this type much more easily than those coming from other members or from green chairmen.

At Kirkland Country Club it was obvious that certain changes had to be made in the golf course to bring it up-to-date. The club employed

a well-known golf architect to prepare a plan. It wasn't very difficult to sell the membership on his plan, which would require several years to complete. In the case of Kirtland, the fact that I, the green committee chairman, was a member of the Walker Cup Team helped to sell the idea to the membership. My suggestions and thoughts on the necessity for improving the golf course were readily approved and accepted. It is extremely important to have the right person as chairman of the green committee. If he does not play golf well, or is not particularly interested in golf, he won't sell a plan of modernization very effectively. Likewise, he probably won't be interested in bringing the golf course up to modern standards. Thus, the selection of a green chairman and the development of a long-range plan are extremely important.

Obviously, the membership of every club is different, and different approaches are necessary at each club. When members understand the changes and why they are being made, there is little opposition. A bit of psychology might be useful. When a member says the golf course is in great shape, reply that, yes, it is not a bit bad, but it could be a lot better. Generally the member will quickly reply, "What do you mean? This is one of the greatest courses in the country and it is in better shape than any course I have ever played." Occasionally someone will say the golf course is in fine shape, but then he'll find something to criticize. Should a member criticize some feature of the course, try agreeing with him. By agreeing with him on the basis that, yes, you are right, the greens are terrible or the fairways are frightful, you might find his reaction rather interesting. He'll probably say, "The greens aren't that bad," or, "The fairways aren't that bad. Actually, they are pretty good." After a few minutes, the complaining member could well be defending instead of criticizing.

It is good practice to write each year to the membership, explaining the changes so that they are not surprised to find the work crew building a new bunker, a lake, or a new green. In other words, it is extremely important to communicate with the membership so that they know what is happening.

Most members instinctively feel that changes will make the course harder to play and, therefore, less enjoyable for them. However, improvements often make a course easier to play and more enjoyable for the member. Some clubs suggest one basic rule: make the course hard for the good player and relatively easy for the average or poor golfer. This at first glance may seem impossible to do, but in fact, it is not. The positioning of fairway bunkers, the positioning of green bunkers can make a course extremely difficult for the good player and not change the difficulty for the average player. Trees can be positioned for the same purpose. Thus, this objective can be realized for the benefit of all the members.

When to schedule major improvements is another important factor. Usually they are started in the fall or just after Labor Day. This allows enough time for the changes to be completed before the first snowfall. If they are clearly informed of the improvement program, members of Kirtland Country Club don't offer much opposition. Obviously, you cannot disrupt play. But if you make allowance, (for example, a temporary green) members accept this inconvenience without complaint so long as they understand the problem.

The development of flowering shrubs and trees is one phase of modernization and construction that seems to have been forgotten. Azaleas, rhododendrons, dogwoods, and other flowering trees are profusely planted on the Augusta National Golf Club's course. Kirtland follows the same plan and each year plants over 100 dogwoods, rhododendrons, flowering crabs, and other showy ornamentals. Members enjoy seeing beautiful shrubs and trees about their course, and a great many golf courses could be improved in this area.

Naturally, problems occur. It is not all easy sailing by any means, but then not everything worthwhile is easy to do, or always fun. It's impossible to emphasize too much the cooperation necessary between the green chairman and the superintendent. In this respect, Kirtland offers an incentive program to the course workers. The club allocates $500 to the man who has the best greens during the summer and $300 to the man with the second best. This not only includes the greens themselves, but trees and bunkers adjacent to the greens. It is amazing the interest the green crew has taken and the fun the members have had from this program. Likewise, the green crew plays the course at least once every two weeks. This has been helpful because they can find many things they would correct and many good suggestions come from them. The cooperation of all hands is essential to golf course conditioning and modernization.

The back of the fourth green at Eugene Country Club. A slide of this view was shown and is referred to on the opposite page.

Eugene's Novel Approach

The following article was presented at the USGA Green Section Conference as the script to a series of color slides. The script was written and the slides prepared to show at the Eugene (Ore.) Golf and Country Club as a novel method of encouraging the members to agree to remodelling the course. It was shown at the Conference by John Zoller, the Eugene Golf and Country Club's Course Superintendent.

The script was recorded and it should be remembered that a view of the course was on the screen at all times during the presentation. Space does not permit all the slides to be reproduced within this article.

It is published here merely to demonstrate a method one club used to stimulate remodelling.

In 1924 the Eugene Golf and Country Club was developed in the present location. The wise selection of site by those who put forth the capital and the work to establish the club has resulted in one noted for its natural beauty, and particularly enjoyed for its proximity to the center of the community. Over the years the club has been enjoyed both by its members and visitors from throughout the country.

Membership has grown until there is nearly always a substantial waiting list with membership maintained at 550 members. Not only does the Eugene Golf and Country Club have a full membership, most of whom enjoy playing the very fine course, but each member's family participates to a great degree.

The expansion of the women's program and the junior golf program in recent years points up the fact that golf is now a full family recreation. This is a tremendous change from the time when the club was founded and the male member alone enjoyed the golf course. Though this increase in play is encouraged, it does cause a number of problems.

At the time the Eugene Golf and Country Club was founded, courses were designed to handle approximately 1,200 rounds of golf monthly. Recently totals indicate that play has

risen to almost 6,000 rounds per month in peak months. The heavy play on greens and tees now over 40 years of age at five times the design level has caused excessive wear and a multitude of maintenance problems.

This high rate of play, along with the problems caused by the aging and compacting of the turf, caused your board nearly two years ago to start an evaluation of the condition of our golf course. It should be pointed out here that the basic responsibility of your board is not only to maintain the course and facilities in the best possible condition today, but to look ahead to tomorrow so as to protect the capital and recreational investment each of you has in the club.

To proceed, your board first sought the opinion of your own golf course superintendent, John Zoller, and secured his thoughts concerning the condition of the course and its future. Additionally, the matter was discussed with Wendell Wood, your professional of long standing and one fully familiar with the course. These views added to those of the green committee indicated that a problem existed and caused your board to seek experts knowledgeable in the field of golf courses, soils and grasses. William Bengeyfield, of the United States Golf Association's Green Section, was asked to visit the course and give his opinion as to whether a problem existed.

Perhaps some of you came to the membership meeting where Mr. Bengeyfield both expressed his viewpoints and answered many questions posed by those present.

At this point and after carefully evaluating the opinions of Mr. Zoller, Mr. Wood and Mr. Bengeyfield, the board concluded that a problem did exist and sought suggestions for solution. Perhaps this is the place to be a bit more specific concerning some of the problems. As an example you now see a drawing of the third green. The problems concerning this green are typical of those that exist on the majority of our greens. The green has a total area of only 3,000 square feet. Of this total, only 30 by 20 feet, or 600 square feet is usable space for cup placement when the cup is placed the recommended distance of not less than 15 feet from the edge of the green. This places all the wear, all the walking, all the cup placement in a very confined area.

Naturally this causes extreme wear, particularly during the heavy play of summer months, and further compacts already compacted turf. The area around the green in the approach area and the bunkers on either side are not tiled properly. This causes these areas to drain poorly both summer and winter and reduces playability.

The area shown on this slide indicates the places surrounding the green that require slow and costly handwork, adding to the annual maintenance costs.

On other greens these problem areas are even greater. For instance the back sides of seven, the back of four, the back of 11, 14, 15 and 16 are examples of where old designs cause great amounts of hand labor, and, coincidentally, where the penalty for a slightly missed shot that goes over the green is extreme.

Impossible to show adequately is the condition of the grasses. As years have passed, the original grasses have been replaced by native grasses. These lack uniformity, are hard to maintain, recover slowly from the rigors of increasing play and are not good for use as greens. Greens built today under modern USGA standards eliminate the problems shown here. As mentioned, the third green is used only as an illustration . . . these problems and some similar and even greater are existent on every green on the course.

First a Canadian architect was contacted. He spent time going over the course and concurred with the opinions expressed by the others. Contact was then made with an American golf course architect. This man was retained by the board to study the course and to formulate plans for revision and modernization. The architect and his staff have since visited the course on a number of occasions and have presented a plan of modification that your board feels is workable and offers a solution to the problems at hand.

This is the background, the problems, the study by the board, the actions of the board, and now concluding with what is felt to be a feasible solution. It should be noted here that these conclusions have been arrived at after careful consideration. Committees, particularly the green committee, have worked in review of the entire situation. For a period of time your board met weekly to be certain that the proposed action is necessary and that it is a reasonable and proper solution. And your board had voted unanimously to recommend to you the following:

To follow the plan suggested by the architect for the development of 18 new greens and tees. He recommends that this be done through reversal of the golf course from tee to green.

Approach to the 15th green; what would you do with it?

His study of the course indicates that this is one of the few courses in the country that lends itself to this method of modification. This plan will enable almost uninterrupted play on all 18 holes during the period of renovation, keeping club revenues at approximately a normal level during the time of construction.

Another important reason for favorable consideration of this plan is to make better use of our land, recovery of four acres or more of land valued at $25,000 per acre, more parking areas and a better location for the golf shop and practice facilities. The architect feels that all work can be confined in the period of a few months time with an entirely new and better Eugene Golf and Country Club available for full play in less than a year's time.

The natural beauty of the course will be retained with protection of the trees with which the course is endowed. Better use will be made of our terrain and water. And important to many, the redesign will in no way be an effort to develop the course to what some refer to as a championship course.

Many changes will be in favor of the higher handicappers and the lady golfers. In fact, some golf course architects feel that the course now favors the low handicapper and puts the higher handicapper and the lady golfers at severe disadvantage.

What does re-design mean? As an example, here are slides that give some indication of work done on golf courses.

[Editor's note: A series of slides followed showing courses from the Northwest and other areas. The descriptions were designed to show what can be accomplished through remodelling. A few comments follow.]

The par 3, No. 12 at Spyglass Hill illustrating the design character possible in the Par 3 holes proposed at Eugene. The green, integrally designed with a lake on the left plus the flexibility of five tiered tees, offers a multitude of variety and challenge to all classes of golfers.

A green at the Peachtree course showing a setting similar to that envisioned at Eugene in relation to bunkers, trees, and green surface. The generous-size green improves the overall aesthetics, offers a large target, and provides for easier maintenance.

This rolling green at Incline Village on Lake Tahoe is larger than those proposed at Eugene, but, nevertheless, illustrates the many pin areas possible allowing great flexibility to each hole and ease of maintenance. Wear and tear can be distributed over larger area.

The small green in the foreground is actually a temporary one used to accommodate daily play during remodeling on this course. Nevertheless, illustrated here is the old style small flat green, where little flexibility and considerable heavy wear make for difficult maintenance. In contrast, note the many pin areas available for variety of difficulty on the new green and also much less concentrated wear.

Re-design will mean new and more modern bunkers, completely new greens and larger elevated tees. The greens will be developed from the ground up allowing better year-around play with better grasses and consistent putting the

year around. Larger greens will be developed to meet the requirements of today's intense play. Drainage of the entire green bunkers included to provide better play both winter and summer. And another point to be considered is the protection of your investment, the keeping of your course modern in design and in excellence of playing quality. It is almost certain that in the near future a course offering fine facilities and with full modern design will be in the area. When that time comes it is in your interest that the Eugene Golf and Country Club be capable of competing in every way and coming out as the finest course, THE course in Eugene, Oregon.

Perhaps the starting point of all the considerations was the realization that something had to be done about the sprinkling system. It has been known for a number of years that replacement of the present outdated system was necessary. Each year substantial repairs have to be made and each summer the inadequacy of the present system becomes more apparent.

The present system is what is called a single line system featuring a row of manually operated sprinklers running down the middle of each fairway. Each sprinkler covers a circle with a radius of 60 feet. Some areas along the edge of the rough are missed, some get single coverage and some double coverage. This results in dry areas, a few that are just right, and as many of you have found, areas down the middle of the fairways with too much water. This system also results in the use of large amounts of hand labor in order to keep the course in playable condition.

After study and review of available systems it is recommended that in addition to modernization of the golf course that a completely new sprinkler system be installed.

A two line system uses a far greater number of sprinklers, each covering a smaller area than the present system, but the combination gives better and more even coverage of the course. This system is automatic and reduces the labor necessary in the present operation. Better playing conditions will exist over the entire course.

These are the recommendations of your board. These conclusions were arrived at after careful study. Experts were consulted, their opinions evaluated and considered by committees. Discussion, consideration and review have all preceeded recommendation. Your board feels that these conclusions have been reached with your best interest in mind.

One more step probably of interest to you is how much money will it cost and how do we pay for it. Closest possible estimates indicated that to accomplish these goals it will be necessary to spend $485,000 for the complete modification of the golf course, the moving of the pro shop and for the new sprinkling system. Now that's a lot of money, but when placed on a pay-as-you-play plan, this total financing can be accomplished for a dues increase of $7.80 monthly. Financing can be accomplished by borrowing the money over a period of 15 years. This amount includes the balance on our present mortgage along with sufficient funds to finance golf course modernization.

For just $7.80 per month you can enjoy one of America's finest golf courses in the fall of 1967, yet play on the present course during construction. In conclusion, recall that your board recommends this by unanimous vote.

It is felt that these are the things that will be accomplished by your affirmative action.

1. Replacement of greens that are too small by those of adequate size, of modern design, and capable of meeting the requirement of today's play rate.

2. Greens that are not compacted, but greens with better drainage, offering more enjoyable year around play.

3. Greens built to last for years to come with uniform turf, uniformity in putting.

4. Tees—modern, larger and more level with special attention to teeing areas for the lady golfers.

5. A golf course designed for better playing enjoyment by all members regardless of handicap.

6. A golf course designed by one of the foremost golf course architects in the world.

7. Better use of our land with more adequate parking areas. Securing the use of four acres of land worth $100,000.

8. Re-location of the pro shop adjacent to the clubhouse and practice area.

9. Finally, development of a modern golf course capable of competing with any golf course to be built in or around Eugene in the years to come.

These are the reasons that motivated board action. For a greater Eugene Golf and Country Club tomorrow your board recommends adoption of this plan tonight.

Renovation vs. Rebuilding Greens

by HOLMAN M. GRIFFIN, Agronomist, USGA Green Section

Most golf courses are in a constant state of change as club officials try to keep pace with changing conditions. Some of the main reasons for change are:

1. To improve turfgrass and playing conditions.
2. To reduce maintenance costs.
3. To overcome wear caused by increased play.
4. Fundamental weaknesses in construction.
5. Pride in membership, which generates the desire to have the best possible golf course.

With so many reasons to change a golf course the problem becomes one of how best to accomplish the revision. Since golf greens are the most complicated and expensive part of the course, the most difficult problems usually revolve around them. Probably the question most often encountered is whether to rebuild or to renovate.

For clarification, the terms "rebuilding" and "renovation" should be defined. Rebuilding means to start from the beginning and build as if no green had existed there before. Renovation means to restore, to renew, to make over or repair. When applied to a golf green, it is sometimes rather difficult to draw a line between the two, but for our purposes we will use rebuilding to denote complete change and renovation to mean repair.

The question of whether to rebuild or renovate can best be answered by stating an analogy between maintaining an automobile and maintaining a golf green.

If you wreck your car, have an old model lacking modern features, or if your car is in poor repair, you decide whether it is best to repair the old one or to buy a new model. Your decision is based primarily on economic considerations and personal preference. The same kind of decision has to be made on a golf green when it becomes undesirable for play.

A bent fender or a lack of air conditioning, for instance, does not necessarily call for buying a new car because these items can be repaired or added. However, if you have a sports car and you need a station wagon, you change cars.

When we speak of golf greens, design errors or obsolescence can usually be remedied only by rebuilding; agronomic faults leave us with the choice of whether to rebuild or to renovate.

The decision to rebuild or renovate ultimately should be based on the nature of the problem. You must weigh carefully the chances of satisfactorily resolving the problem by modification against the merits of total renewal. Determine how serious is the problem, which method of correction is least expensive, and which method gives the best chance for lasting improvement. The opinion and advice of someone well versed in agronomic principles will best answer these questions. If design is at fault, a competent architect could help correct it. A good golf green comes from blending sound agronomic features with good architecture.

Because of the variety of circumstances under which the decision to rebuild or renovate may be faced, it is very unlikely that any unyielding rules will apply in all cases. Probably the only factors with any real bearing on the final decision are an accurate cost estimate and a determination of which method will cause the least inconvenience to golfers.

Modification is usually easier and less expensive, but it entails a lot of guesswork and has definite limitations. When the putting surface has to be removed to modify the soil underneath, this is sufficient reason seriously to consider rebuilding.

However, rebuilding does not of itself assure success; it has to be done properly. Several clubs rebuilt greens only to find that the new greens were worse than the old.

To be certain of sound construction, at least from an agronomic standpoint, follow the method advocated by the Green Section since 1960. This method virtually eliminates the chance of agronomic faults if it is properly employed.

Some club officials spend extra money each year trying to renovate a problem green. Then after suffering for several years, they decide the green has to be rebuilt. Not all clubs or greens fall into this class, but there are a lot more than there should be.

This doesn't mean that renovation attempts are never justified, because that depends entirely on the particular problem that must be solved.

Another reason that rebuilding could be better and more economical in the long run is that it is impossible to obtain as good a soil mix by blending on the site with a tiller or disc as it is by mixing the components away from the site and placing them on the green.

Maybe some day someone will devise a foolproof method of renovation, but until then the process will be strictly guesswork and should be considered in its proper place as second best to a good rebuilding job when significant problems are involved.

Any of our present methods of renovation which attempt to modify a green below depths of one inch should be taken under advisement. Be sure that members will get the most for their money and that any changes fit into the long range plan of improvements.

Putting Green Construction

by JAMES L. HOLMES, Agronomist, USGA Green Section

In 1960 the USGA Green Section published the article: "Specifications for a Method of Putting Green Construction." This is a laboratory-proven method of construction that is known to have the following characteristics even after soil compaction:

1. A known and relatively constant water infiltration rate.
2. A known and relatively constant water permeability rate.
3. A predetermined amount of air or void in the soil mix.
4. That amount of void which will contain air balanced against that amount of void which will contain water when the soil mix is at field capacity.

A perched water table phenomenon described in the specifications becomes of paramount importance when greens are built in this manner. Thus, if attempts are made to build greens following this method, instructions must be followed **exactly.** In order to keep infiltration and percolation rates within prescribed limits and to arrive at a suitable air-water relationship at field capacity, it has been proven necessary to use a relatively large percentage of coarse material such as sand in preparing the putting green soil mix. This is especially true in dealing with soil high in content of silt, clay, or organic matter.

One or more greens built according to Green Section specifications have been installed at many golf courses. Usually when a club decides to build one green according to these specifications, it is built in the poorest possible location and where a history of failures exists. Invariably this new green holds up better and then clubs frequently rebuild all their greens to these specifications.

Of foremost consideration is the fact that greens built by this method can be played immediately after a heavy rain or even after a green has been mistakenly watered to excess. With increasing traffic on putting greens, this characteristic becomes ever more important. Greens which do not contain adequate internal drainage are seriously damaged if play is allowed when soil is saturated. If for nothing else, a method of putting green construction which allows play immediately after saturation is of considerable help.

Previous Methods

The traditional method of building greens was to form general contours with existing soil, then spread sufficient sand and organic matter (humus or peat moss) so that a mixture of approximately ⅓ native soil—⅓ sand—⅓ organic matter (or 1-1-1 ratio) is present to a depth of eight to 10 inches after mixing. Numerous mixing procedures are followed, such as plowing, discing, rototilling and shoveling. Such greens have presented suitable putting surfaces for 60 years or more, especially where surface drainage has been adequate.

No doubt a majority of greens in the United States were constructed in this manner. However, the demand on greens is increasing steadily. Golfers insist on playing at any and

all times, following heavy rains or at times when greens built to the 1-1-1 ratio are completely saturated. Often permanent damage results.

Not only has the 1-1-1 ratio been in use for a number of years, but many courses have used only native soil in making greens. Greens made from native soil have held up quite well, but the most satisfactory results are obtained only if rapid surface drainage is assured.

Using these methods today it would be necessary to construct very large greens simply to assure adequate space to place cups. If large and numerous cup placement areas are not available, turf is worn out, especially when play is heavy and soil is saturated. With greens in excess of 15,000 square feet it is not always possible to obtain adequate surface drainage; at least this requirement is not always built in.

In addition to the 1-1-1 consistency and native soil construction, a few are constructed on almost pure sand, and occasionally simply by mixing sand with organic matter. Greens built this way have held up well, resulting in years of trouble-free play. All this emphasizes that greens have a better chance to survive if excess moisture can be removed from the soil.

What's Happening Now

Controversy exists and misinformation abounds in the green construction field today. Many builders and architects have given the Green Section's specifications a cursory reading and have decided that certain steps are not really necessary, or that such construction is too costly or too troublesome.

Quite often soil tests are not made and other short cuts are attempted. Tile is not installed as specified, the amount of gravel is reduced, or the builder decides that 10 to 12 inches of topsoil mix after settling is not required. Others have decided that too much sand is being used in the topsoil mix. They guess that a mixture which contains between 50 percent and 65 per cent is suitable.

It has been found repeatedly that when this amount of sand is mixed primarily with a silt-clay loam, a superb grade of concrete or adobe results. It seems impossible to arrive at a poorer soil mix. After this mix has been in place for less than a year, frequently it is impossible to probe to a depth of two inches. Within the first year, superintendents are either rebuilding these greens or are involved in major renovation to improve drainage.

For some reason it is difficult to get across the idea of the perched water table phenomenon. This is of absolute importance if greens are to be built according to Green Section specifications. Most people believe that if gravel is placed under a soil of any type, drainage will be assured. It won't.

To explain, it is necessary to understand the principle of capillary attraction. Water is attracted to itself as well as to many other things. Water will envelope and be attracted to soil particle surfaces and interfaces. Thus, the smaller the pore spaces in a soil, the greater the adhesive force exerted and the more tenaciously water is held.

Not only is the size of the individual pore important, but so is the total pore space contained in a given soil mixture. Pure sand contains relatively large pore spaces and, therefore, will drain readily. As fine soils (silt and clay) are mixed with sand, they fill the larger pore spaces between sand particles. When this occurs, extremely fine pore spaces develop and a highly effective natural sponge results.

If gravel or any material which has larger pore spaces is placed beneath this fine soil mixture, capillary attraction is much greater in the fine soils above. Consequently, it is impossible for water to drain naturally from the fine soils into the gravel. The perched water table that develops from this mixture is more or less permanent, and this can be disasterous to growing turf.

However, if soil components are properly tested, a mixture can be prepared whereby the perched water table phenomenon would exert a sufficient water-holding force so that half the water held in the mixture is contained in larger voids. This will drain by gravitational pull coupled with column tension when the mixture approaches saturation.

Controversy continues over the necessity of drain tile. Here again, if those involved would simply develop an understanding of water-holding capacity of the soil mix with which they are dealing, it is a simple matter to determine whether tile will work. If many fine pore spaces are present, this soil has a great attraction for water. A tile is simply a large void with absolutely no attraction for water other than through gravity. Thus, if the soil surrounding the tile is a strong enough sponge and has a great enough attraction for water, it is impossible for water to enter the tile, especially a shallowly placed tile.

On the other hand, if the soil mixture surrounding the tile does not have a great attraction for water, and if a sufficient quantity of water is present, water will move by force of gravity into the tile.

Once water starts into the tile, column tension comes into play. A quantity of water which exceeds the amount which would normally drain due to gravitational pull, then enters the tile. This leads to the theory that tile pulls water. However, it is really water pulling water. The question of whether tile is necessary depends entirely upon the soil with which you are dealing.

It is of absolute, prime and controlling importance that adequate surface drainage be built into any green. It is especially necessary in those where guess-work, and not specified procedures, is being followed.

Checking into other methods of construction for putting greens is continuing with emphasis on hydroponics or sub-surface irrigation, as well as on incorporating synthetic materials. It would seem, as our current knowledge indicates, that water and air relationships with regard to turf and the demands of the golfer are key factors. These are being explored to the greatest extent. We should not overlook the possibility to employ complete synthetic materials such as those used in the Astrodome in Houston, Texas, in areas of heavy use.

Even though significant break-throughs have been made with regard to green construction, it goes without saying that improvement will be made in this area and that new ideas and practices will be forthcoming in time.

Green Section Award

Elmer J. Michael of Pittsford, N.Y., was named recipient of the United States Golf Association Green Section Award, presented for distinguished service to golf through work with turfgrass. Mr. Michael was Golf Course Superintendent at the Oak Hill Country Club, Rochester, N.Y., from 1929 until his retirement in 1965.

The award was presented by Wm. Ward Foshay, of New York, USGA President, and Henry H. Russell, of Miami Beach, Chairman of the Green Section Committee.

Mr. Michael began his career in 1918 as an assistant to his father at the Park Club of Buffalo, N.Y., which was built on the site of the Pan-American Exposition. A few years later Walter J. Travis redesigned the city course and, at the age of 22, Mr. Michael was put in charge of construction. He supervised the work of 40 men. He remained at this course until 1925, and from there went to Transit Valley Country Club, East Amherst, N.Y., until he moved to Oak Hill.

Mr. Michael was among the earliest superintendents to recognize the value of creeping bentgrasses for putting greens. He planted the East Course at Oak Hill to a strain of bentgrass that he discovered on grass plots that were abandoned after the Pan-American Exposition.

He also designed and installed an irrigation system for both the East and the West Courses at Oak Hill.

Mr. Michael trained numerous men who are now working as golf course superintendents throughout the country.

He is a member of the USGA Green Section Committee and of several turfgrass organizations, including the Finger Lakes Golf Course Superintendents Association and the Golf Course Superintendents Association of America. He served as Mayor of Pittsford from 1956 until 1960 with no interruption to his duties at Oak Hill. He is a past President of the Pittsford Rotary Club and an Elder in the Pittsford Presbyterian Church.

Mr. Michael is the seventh recipient of the Green Section Award. Previous winners were Dr. John Monteith, Jr., of Colorado Springs, Colo.; Professor Lawrence S. Dickinson, of Amherst, Mass.; O. J. Noer, Milwaukee, Wis.; Joseph Valentine, Ardmore, Pa.; Dr. Glenn W. Burton, of Tifton, Ga., and Professor H. Burton Musser, of State College, Pa.

Poa Annua — Jekyll or Hyde?

by ALEXANDER M. RADKO, Director, Eastern Region, USGA Green Section

Poa annua is no less a subject of controversy today than it was 30 years ago. It has been a topic for discussion at turfgrass conferences at the national, state, and local level for years. Today even the casual golf televiewer soon learns that "po-annie grass" is something to dislike, something to be on guard against!

What is **Poa annua?** It is a member of the bluegrass family, the same family that gives us Merion Kentucky bluegrass, **Poa Trivialis** (a handsome grass suited to moist shaded conditions), and other Kentucky bluegrass common and select types.

Unlike these, **Poa annua** is classified as an annual plant, yet few will argue about its perennial qualities. **Poa annua** is an upright grower, it grows in individual clones, yet researchers say that some selections produce runners the same as creeping bentgrasses. **Poa annua** is classified as a cool-season grass that does best in the northern climates, yet it is found growing in areas of the Deep South!

How did it get to be a problem? In the early days quality fairway seed included a mixture of bentgrass, Kentucky bluegrass, and creeping red fescue. It was reasoned that a "shotgun" mixture such as this would satisfy all situations of soil and topography, and those strains suited to a particular ecology would evolve and persist.

These mixtures suited the general requirement very well over the years. Not until irrigation and closely clipped fairways were introduced did the weaknesses of this combination turf became apparent. Those who began to mow closer than 1½ inches found that the creeping red fescue and the Kentucky bluegrass weakened badly; those who watered and fertilized heavily found that the creeping red fescue died; those who watered and mowed high to keep the bluegrass and fescue found that the bentgrasses became too puffy and too soft to support the golf ball.

As these weaknesses persisted, it seemed that members demanded closer mowing, and this favored the bentgrass at the expense of the other two grasses. As the bluegrass and fescue weakened, **Poa annua,** apparently a contaminant of early imported seed mixtures, encroached and supplemented the bentgrass to make up a **Poa**-bentgrass fairway turf. Once **Poa annua** gained a hold it spread very quickly. The battle has raged ever since.

What are the Jekyll-Hyde characteristics that cause **Poa annua** to be denounced so vigorously by some and defended so strongly by others?

As Jekyll

1. It affords an excellent lie—**Poa annua** can be cut as closely as the terrain will permit; from 3/16's to 3/4's of an inch. No amount of argument can change the fact that this is what a fairway should be —closely cut for golf: as close as the specific grass being grown allows.
3. It forms a dense turf—**Poa annua** seeds heavily; seeds germinate in close proximity to one another and thrive well despite the high plant density per square inch. **Poa annua** seems to adjust to crowded conditions better than other turfgrasses.
3. It is relatively easy to grow at least six months of the year. **Poa annua** seeds profusely at any height of cut, and the seeds drop and remain viable apparently for several years. When conditions are right, the seeds can germinate within a few days. Disturb the soil in spring or fall and up pops **Poa!**
4. It has excellent color for most of the year. It becomes green earlier than bentgrass in spring, and stays green longer into the fall-winter season. Growing alongside each other bent color looks anemic compared with well-fertilized **Poa annua** during most of the spring and fall.
5. It comes disguised as a friend. It is a handsome appearing plant resembling a dwarf Merion bluegrass, and somehow things in perfect miniature always give a good psychological impression with people.

As Hyde

1. It is unpredictable in summer. During periods of high temperature and high humidity, **Poa annua** can disappear completely within a day. Once the plant goes,

it is dead and makes no recovery in summer. This opens the door to crabgrass, knotweed, spurge, plantain, dandelion and other weeds. **Poa** regrowth occurs from seed that is in the soil, but germination takes place during periods of cool nights, from late August on through the winter.

Odds that favor **Poa annua** at 6 to 1 are hard to pass up. It's human nature to gamble and many accept the challenge yearly. Also involved are the desires of the playing members; they clamor for extending the golfing season by starting earlier in spring and finishing later in winter.

They also are looking for turf of summer quality the year around. Forcing permanent grass only weakens it and encourages the **Poa annua** to take over. The present dilemma in many cases is an expression of the desires of the membership. Yet the danger lasts only through July and August. The injury is proportionate to the summer heat and humidity. Turf loss is not always severe.

Also, in the last few years headway has been made in techniques designed to keep **Poa annua** healthy in summer. It seems that experience tends to direct more and more programs toward attempts to keep the **Poa** alive. In effect, we are becoming a nation of **Poa** pamperers!

From the agronomic standpoint, **Poa annua** can never be considered a sound turfgrass as long as the possibility of complete summer failure exists. Either we must find a certain method of providing **Poa annua** with safe passage through July and August or we must breed a permanent cool-season grass that will grow 10 months of the year like **Poa annua** grows and looks in May. There is no question that the latter is the sound approach to better fairways on northern courses.

Out with Poa Annua

by SHERWOOD A. MOORE, Superintendent, Winged Foot Golf Club, Mamaroneck, N. Y.

Many times fairways are burned off thoroughly to rid them of **Poa annua,** aerated, seeded to bents and then in a few years, they're solid **Poa annua** again. Certainly this is discouraging, but perhaps it can be avoided through careful maintenance practices that follow the renovation.

Listed below are a few of the principal practices and what can be done to improve them:

Mowing

This is one of the most important operations and yet one of the most abused and neglected practices.

On watered bent fairways, cut often, cut close and change directions.

Move the tractor out of the same wheel marks by raising the outside mower or throwing it out of gear and allowing it to overlap in the rough; then occasionally mow a few feet inside the fairway edge, going out to fairway boundary on the next mowing.

Be careful in turning fairway units.

Pull tractors and gang mowers off approaches and bottleneck areas and mow instead with triplex mowers.

Fertilizing

Many problems are created unnecessarily and one of them is caused by poor fertilizing practices—mainly overfertilization.

During some of our real tough seasons, the low budget courses came through in better condition than some of our lush layouts. They could apply only a minimum of fertilizer and in many cases no water at all.

Think twice before applying large quantities of fertilizer, especially in a single application.

On a new golf course or new turf areas and on very sandy soils fertilizer might be used more liberally than on an old established course, or where the soil is a clay loam.

The practice at Winged Foot is to apply a maximum of two pounds of nitrogen per 1,000 square feet per season. In some seasons it has been even less. The course is fertilized often and lightly using four to five applications each season. A complete fertilizer, such as a 10-6-4, is applied in late May at the rate of half a pound of nitrogen per 1,000 square feet and during June, July and August three applications of sewerage sludge is applied totaling one pound of nitrogen per 1,000 square feet to be followed in the fall with another one half pound of nitrogen from a complete fertilizer.

Watering

Watering is a maintenance practice that is

mismanaged more than any other.

We water a lot more than necessary. The summer of 1965 proved this to those in Westchester County, New York, that when water is curtailed, turf still can survive—a lot better than we may think.

We try to water fairways thoroughly twice a week in dry periods, but when the temperature rises above 90 degrees we reduce the watering time, but include an extra watering in that week.

Automatic watering systems even require more of that "man" in management because it is so easy to push buttons.

Liming

Liming is one of the cheapest and most important of operations, yet it, too, is very much neglected.

It is an annual practice at Winged Foot to apply half a ton of lime per acre to fairways.

During a busy season or when the weather does not permit, an application can be missed with no worry and done the next year.

Lime moves slowly through the soil and it should be applied lightly and steadily, thus eliminating large applications which require a lot of material and time to apply, and which might also result in a layer on the soil.

Drainage

Drainage is a continuing program at Winged Foot. We have installed thousands of feet of tile—from 4-inch to 21-inch—throughout fairways and roughs.

Drainage is a long-range program. Along with drainage lines, apply gypsum as a soil conditioner in heavy, wet clay soils.

After renovation work at Winged Foot, gypsum was applied for two consecutive years at the rate of one ton per acre. We feel that we derived some benefits from it.

Fungicides and Insecticides

Spraying for disease and insect control is a necessity for watered bentgrass fairways. A fungicide (four-fifths of a quart of 10% phenyl mercuric acetate in 40 gallons of water per acre) is applied approximately six times during the season.

This is based on a curative program—not a preventative. Whenever we see the disease, we spray. A quarter ounce of iron per 1,000 square feet is generally added to the phenyl-mercury.

Approximately once a month an insecticide is added to the mixture for web and cut worm control. It is not an elaborate program, but it is designed to give the turf at least an optimum chance against the ravages of disease and insects. If chinch bugs or other insects become a serious threat, we do not hesitate to protect the turf against them.

Herbicides

No large-scale spraying of phenoxys has been done to the Winged Foot fairways since the renovation. Applications of 2,4-D and 2,4,5-T have been limited to spot spraying. We have sprayed isolated areas—beginnings and edges of fairways —with MCPP or Dicamba for knotweed or chickweed control.

Crabgrass has not been a serious weed and has required isolated post emergent spraying with disodium methyl arsonate (DSMA). We have also experimented with pre-emerge herbicides on a very small scale.

Crabgrass in rough areas has been sprayed using DSMA, 4 pounds of actual per acre plus a quarter pound of 2,4-D, with excellent results. This in turn has benefited the fairways by eliminating seeds.

Calcium arsenate gave drastic reduction in **Poa annua,** but these plots showed signs of stress during hot summer months. We have not applied it wholesale, but after the success reported by some others, these plots will be expanded considerably this summer.

Sodium arsenite at one pound per acre is used to a limited extent during the cool spring or summer months. It is a chemical that requires care, for its response depends on temperature and soil moisture, among many other factors.

Endothal is one chemical that has been used to great extent. Near the end of April we apply two applications of Endothal at the rate of one-half pound actual per treatment with 40 gallons of water per acre. These are applied a week to 10 days apart.

Endothal is another erratic chemical, depending on soil moisture and temperature. It retards and diminishes the seed formation of **Poa annua** and at the same time eliminates clover.

We are advocates of Endothal for I believe it has encouraged the bentgrass in our fairways.

Annual Fall Program

Aerify—once or twice over.

Aero-thatch poor or thin areas.

Seed: Seaside 25% and Colonial 75% mixture at the rate of 20 pounds per acre.

Fertilize as mentioned previously.

Mat and mow.

Scorched Earth at Knickerbocker

by RICHARD SILVAR, Superintendent, Knickerbocker Country Club, Tenafly, N. J.

In 1964 Knickerbocker Country Club decided to start a "scorched earth" program. It was not an easy decision to make because it involved a lot of work, expense and inconvenience for the membership.

The fairways were almost 100% annual bluegrass. Some years we were able to hold our own, and sometimes we didn't do so well. We tried just about everything. It was quite discouraging to work so hard, and spend so much money on something that might quit when the going got the toughest. It was hard to explain to the members that what looked good to them was something superintendents considered a weed. With the help of the USGA Green Section this job was made much easier.

Seven fairways were finished in the first year of the renovation, which was begun in September. In 1965 eleven fairways and all of the tees were scorched and reseeded. The recommendations of the USGA Green Section were followed, with a few modifications.

One week prior to the program, MCPP was applied at the highest recommended rate. This was done to remove clover. The sodium arsenite treatment was made in two applications one week apart. The first application was five gallons per acre. The second application was three gallons per acre. Water was applied every second day to germinate the weed seeds in between applications. After each sodium arsenite application we thatched and removed as much debris as possible. Two days after thatching for the second time, we fertilized with a 10-10-10 and were now ready for seeding.

The seed mixture was 70% astoria bent, 15% seaside bent, and 15% highland bent seeded at 100 pounds per acre.

The 1965 program was started in August. On the first day 11 fairways were scorched. Sections of the course were closed while work was in progress. Things went much easier and 14 days later all the work was finished and 11 fairways were seeded. Because of a shortage of water, work on the tees was delayed until Labor Day. The same rates and materials were used for the tees.

Our fairways are now mowed ½ inch during the spring and fall. During the summer months the mowers are raised to ⅝ inch. The low handicap player appreciates the low cut and the lie it affords. The higher handicap player complains that he can't use his No. 2 wood. However, they all enjoy the added roll. This is due to close clipping and the tremendous amount of thatch removed from these fairways. Thatch will take some time to build up again.

Tees are cut at ⅜ inch and are mowed with greens mowers. They receive the same care as a green, except for cutting. Tees are cut three to four times a week. They have held up well and show little wear if markers are moved daily. We also developed winter tees that are used when the grass becomes dormant. This will save on the maintenance of regular tees.

Any work on a golf course causes inconvenience to the members and results in criticism. Members of the Board of Directors at Knickerbocker knew the kind of golf course they wanted and gave this program their complete support. This program involves a lot of work, but the results have been gratifying.

Seed and Seeding

by ALBERT NEUBERGER, Agronomist, USGA Green Section

In any renovation or rebuilding program, the seeding process is extremely important and should always be given careful consideration. What kind of seed or seed mixture should be used, at what rate it should be sown, and when it should be sown are the three basic questions. There are many others.

Seed and Seed Mixtures

Bluegrass-fescue:

Merion and Common—35-40% usually equal amounts of each.

Illahee, Chewings or Pennlawn red fescue—55-65%.

Bentgrass (Colonial)—no more than 5%.

Bentgrass:

Astoria and/or Highland—60-70%.

Seaside—10-25%.

Penncross—10-25%.

Bentgrass used in seedings with bluegrass and fescue should be sown separately because it is so much smaller and lighter than the other two. Size and weight definitely affect distribution. Ryegrass may be used in mixtures up to 40 percent, but it has been shown that large quantities of ryegrass in mixtures inhibit establishment of the permanent grasses.

Seeding Rates

New seeding:

Bentgrass or bentgrass mixtures—70-80 pounds per acre.

Bluegrass-fescue mixtures—100-150 pounds per acre.

Ryegrass—50-100 pounds per acre.

Overseeding:

Bentgrass—15-50 pounds per acre.

Bluegrass-fescue—75-100 pounds per acre.

Time of Seeding

Our thoughts have tended toward earlier seeding, especially where **Poa annua** is a problem. In the Northeast, bentgrass seeding should be completed by mid or late August. For bluegrass and fescue, seeding should be completed by mid-September.

Mulches

For problem areas such as slopes or gravelly areas, mulches may be used to some advantage. Although mulches definitely are helpful, cost usually prohibits large scale use. For smaller areas, 6 mil clean polyethylene sheets have been used with quite consistent success. The covers are especially useful where lack of water is a problem.

The importance of using quality seed cannot be emphasized too much. Certified or "blue tag" seed is recommended strongly for all permanent seeding. Certification programs have greatly reduced trash seed. By purchasing from reputable seed dealers, chances of obtaining poor seed are once again reduced. Use good seed!

The Case for Forward Tees

by MISS CAROL McCUE, Executive Secretary, Chicago District Golf Association

In any program of renovation, serious consideration should be given to the forward tees. They're usually referred to as "ladies tees," but a great many men, too, would like to hit from a forward tee.

About half the golfers have handicaps of over 18 and most of those players would like to have a shorter, but an interesting course, with a course rating for both men and women from a forward tee. Call it whatever you choose—red, blue, any term, but rate the course so that women can play a little longer course if they would like, and so that men can play a shorter course. Many senior players or men with their wives would all like a little more interesting course to play.

When we do have a shorter tee, place it in a position so that the character of the hole isn't destroyed. On too many holes, particularly par 4's, the tee is merely moved forward 20 or 30 yards and with this all the character and interest is lost. Players who don't hit the ball quite as far are entitled to the same challenge of hitting an exciting shot, playing for a birdie, or hitting a more conservative shot, playing for a bogey or par. But, too often a hole that might be a dog-leg at 360 to 380 yards is cut down to 340 for the women. Then the hazards are no longer important.

Particularly on the older courses being renovated now, give the short hitters as interesting a game as you give to the longer hitters.

Sand vs. Grass

by LEE RECORD, Agronomist, USGA Green Section

Increased play and rising labor costs have led to havoc on many courses. The omission of cultural and daily maintenance is a serious problem. One of the most serious problems facing the golf course superintendent is the maintenance of his sand bunkers. There is no doubt that they are costly to maintain. One golf course in the Midwest spends over $5,000 each year to maintain about 80 sand bunkers, a cost that will undoubtedly continue to rise.

Many club officials and course superintendents will be faced with the choice of either continuing to meet the high cost of daily sand bunker maintenance, or gradually establishing grass hollows in their place.

Selecting the sand which is to be used in the bunker is of utmost importance. Uniform systems of classification can be used as a guide for sand selection; the National Bureau of Standards (U.S. No.) and American Standard for Testing Materials (Tyler Scale) are two systems of classification based on particle size.

The best particle size for sand traps is a very coarse sand, (1 mm. in size). From an economic standpoint it may be quite costly to obtain sand of this uniform size because of the special screening that would be required. Sand of any particle size may easily be obtained in some localities. However, individual grains should be examined. Rounded grains will leave the sand too loose and golf balls will be buried too deeply. Angular grains rather than rounded ones are preferred.

Particle size, too, affects the speed of play. Any sand over 1 mm. in size can cause damage to mowing equipment if it is left on the green after the golfer plays an explosion shot.

Sand in bunkers cannot be packed hard. Normally, a golfer should have the option of either picking the ball clean or playing an explosion shot.

Sand that is packed hard prevents the explosion, the shot most often used. A normal sand wedge has a flange at its base; this flange is thick and it must have soft sand to execute the explosion shot. A wedge used on hard sand will bounce off the sand and all ball control will be lost.

The condition of bunkers around greens should contain soft, coarse, uniformly-raked sand. The depth of sand should be between four and six inches. A uniform, coarse sand of the 1 mm. particle size will take several months to settle properly while silica sand, a by-product of the glass industry, will take a year or more.

Sand should offer a hazard. The ball should bury up to about one-half its depth, but it should not sit up on top and provide a clean shot. The sand bunker should be a fair hazard, and sand should add to, not minimize the hazard.

Should a club convert to grass hollows? Grass would require less maintenance time than sand. It might also speed play because footprints or steps would not have to be raked. Paths would not necessarily be worn around greens as they are now.

Grass hollows, however, are not as attractive as sand bunkers. Sand acts as a visual aid for the golfer and outlines the target area. Grass would be more difficult to play from if it were cut between two and four inches.

A panel of golf course architects, superintendents, golf professionals, amateurs, and Green Section agronomists participated in a symposium conducted for the "USGA Golf Journal" in 1964. Quotations from this article, "The Case of Sand vs. Grass," are listed below:

"I think a reasonable combination of both sand and grass traps is the best arrangement for any golf course, both for beauty and playability."

"Unless a sand bunker is maintained to perfection, it becomes an irritation to all golfers and is a most unfair hazard."

"It is our feeling that grass hollows should be used more, especially in areas below the natural level or grade of the surrounding terrain. Sand should not be used in such a location; it catches run-off water and soil and is very difficult to maintain."

"Most courses have the majority of their traps misplaced and the wrong kind of sand is used."

"Grass hollows will not erode due to wind or water; sand of course will. Rough grass will be 'playable' sooner after irrigation than will sand areas. Wet sand causes miserable golfing con-

ditions. However, sand bunkers do highlight a green by the color contrast provided."

"The tendency in our area is to remove sand traps from the fairways, but to keep them around the greens and perhaps add more."

"Rough grass will take the place of the sand bunker only in the case of economic necessity."

The rough hollow will undoubtedly come into increased use.

Bunker Renovation

by EDWARD J. CASEY, Superintendent, Baltusrol Golf Club, Springfield, N. J.

Renovation of bunkers is a recurring item in maintenance operations. The turfgrasses deteriorate and the sand becomes old and dirty; we accept this as normal. Beyond that are three factors which strongly influence overall deterioration of bunkers:

1. Location and design: These are controlled by the requirements of the game. The more difficult the location, the more critical the design.
2. The isolation of bunkers relative to maintenance: Bunkers are individual and isolated maintenance problems. They cannot be quickly and efficiently mowed by gang units.
3. The isolation of bunkers with regard to irrigation: They cannot be efficiently irrigated individually with the present systems which water everything in the general green area. Presently the putting green, apron, traps, bunkers, and rough adjacent to green are all watered when sprinklers are turned on.

Experience taught that irrigation in and around bunkers was necessary if the job was to last. Therefore, pop-up sprinkler heads delivering 1½ gallons per minute were installed 12 to 14 feet apart throughout the bunker, conforming with design. **We now know that this system irrigates without wetting the sand.** Baltusrol's lower course has 126 bunkers. Of these, 100 were irrigated by an average of 10 heads per bunker. The largest required 82 heads.

In preparing the bunkers for improvement, the old sod was stripped off and the area was cultivated with grub hoes, thereby removing a thick rootbound layer. Topsoil was added and then limed, fertilized, and sodded. Two bunkers were redesigned, one of them a monstrous bunker which crosses No. 17 fairway. Of the 126 bunkers on the lower course, the site of the 1967 United States Open Championship, 105 were renovated.

Improving the bunkers further, 700 to 800 tons of sand was removed and replaced with 1,500 tons of new sand. This is a lot of material to handle!

Small sprinklers around the edge of bunkers keep turf healthy without wetting sand.

BEFORE—Difficult to maintain bunker complex across the 17th fairway at the Baltusrol Golf Club Lower Course, where the 1967 United States Open Championship will be played.

AFTER—With a new arrangement, all turf areas are easily accessible to mowers. It's prettier, too.

The Finishing Touch

by DENNIS SNYDER, Superintendent, Scioto Country Club, Columbus, Ohio*

Like many of the fine clubs built during the early 1920's, Scioto has had its highs and lows in condition and activity. During the late 1950's and early 60's, however, the membership began to realize that Scioto was no longer the golf course it had been. They reached the conclusion that a 40-year period had taken its toll. During the next seven years, a gigantic overhaul was planned and implemented. This was the program:

1. 1959: Fairways were sterilized and seeded to bentgrass.

2. 1962 to 1964: The entire 18 holes were redesigned and rebuilt by a leading architect.

3. Four new tenico tennis courts were built in the Spring of 1965.

4. 1966: Construction was to include two additional swimming pools, a new golf cart storage building for 36 carts, new golf course maintenance facilities, new half-way house restaurant on the golf course as well as a complete overhaul of the main clubhouse, which includes additions to the golf shop and kitchen.

5. Last fall Scioto began to relevel and rebuild all of the tees which settled badly during reconstruction. This will be completed later this year.

This about covers the major changes at Scioto during recent years, but some additional touches were added, which helped give the members a feeling of pride and pleasure to be a Scioto member.

After the major problem of establishing excellent turf on all greens, tees, fairways and rough is accomplished, the housekeeping and decor of the golf course and grounds should be examined.

Three sets of flags add color and interest; regular flags are gold and black for the front nine, and white and black for the back nine. These two color combinations are attached to white and black flag poles. The insides of cups are also a high gloss white like we see on television. On Tuesday and Thursday ladies' days, as well as for women's tournaments, Scioto uses the standard pink flag with black lace and numerals. These are attached to pink and white striped poles and have been praised by Scioto ladies.

Four sets of tee markers are used in order to allow all golfers to play the length of course best suited to their game as well as to spread out daily wear of the tee surface. These are red for ladies, white for seniors and juniors, gold for the regular course and blue for the championship course.

All tee accessories, such as benches, ball washers and waste cans, are painted in a natural color theme of evergreen on metal, and redwood on wooden surfaces. All drinking fountains are made of teakwood, with copper and stainless steel fittings.

Tanbark is used as a border for all ball washers, fountains and heavy wear areas near tees and greens. Tanbark is also used on about half of the cart roads near greens; it is much more natural looking than asphalt.

Redwood signs at each tee have been designed to give exact information as well as decor for each hole. The information includes hole number, par and yardage, and a cut-to-scale aerial diagram of the hole, complete with all bunkers and hazards in color. The name of each hole is also routed into the wood above each diagram.

Landscaping of the golf course and grounds has been a major off-season project at Scioto. This included the removal of all dead trees and all tree stumps, pruning of all existing trees and shrubs, planting hundreds of new deciduous and evergreen trees and shrubs. It has also involved plantings of thousands of annuals in the numerous flower beds through the Clubhouse grounds.

Approximately 2,000 to 3,000 lineal feet of natural limestone rock walls are now being installed on either side of the streams and lakes throughout the course. This is accomplished during winter months for beautification as well as erosion control.

In addition to the stone walls, dams have been built to serve as breakwaters every 30 to 50 lineal yards and to add to the beauty of our stream and two lakes. These dams and waterfalls seem to be the only ones in existence in the area and have been the point of much comment from members and guests of Scioto.

*This paper was prepared for presentation at the Green Section Conference, but Mr. Snyder was unable to attend. He sent this text to the Editor of the Green Section Record.

Financing the Renovation

by HARRY C. ECKHOFF, Executive Director, National Golf Foundation

Increased costs of construction and the rather severe shortage of mortgage money have slowed golf course development in recent months.

New golf course openings were down 10.6 per cent in 1966. New construction at the moment is down 14 per cent from a year ago. This might be caused by the tight money situation. However, additions to existing courses were up 14 per cent; and 37 per cent of the current construction pertains to additions, indicating that financing is somewhat easier to obtain for established golf courses.

A recent survey by the National Golf Foundation shows that 54 per cent of the courses that responded plan to make golf course improvements in 1967; 40 per cent will expand parking facilities; 34 per cent plan to procure powered golf cars; 24 per cent will improve dining facilities and 23 per cent plan to modernize pro shop facilities.

The survey reveals that 40 per cent will finance their ventures from profits, 26 per cent will increase dues and green fees, 18 per cent hope to secure bank loans and 12 per cent plan to increase existing mortgages. Methods of financing depend on the type of golf courses involved. The avenues of financing vary among the nonprofit member-owned clubs, a privately-owned facility, or a municipal operation.

There are several Federal financing programs available. The Farmers Home Administration of the Department of Agriculture during 1966 made 95 loans totalling $13,311,070 to nonprofit associations for the construction of recreation facilities—all 95 included golf courses. Loans of this type are available only to nonprofit associations serving rural areas or towns of not more than 5,500 population. The maximum term is 40 years and the interest rate is usually 5 per cent. The maximum loan is $4 million.

During the past three years the Farmers Home Administration has made 211 loans totalling $27,979,410 for recreation projects that included golf courses. The loans averaged $132,600 and ranged from $8,200 to $820,000. Some of these were for expansion and renovation programs.

Operators of privately-owned, profit-motive golf courses planning renovation programs may wish to explore the possibility of a Small Business Administration loan. The maximum loan made by this agency is $350,000 and is usually repayable in monthly installments over a 10-year period bearing interest at 5½ to 6 per cent. The SBA prefers that local financial institutions participate in loans whenever possible. It will make direct loans when financing is not available locally on reasonable terms. The SBA maintains 59 regional offices.

Probably the best loan source for private member-owned country clubs is a local bank. Clubs with realistic membership fees and dues structures find it possible to receive renovation loans. Existing successful facilities planning renovation programs have a much greater chance of securing a local bank loan than a new operation.

Municipal golf projects have many possible ways of financing new construction or renovation programs. Most existing municipal golf courses have been financed through general obligation bonds, or by general budget allocations. General obligation bonds are based on the municipality's credit and taxing power and issues must be approved by voters.

In recent years some cities and counties have financed many municipal golf courses by issuing revenue bonds which are payable from the net income of the golf course. Since revenue bonds are usually unsecured by collateral other than the golf course itself, they normally carry a higher rate of interest than general obligation bonds. Revenue bond issues, depending upon state statute, may require approval by public referendum.

Cities, counties and states seeking to acquire open space for golf courses and other recreational use may contact the Department of Housing and Urban Development, Washington, D.C., for a loan or outright benefit grant. This agency has made over 570 grants totalling $72,000,000 to help communities protect their open spaces for use as parks, recreation, conservation, scenic and historic purposes. The usual policy is to grant matching funds for approved projects. Some states have similar programs in operation.

Two recent government publications of the Bureau of Outdoor Recreation, Department of Interior, Washington, D.C., may help planning groups. They are:

1. Federal Assistance in Outdoor Recreation which lists all the Federal programs of assistance to outdoor recreation. Such assistance involves credit, cost sharing, technical aid, educational services and research. The pamphlet costs 35 cents.

2. A Directory of Private Organizations Providing Assistance In Outdoor Recreation, available for 30 cents, lists organizations that have assistance programs in various outdoor recreation fields.

Adequate financing is of utmost importance. If sufficient financing is not available to complete your job according to accepted standards is might be better to cancel it.

USGA GREEN SECTION RECORD
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TURF TWISTERS

CARTS ON FROZEN TURF

Question: Will you please be good enough to inform me if, in your opinion, frost or frozen ground can injure a course in any way if a cart is used during the frozen period only? (N.Y.)

Answer: 1. The cart will not injure the soil structure in any way when the ground is frozen so it is safe to use it at this time. It is only when the ground thaws that soil compaction results.

2. When the soil is frozen, the grass is also frozen, and using a cart at this time does injure the grasses. What happens is that frozen blades are cracked and damaged—the cells rupture, and injured blades are most susceptible to diseases of winter and spring. The injured permanent (bent) grasses then are subtly replaced by **Poa annua,** and this grass spells trouble in July and August.

In summary, the trained eye can discern the changeover. The average member can't. To the average member, **Poa annua** looks as good as bentgrass—sometimes better!

INSECTS, ANTI-FREEZE

Question: Last week, I came across this piece in our local paper. "Some insects, like chinch bugs, produce an anti-freeze chemical that keeps their insides from turning into ice in winter. Others freeze without injury, and await the spring thaw." I was wondering if this statement was accurate and, if so, about the mechanics of such a phenomenon? (N.J.)

Answer: In answer to your question about an anti-freeze chemical produced by chinch bugs to prevent freezing, this phenomenon undoubtedly concerns glycogen (glycol), a carbohydrate related to starch and found in insects and warm-blooded animals.

Many, if not all insect species (including chinch bugs) do have the built-in ability to survive very low (minus O-degrees centigrade) winter temperatures without apparent deleterious effects. Obviously, glycogen plays a major part in survival.

It would also appear that the water within the insect's body cells moves out of the cells into the inter-cellular areas where freezing will do no harm. If this translocation of moisture did not occur, the accumulation of water crystals inside of the cells would rupture their pervious walls.

PENNCROSS ON FAIRWAYS

Question: I have heard some discussion on the use of Penncross bentgrass alone or in a seed mixture for use as fairway turf. What are your thoughts on this? (Conn.)

Answer: At the present time we know of only one Pennsylvania club which has predominantly Penncross fairways and results have been good. Just as on greens, Penncross on fairways would require an intensive maintenance program but limited evidence seems to indicate that Penncross may be used more in the future.