

Source and Cure of Course Drainage Problems

By **KENNETH WELTON**

Indiana State Soil Conservationist

At Midwest Regional Turf Conference

FOR MANY YEARS I was intimately concerned with golf course drainage both as a golf course builder and as a technician of the USGA Green Section. I have had little to do with golf course problems during the past 11 years but have maintained contact with the utilization and control of water, including drainage, in my work with the USDA Soil Conservation Service.

I have investigated the recent developments in golf course drainage and the present thinking of those engaged in fine turf maintenance. I was impressed with the fact that the same questions concerning moisture supply and drainage in putting greens are being raised today as were 10 years ago and that there appears to be an absence of any new data bearing on this subject. This situation while indicating the need for further investigation in this field also gives me more assurance in discussing it.

It would seem that a review of some of the accepted data on drainage, a little theorizing on what we are after, and what use we can make of the facts at hand may be helpful to some and will at least stimulate constructive thinking. My remarks will mostly concern putting greens. Drainage problems on other parts of the golf course are present but are less specialized.

Water and Air Balance

We should bear in mind that we must maintain a correct balance in the soil between water and air for plant growth. Plants need water which they get through their roots; they also need oxygen at their roots or they will die. The optimum condition is where the soil particles are surrounded by a thick layer of water with air filling the voids between the moisture-coated particles. Therefore our first requirement is to build a soil sufficiently porous to allow water to infiltrate the soil and at the same time to allow the surplus water to drain away quickly either naturally or by artificial aids.

If we do not have sufficient drainage, natural or artificial, we are faced with several results all of which will be disastrous under various conditions.

If puddles remain on the surface of the greens after a heavy rain the greens cannot be played. If the soil remains saturated with water during cold weather

the soil will heave, breaking many of the fine roots and as a result the sod will dry and kill at the next warm dry spell. This killing on greens should be differentiated from killing resulting from disease. If the soil remains too moist near the surface during hot weather the humidity created at the surface provides an optimum condition for fungus and other turf diseases. In any event under poor drainage the turf soon becomes weakened by lack of oxygen and certain plant nutrients which depend upon the presence of sufficient oxygen at the roots for their availability.

Possibly just as important, is the effect of the trampling by players and others on saturated soil. First the depressions left by heelmarks make the putting surface uneven and secondly the desirable soil structure, or loose arrangement of soil particles that leaves voids between the particles for moisture and air, is destroyed. Trampling a plastic soil, one with sufficient clay or silt in it to make it act like putty when wet, will compress it to a point where it is dense and compact and contains little pore space. Puddled or compacted soil will not support plant growth under extreme putting green conditions and will dry almost as hard as a pavement. Then the players will yell because they cannot hold a ball on the green.

Movement of Moisture in Soil

Before exploring for the answer to the problems created by these factors we should all have a clearer understanding of the movement of moisture in the soil. If you will examine the accompanying sketch you will see a cross section of soil which is typical of most putting greens. In other words you see the prepared top soil area underlaid with a compact soil, which is usually clay or silt that was used as fill in building up the green. The two types of water we are concerned with are illustrated. The dark areas that fill the voids between the particles are free or gravitational water. It will drain away by gravity if the subsoil is sufficiently porous or if there is tiling. But as it drains away it will suck air into the voids or pore spaces between the soil particles and will also leave each soil particle coated with a layer of water. This water is held to the particles by surface tension and is called capillary moisture.

Everyone knows the action of free or

gravitational water; the only impediment to it running from the soil by gravity is the interference of the soil particles. So if we have a porous subsoil or tile openings gravity will force it through these and away from the top soil. But fewer are aware of the action and value of capillary moisture. First we should realize that generally speaking it is the only type of moisture that plants use. It clings to each soil particle against the pull of gravity after the free water drains away and is unaffected by drainage up to this point. As the surface soil dries, however, it will be affected by the water table or level of free water in the soil which in turn is affected by drainage. This angle will be discussed later.

As the plants draw upon the capillary water coating the soil particles and as evaporation takes place from the surface, the layers of capillary water become thinner at the point where the water is being drawn from. But nature always seeks an equilibrium, so as the layers of capillary water become thin and the soil becomes drier at one point the capillary water moves from moist areas where the capillary layers are thick to drier areas until the layers are of equal thickness.

Four Factors in Drainage

From the above it would seem that we

are concerned with several important factors.

1. Surface drainage.
2. Good porous soil structure.
3. Non plastic surface soil.
4. Adequate sub-surface drainage.

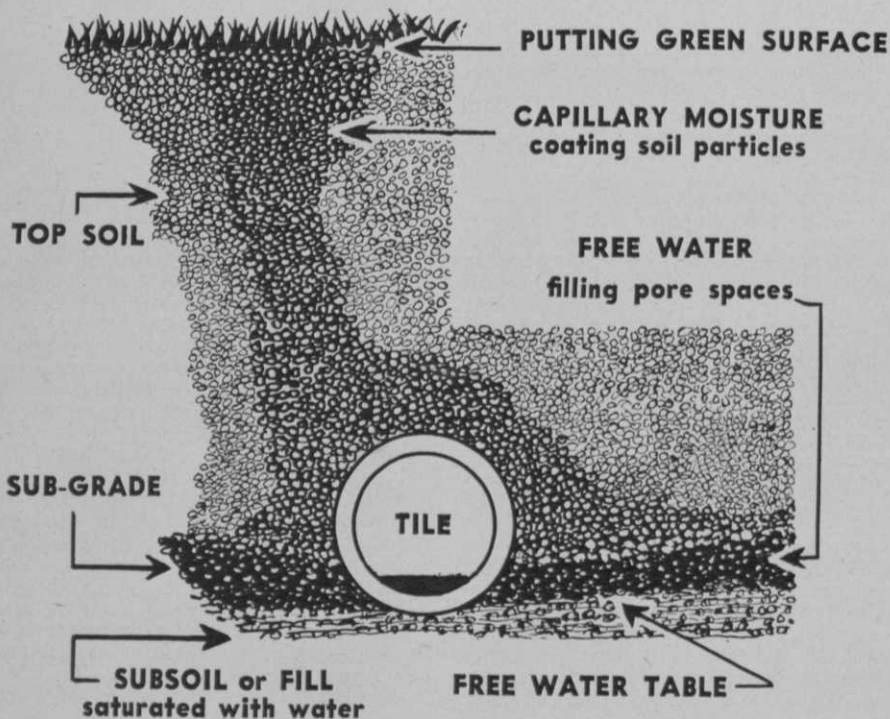
Surface drainage may be readily cared for by the shaping of the surface of the green. Most golf course architects feel that a 3% slope is the maximum grade that should be allowed on the main putting area, although more grade may be allowed around the edges or even through the green when changing from one putting level to another. With these possibilities there is plenty of latitude for adequate surface drainage. It is better not to drain all the water onto the approach of the green to avoid over-wet conditions on this important area. Greens can usually be graded so that some of the surface water can be drained to one or both sides.

Obtaining good soil structure is a more difficult task. It is not enough to find a good brown or black topsoil which seems to be open and porous under natural conditions. When some naturally porous soils are used on a putting green, they may soon lose their porosity and become compact and hard through frequent tramping when wet.

(Continued on Page 70)

CROSS-SECTION OF PUTTING GREEN

Illustrative only—not drawn to scale



Army Wives Get Basic Training in Golf

By DAVID D. MARSH

COL. "SPARKY" BAIRD, manager of the beautiful Fort Leavenworth (Ks.) Officer's club starts the golf season by offering wives of personnel attached to the Fort a series of golf lessons. The short course of instructions—which is gratis by the way—is given to groups of around 50 students. The students are nearly 100% beginners.

As a preliminary to the short course, Col. Baird devoted an evening to a showing of moving pictures featuring the nationally known stars. This served as an appetizer and gave the students a good mental picture to carry with them to their first lesson. It also put them in a golfing frame of mind.

The course itself is divided into 3 parts; the grip and stance; taking the club back; the swing and follow through. The chief principle stressed in the first part is that the grip is never changed from the start of the swing to the finish.

One of Col. Baird's theories—and one which varies somewhat from many teachers—is that the ball should be fitted or adjusted to the player, not the player to the ball. That is the student stands in what is for her a comfortable position, then the ball is placed in position to be hit.

Developing aptitude for the golf swing through exercises is another Baird idea which has shown good results. After taking a comfortable stance, the class is di-

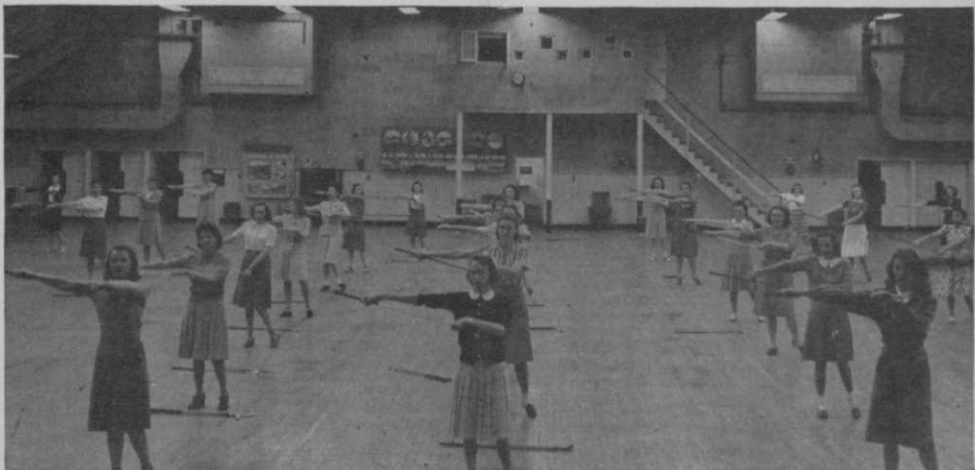
rected in an exercise designed to teach body *turn* (not swaying) and to introduce dormant golfing muscles to activity. In addition to this turning exercise the Colonel also has the students hold a club horizontally in front, then raise the club to a perpendicular position using the hands only. This movement exercises the lethargic muscles of the forearm and gives the hands more hitting power.

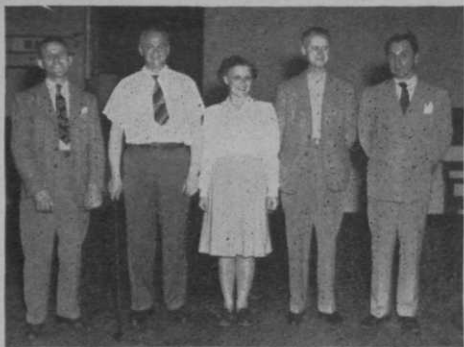
A pleasing innovation is the music which accompanies the exercises and does much to smooth the jerky movements of the novices. A victrola and electronic loud speaker arrangement carry the notes of the rhythmic Missouri Waltz to all corners of the large class room (a room not long since devoted to the grim business of war). The rhythm of the golf swing is readily adapted to the Missouri Waltz and quickly the entire class is swinging in unison—and with a real golf swing.

The popular Colonel originated his teaching method some 16 years ago while stationed in Virginia. He carried it out farther and in elaboration in Honolulu. Here the large classes of 200 or more were conducted out of doors at night. The unusual sight soon became a focal point of interest for sightseers as well as golfers.

Col. Baird is fortunate in having a large gymnasium size classroom, excellent lighting, plus the alert assistance of a number of WACs and other army personnel. A microphone attached to his shirt

Golf swing exercises are given the "slimming" and physical grace features so popular with women, in class lessons for Army wives at Ft. Leavenworth, Kansas.





Reading from left to right—Vic Szygiel, assistant pro, Colonel "Sparky" Baird, Mrs. Margaret Spears, and Gene Holmberg and Dave Marsh of Wilson Sporting Goods Company.

front leaves his arms free to demonstrate the correct swing—which he makes left handed in order not to confuse the students, who are facing him.

Mrs. Margaret Spear, an advanced student, assists Col. Baird on the stage and proves to the students that the Baird system works. Mrs. Spear has finished well up in several major women's tournaments.

The Colonel likes to have his pupils develop a picture finish. But he insists that it must be a natural finish or follow through. He impresses that the "picture finish" is a *result*, not a *cause* as so many beginners think. If the club is properly

swung, the follow through or "picture finish" will come without being forced.

After the swinging exercises are completed, a question and answer period is held. Uncertain points about grip, stance, and swing are cleared up.

By the end of the series of 3 lessons the students are well drilled in the fundamentals of the golf swing and are ready for individual lessons.

At the end of the final lesson each student is given a rule book and a small booklet listing the local rules and explaining the etiquette of golf.

The unselfish idea behind Col. Baird's program is simply this; to acquaint each student with the fundamentals of the golf stroke and to provide her a sound basis for further instruction at the hands of a pro. This idea is particularly valuable to Army wives since they move about frequently and a prolonged course of instructions might be interrupted before its completion.

Darrell Wilson, out of army, selected as pro at Springfield, Mo., new many course . . . Viscountess Astor new pres., English Women's Golfing Union . . . Jack Geals is new pro at Ticonderoga (N.Y.) CC . . . Jimmy Dolan, Hillcrest CC, Worcester, Mass., is coaching local high school golf team . . . Detroit, Mich., pros are demonstrating at each other's clubs in "Meet Your Pro" sessions.

PHILADELPHIA PROS IN TEACHING CLINIC

Philadelphia district PGA members gather at Llanerch CC for third in their series of instruction discussions that are tied in with their newspaper advertising campaign. Demonstrating is Walter Brickley, and Ted Bickle is pointing. Front Row, Kneeling:—L to R—George Sayers, Joe Chuck, Clarence Ehresman, Len Sheppard, Marty Lyons, Cas Banas, Jimmy Dangelo, Pete Henry, Willie Palumbo, Charlie Schneider, Ted Bickle. Standing, L to R—Geo. Sayers, Jr., Joe Zarhardt, Matt Kowal, Bob Aitken, Bill Boyle, Floyd March, Harry Markle, Henry Williams, Jr., Henry Williams, Sr., Elwood Poore, Ed Ginther, Wally Paul.



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U. S. Clubhouses Fail to Achieve Distinction

By **STANLEY ANDERSON**

Columnist, *Golf Monthly*, Edinburgh

WHILE IN the U. S. I have been asked many times by members of golf clubs whether, in my opinion, we run our golf clubs in Britain more attractively than you do in America. That is not an easy question to answer; conditions and requirements vary so much.

In Britain we do not have golf clubs that are miniature hotels which rather frequently is the case at larger clubs here. No one except the staff sleeps on the premises at our clubs. But all our first class courses have what is known as a "Dormy House." These houses are where a guest of the club or members may sleep. But except so far as the balance sheet is concerned, they have nothing whatsoever to do with the golf club.

Our golf clubs are much more intimate than yours. We have libraries filled with books and pictures of historic events that have taken place there, museums in which you can find famous golf sticks, famous golf balls and antiques of value to the game of golf.

We have billiard rooms and odd as it may sound, silence rooms. These are not used chiefly (as you may imagine) by grumpy old men who may wish to be alone, but for the convenience and relaxation of competitors. Nothing is more annoying or disturbing than to be surrounded by acquaintances or strangers just before competing in a big match. These rooms serve a very useful purpose and American clubs could take a leaf out of our book and institute quiet rooms in their own clubhouses.

Whether you think the idea of libraries, museum and billiard rooms are an asset to a club or not, I would not know, but I am certain that a silence room is a first class idea.

Women Are Out-of-Bounds

Then again we have rooms for bridge such as you do and we have rooms for men only. Women are only permitted in English golf clubs in one room and that is a room which is placed at the disposal of both sexes. I shall never forget the commotion which Walter Hagen and Denny Shute caused when they brought their respective wives into the great room at St. Andrews. This club, as you know, has stood for many years and they were the first women ever to have entered it. As it was the final of the championship and Shute was the winner, they were forgiven.

But the diehards at St. Andrews turned their heads away in consternation.

Women in this country hold a very different position to women in any other part of the world. In Britain and Europe they are rather grudgingly given an equality. But here in the U. S. A. they are put on pedestals and the men do as they are told. No European would stand for that, I am not going to be so stupid as to give my personal opinion on this matter except to say that there should be rooms in golf clubs outside the locker room which are for men only. Doubtless the women too would appreciate a room for themselves as well.

Food Specialties Featured

Though the food in American golf clubs is excellent, it has not the uniqueness of the specialties of some of the English clubs. It is said that Hagen once went all the way to Formby from Glen Eagles not to play golf but to eat the famous Formby shrimps, which are a specialty of the equally famous Formby GC. Every well known club in Britain has a particular dish of its own. I have not found that in America. Your food is very excellent and ample but, with all politeness, dull.

So far my readers will think perhaps that I am prejudiced in my own country's favor. That is not so. If I were asked bluntly the question I would say that the American clubs are more attractive. And yet there are certain obvious things you can learn and take advantage of from our rather ancient institutions. A few of them I have stated here.

Where U. S. Clubs Excel

Now by way of comparison let us look at the matter from your point of view. Ours are a disgrace. There are no show-ers to the best of my knowledge in any of our clubhouses. There is always a bath but the chance of getting it is remote.

Architecturally your buildings are much finer, though I must confess that I think that your architects sometimes miss the point. The idea, at least I think so, of a golf club is that it should be a friendly looking place and not as some of your architects seem to think, a terrifying building representing a monastery. I believe they really do frighten some people away.

Bellair, in Beverly Hills, Calif., has very nearly struck the right atmosphere.

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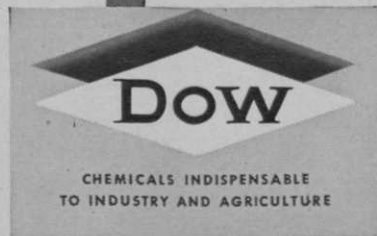
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They have every modern convenience such as bridges and lifts to save the players unnecessary steep hills, and yet with all their modernness they have obtained a certain remoteness and atmosphere of calm. This I find singularly lacking at most of the golf clubs in America. It is that, chiefly, I miss.

Americans are known to be the most hospitable people in the world. As I have travelled nearly all over it, I can second that statement with real facts and pleasure, and next on the list as a matter of interest, I would place the pre-war Polish nation. They were almost incredibly hospitable people.

In your golf clubs you have dances; most of the Scottish golf clubs would go up in smoke if such a thing took place. Golf clubs in Britain are golf clubs only and here they are country clubs. It is all a question of which you like best and what can be afforded.

Another interesting point is the status of the secretary of the club. In my country, with one exception, the secretary of a golf club of any note is a retired army man. But over here you do not seem to have secretaries in the same sense of the word as we do. The professional or manager is the boss. What he says usually goes. In England the secretary, even if he be a retired general with five stars, does as he is told.

I would put in all British golf clubs the modern conveniences that you have and I would try and place in yours an atmosphere, not more friendly, but one that allows each club to have its own personality. At the present moment as I see it, the golf clubs of America are mass produced and therefore lack just that distinctive something which would make them all the more enjoyable.

Women's Nat. Collegiate Tourney Is Resumed

★ After a wartime lapse the national collegiate golf tournament for women will be resumed at Ohio State University course, Columbus, O., July 8-13. The first of these events was a success with promise that it would become a major annual event for young women. Team and individual events are scheduled for the second annual affair. Competition will be in several flights in order to attract a large field of undergraduate girls from colleges throughout the country. Accommodations for contestants have been arranged in Neil dormitory at the university. Entrance fee is \$5.

Jersey's Suburban GC Has Golden Anniversary

★ Suburban GC, Union, N. J. is celebrating its 50th year in flourishing condition. The club is filled up with 235 members. Its assets are in excess of \$300,000. The clubhouse was redecorated prior to the opening of this season and 4 additional rooms and another bath were added to the employees' quarters.

During Suburban's life it has had only 3 pros; Bill Gourlay, Jim Dante and Marty Wallack who is on the job now. Frank Svehla is gkpr., and R. J. Miller, mgr.

Present officials have been in office for 10 years. B. T. Smith is pres.; W. F. Hopping, vp; C. S. Stallard, sec.; M. M. Bamberger, tres.; and E. W. Newcomb, asst. treas.

The club operates all year around. Last winter 81 members were Snow Bird players. The club is owned entirely by its members. It is managed by a board consisting of 18 members. The club never has had a reorganization or assessment.

Details of the early history of Suburban GC disclose that its first annual meeting was held at Elizabeth, N. J., March 2, 1896. Dr. Aliv R. Eaton was pres.; James S. Harris vp.; James W. Hall, Jr., sec.; and R. G. Sanford, tres.

The Park Villa and 16 acres of land were leased for \$400 a year and the house committee authorized to engage a steward and other help at a total cost not to exceed \$100 a month.

The initiation fee was set at \$10 and yearly dues at \$10.

The clubhouse was formally opened April 18, 1896 and on April 21st, a committee was appointed to lay out the golf course which was formally opened July 11th, 1896. The first course cost \$512.

A special Stage left the C. R. R. station at 2 and 2:45 P. M. to take them to the club at a cost of 25c per round trip.

Oct. 1st, 1896 it was reported that the club owned 7 sets of golf clubs and had received \$69.85 for use of the course and rental of the clubs.

Charges for golf were 10c per round and caddie fees were 5c per round.

A steward was engaged for \$60 a month from May to Oct. and \$40 a month from Nov. 1st to April 30th. He was required to feed all other help at his own expense. A waiter was engaged for \$20 a month.

April 10th, 1900 the Love Farm was leased at a rental of \$500.00 per year. This property consisting of 64 acres was purchased in 1912.

The club joined the N. J. GA in 1907; the Metropolitan and U. S. Golf Assns. in 1911.

The balance of the present property was purchased in 1919 and the present clubhouse was erected in 1922.



SCENE OF THE 46TH OPEN
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Beautiful Canterbury Golf Club, situated in the rolling hill country of the Shaker Heights section of Cleveland, celebrates its silver anniversary by acting as host to the 46th Open Championship of the United States Golf Association on June 13, 14 and 15. This will be the fourth major tournament to be held at Canterbury and the second National Open—the first one being won by Lawson Little in 1940.

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AND OTHER KEY
METROPOLITAN DAILIES
ACROSS THE NATION**



MEETING FAILS