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Green Section **RECORD**



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Cover Photo:

Dr. James B. Beard (center) accepting the 1989 Green Section Award from Marion B. Farmer (right), former USGA Executive Committee member, and F. Morgan Taylor (left), Chairman of the USGA's Green Section Committee.

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James B. Beard Receives USGA Green Section Award for 1989

DR. JAMES B. BEARD, internationally recognized turfgrass researcher and educator, has been named the 1989 recipient of the Green Section Award of the United States Golf Association. Dr. Beard received the award on February 13, 1989, at the annual banquet of the Golf Course Superintendents Association of America, in Anaheim, California.

"I'm thrilled. This is one of the big ones," noted Dr. Beard when informed of his selection. F. Morgan Taylor, Jr., of Hobe Sound, Florida, Chairman of the USGA Green Section Committee, presented the award to Dr. Beard on behalf of the United States Golf Association. He noted that "there could be no one more deserving of the Green Section Award, which recognizes distinguished service to golf through work with turfgrass, than Dr. James B. Beard."

Indeed, Dr. Beard's accomplishments and contributions to our understanding of turfgrass science have touched the professional lives of turfgrass managers, researchers and educators throughout the world. In addition to his wide-ranging research achievements, Dr. Beard has authored or co-authored seven books or manuals concerning all phases of turfgrass science and management. One of those books, *Turf Management for Golf Courses*, is a major reference text for golf course superintendents, and was published in cooperation with the Green Section. He has also published more than 100 scientific journal papers and has authored more than 300 technical and popular articles throughout his career.

Dr. Beard graduated from Ohio State University and received his Ph.D. from Purdue University in 1961. He joined the faculty of the Department of Crop and Soil Sciences at Michigan State University in 1961, responsible for teaching undergraduate and graduate-level courses and establishing an extensive research program. His research on evapotranspiration, winter injury, wear stress,



Dr. James B. Beard

and shade effects on turfgrasses were pioneering efforts in these fields and helped establish the scientific basis for many of the turfgrass cultural programs in use today on cool-season grasses.

In 1975, Dr. Beard moved to Texas A&M University as Professor of Turfgrass Science in the Department of Soil and Crop Sciences, a position he still holds. Here, his research work has led to a greatly expanded understanding of turfgrass rooting, heat and drought stress mechanisms of turfgrasses, and winter overseeding practices. His research on turfgrass stress mechanisms has been a cornerstone of the USGA Research Committee's recent efforts to develop grasses for golf that use less water and exhibit improved stress tolerance. Since moving to Texas A&M, Dr. Beard has become a champion of warm-season grasses and has significantly broadened our understanding of how to manage these grasses on golf courses throughout the southern United States.

Dr. Beard's contributions to turfgrass science and the game of golf are truly international in scope. He has lectured

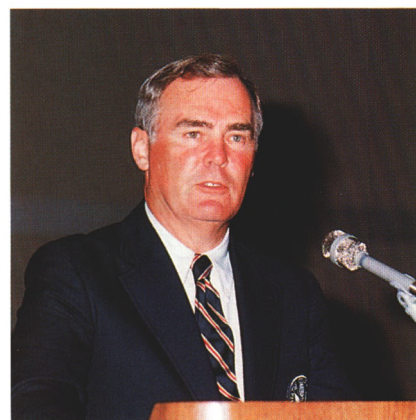
on every continent where fine turf is grown, and his works have been interpreted into several languages. He also played a major role in establishing the International Turfgrass Society, and organized the First International Turfgrass Research Conference, in 1969. This has evolved into a major international research conference held every four years.

One of the great legacies for golf from Dr. Beard's 30-plus years of educational activities is the hundreds of students now in the turfgrass industry who have gone through his programs. Many of the 25 students who received Masters and Ph.D. degrees from his graduate programs now hold key positions in industry and the academic world and are playing influential roles in training the next generation of turfgrass managers and educators.

It is rare indeed to find an individual whose productivity matches his great abilities. Even a cursory glance at his accomplishments in the fields of research, education, and administration would make it clear to anyone that Dr. James B. Beard is just such an individual.

Getting It All Together For Another Golf Boom

February 13, 1989, Anaheim, California



F. Morgan Taylor, Jr.

FOR THE EIGHTH CONSECUTIVE YEAR the Annual Green Section Education Conference was held in conjunction with the Golf Course Superintendents of America International Turfgrass Conference and Show. This year more than 1200 people attended the Green Section program on Monday, February 13, at the Anaheim Convention Center in Anaheim, California. F. Morgan Taylor, Jr., of Hobe Sound, Florida, Chairman of the USGA Green Section Committee, introduced the morning's program of 19 speakers who addressed this year's theme, "Getting It All Together For Another Golf Boom." With hundreds of golf courses being built in the United States and hundreds more under construction around the world, the theme of the Educational Program was most appropriate. Following are the full proceedings.

THE BEST TURF TIPS OF 1988 — PART I

One of the most popular annual features of the Educational Program is the Best Turf Tips. This year, nine of the Green Section's agronomists reported on some of the ingenious innovations they came across while visiting golf course superintendents in every part of the country during 1988. We begin with Part I. Parts II and III appear later in this issue.

"Home on the Range"

by LARRY W. GILHULY

Director, Western Region, USGA Green Section

*Where seldom is heard
A discouraging word,
And the skies are not cloudy all day.*

THESE WORDS may have been true for the early settlers of the West, but they certainly don't apply to today's heavily used golf course practice ranges.

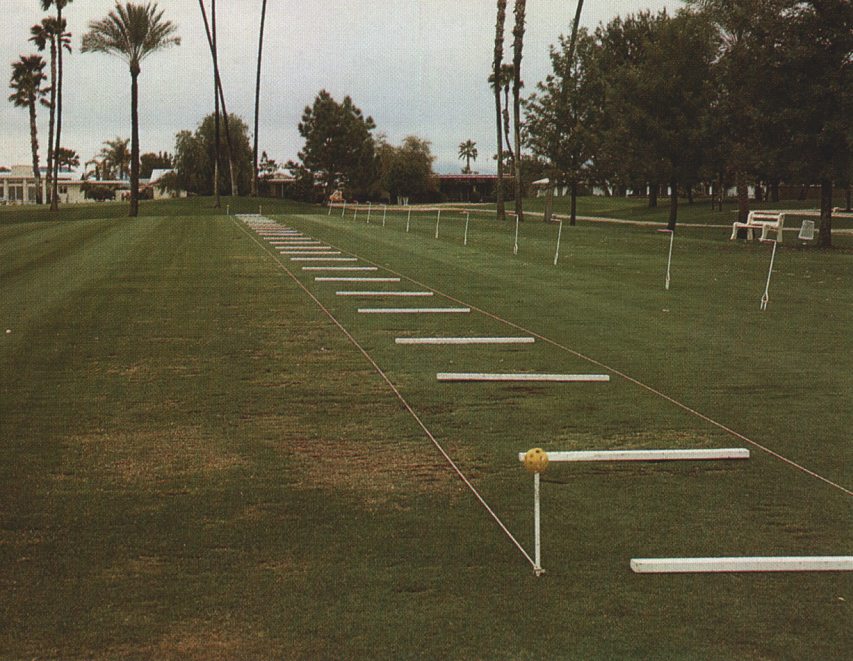
Fortunately, on visits to golf courses in the West over the past few years, several ideas have taken shape and are beginning to improve the turf quality on practice range tees. Combined into a working package, these ideas can provide outstanding playing conditions, with only a moderate increase in expense and little increase in labor.

This simple program of improving turf quality begins with controlling where the golfers may practice. Ropes should be placed approximately seven feet apart across the width of the tee. After the ropes have been placed and anchored into the soil so they cannot be moved, individual practicing stations should be established approximately 10 feet apart. This can be done with various dividers, but placing bag holders and small buckets of topdressing for divot repair at regular intervals is especially effective.

Once these boundaries have been established, the method of rope movement must be very precise. Players generally tend to favor the right half of each

practice station. With this in mind, moving the individual stations in a sideways pattern following one day's use allows two days of use in each seven-foot-wide area. The ropes must be changed after each two-day period. Rather than consuming seven feet with each move, the ropes can be moved to use approximately four feet at a time. This can be done since the players also tend to shy away from the ropes when they're practicing. By following this rope movement pattern, a practice tee 40 yards deep can last as long as 60 days before the pattern is begun again.

While this program will help to distribute traffic evenly, the key to long-term success is the frequency of overseeding.



(Above left) Control of golfers and systematic rope movement are keys to a successful practice tee program.

(Above right) Use of pro shop personnel for daily overseeding is another vital key to success.

(Left) Without daily maintenance, turf conditions will be a problem!

At this point, the question of who will take care of the rope movement and overseeding operations must be addressed. If your golf professional realizes income from the facility, it would seem proper that he participate in maintaining the practice tee. By improving turf quality, more players will use the facility and generate more income for the professional. If this is the case at your club, worn areas on the tee should be top-dressed and overseeded at the end of each day by the person responsible for range cleanup.

This operation is quite simple, with the person using the remaining top-

dressing mixture in the buckets and other seed/soil material provided by the golf course superintendent. When this is done faithfully, the same 40-yard-deep tee will allow two months for perennial ryegrass regrowth before it is used again.

If the golf professional is not involved with the practice tee at your club, the maintenance staff must complete the daily overseeding operation in early morning, before play begins, if labor is available.

As a final note concerning this program, other cultural programs must be practiced to achieve long-term success.

Include a complete fertilizer and organic material in the topdressing mixture to help retain moisture and establish seedlings. Also, aerify the teeing surface at least twice a year with a $\frac{5}{8}$ -inch tine putting green aerifier, and a generous fertilization program should be maintained to sustain adequate turf vigor. Finally, best results occur with the use of triplex mowers, and remove clippings for further improvement in turf quality. The mowing operation can be completed early in the morning, and if rope movement is coordinated with the golf shop, the mower operator can be finished and on to the next job in no time.

Curbing Those Carts

by JOHN H. FOY

Agronomist, Southeastern Region, USGA Green Section



A simple, convenient method to ensure the proper location of tee markers.



Reflectors placed at the edge of cart paths help prevent carts from damaging adjacent turf.

THOUGH some argue that golf course management in Florida is like nowhere else in the country, a number of its concerns are common to all golf courses. The following three items observed over the past year could help provide better conditions for golfers at any course.

Discussions about course maintenance operations almost always include the topic of labor. Developing and keeping a competent staff seems to be a common problem throughout the game. The available work force most often has a limited knowledge of the game of golf, and it is usually good practice to simplify even the most routine course management operations. Tee marker alignment is just such an operation. Although it might be a minor consideration, poor tee marker alignment can contribute to an overall impression of untidiness and poor management.

Mike Bailey, golf course superintendent at The Falls Country Club, in West Palm Beach, Florida, has a very simple means of making sure tee markers are properly and uniformly set. He has developed a T made with PVC which is carried on the triplex unit used for mowing tees. After the operator has finished mowing the tee surface, the T is placed on the ground and aligned toward the center line of the fairway landing area, or at the flagstick in the

case of par-3 holes. With this device, it is easy to determine the proper alignment of the tee markers. Attention to such detail ensures that golfers will find tee marker placement as consistent as possible.

Another problem common to most golf courses is the turf wear along the edges of cart paths caused by golf carts and maintenance equipment. Golfers seem to have a natural tendency to pull their carts off the edges of the cart paths, particularly near tees and greens. Over the years a variety of techniques have been tried to minimize this damage, including permanent curbing, the use of ropes and chains, and the establishment of traffic control flow patterns. Generally these traffic control measures are objectionable, because they require significant work in their application, interfere with other course maintenance operations, or have an unsightly appearance. Mark Black, golf course superintendent at the Bonita Bay Club, in Naples, Florida, has discovered an effective, low-cost, unobtrusive method for controlling traffic along the edges of cart paths. Black has found that small reflector units, commonly used by highway departments, aligned along the edges of the paths reduces the tendency for golf carts and maintenance equipment to operate or park off the paving. The reflectors are epoxied directly onto the cart path surface, approximately two

inches from the edge. Once in place, no additional maintenance is required. Several other courses have taken these reflectors one step further, and are using different colored markers to designate the recommended stopping points throughout the course. This practice is helping improve traffic flow patterns and speed play, especially around putting green complexes, because golfers are not wasting time going back to their carts before proceeding to the next hole.

The final turf tip does not actually involve turf at all. Over the past 10 to 15 years, golf course superintendents have made great strides in improving their image. Sometimes, however, people are left with a very unprofessional image when they try to reach them by telephone. Oftentimes the phone is not answered at all, or the crew member who answers has difficulty in taking down or passing on important messages. A simple way to improve this communication problem is to install an answering machine. As with other electronic equipment, the price of these machines has dropped over the years, and many units can be bought at reasonable prices. A short, simple statement identifying the superintendent and club, along with a message stating that calls will be returned as soon as possible, is an easy way to ensure good lines of communication.

1989 USGA Day

by TIM P. MORAGHAN

Agronomist for Championships, USGA Green Section

AS SUMMER approaches, golfers everywhere begin to assess the talent in the pro and amateur golf ranks, and speculate on who will win the Open and Amateur Championships. Anticipation and excitement run high, especially at the host clubs of USGA championships. Questions on course setup and conditioning are put to the club from all directions. With this in mind, those responsible for course conditions often ask for help. To assist the superintendents at these clubs, the USGA offers them guidelines that can provide the finest conditions possible. The USGA takes the view that a firm and fast golf course will help determine a worthy champion.

Course preparation for USGA championships is quite different from the routine for daily play, and it requires time to reach peak conditions for the event. Although most of the American golfing public equates fine playing conditions with lush, deep green, manicured turf, this is not true. The simplest way to describe championship conditions is to say, **GREEN IS NOT NECESSARILY GREAT.**

To provide lush, green turf, plenty of water is a basic requirement. The more water, the greener the turf will be. Those looking for a lush, green golf course, then, are likely to have a soft, wet course as well.

For best effect, ground conditions for a championship should be firm and fast. Overwatering the putting surfaces, for example, produces soft greens and allows a poorly hit shot to hold. When watering is necessary, only enough water should be applied during the event to keep the turf alive. If syringing is needed, it should be done very lightly to avoid softening the soil. Hand watering should never be done to the point of causing runoff or creating small puddles of standing water.

The need for firm and fast conditions applies throughout the golf course, including the sand bunkers. Although bunkers serve as hazards, they should be conditioned properly. This means producing a firm surface to play from, without the concern of the ball burying in the face of a high sand bank, or end-

ing up in a fried-egg lie. The firmness of the bunkers should be consistent.

Firming the surface and slopes of sand bunkers is simple enough, but it does require a substantial amount of time if the sand is quite soft.

Begin by irrigating the bunker from a hand-held hose with a syringe-type nozzle, making sure to saturate the sand thoroughly. After any remaining surface water disappears, use the wheels of a mechanical sand rake to pack the sand by traveling back and forth and riding up and down any sloped areas. The weight of the machine, in combination with the knobs on the tires, will press down and firm the sand.

Another hint for encouraging the sand to settle: Spray the bunker with a liquid wetting agent at a rate of six to eight ounces per 1,000 square feet every four to seven days, a practice that helps reduce the tendency for the sand particles to "bridge" and remain fluffy.

Finally, the turf area that usually draws more than its share of concerns at USGA championships is the rough.

Players often claim the grass is too high, while club members and spectators claim it is not high enough. The height of the rough turf is decided upon by the USGA's Championship Committee at least one year in advance. The decision is based largely on the type of grass and the event being played. For the Open, which is regularly contested on cool-season turf, the height is usually four inches. When it is maintained properly, cool-season turf grown to this height will penalize a player about half a stroke for missing the fairway and intermediate rough.

The rough should not be so severe it eliminates a fair opportunity for recovery. To produce a uniform, dense, and upright stand of rough turf, up-front rotary mowers are best. The suction created under the mowing deck will stand up the turf and provides the desired results.

Although Open conditions aren't necessarily what you want for your club championship, keep these tips in mind when you're preparing your course for special events.

What happened to my ball?



The International Flavor of Golf Course Management

by JOHN SEGUI, CGCS

President, GCSAA, Waynesborough Country Club, Berwyn, Pennsylvania

IF ONE KIND OF TURF is truly international, it's got to be a golf green. When you think about it, for anyone who plays golf anywhere today, a green is defined at a glance by just a few humble things: a small piece of earth, a hole in the ground, and a modest flag that belongs to no nation. I think that kind of common link is a rare commodity in today's world. It speaks well for the game, and it reflects well on all of us involved in the game, whatever our particular contribution.

The growing popularity of golf around the world demonstrates it is among the most universal of games for adults. Nor is its popularity confined by national borders, language barriers, or particular customs of a country. Just look at the growing interest in golf course construction in such different countries as the Soviet Union, China, Turkey, Portugal, and in the game's more traditional venues as well.

I visited USGA headquarters, in Far Hills, New Jersey, last November, and spoke to a delegation of five Russians who came over to look at some American golf courses. As you might know, Russia once again is in the planning stages of its first golf course. The site is located about 30 miles from Moscow. Although we spoke to one another through an interpreter, it was obvious the Russians had a feel for golf and understood our meaning. It was a great experience for all of us.

During my time as President of the Golf Course Superintendents Association of America, I have shared a taste of golf course management overseas, as well as in this country. In conjunction with a meeting of the British and International Golf Greenkeepers Association, in Scotland, last year, I visited clubs in Scotland and England, where the game originated, and played a couple of courses. One that stands out in my mind was Belle Isle, a course of great natural beauty and challenging rough.



John Segui

For me, both as a superintendent and a golfer, it was deeply thought-provoking to see the differences in management practices between Britain and the United States, and to hear the reasons for those differences. One interesting example I recall was at the Woodbridge Golf Club, where we played in a tournament. After decades without trees on the course, the members have become concerned because some have sprung up recently, and many of them have grown to unaccustomed height.

How they became established is an interesting story. For many years there was a great abundance of rabbits in that part of England, and the rabbits prevented trees that grew naturally from surviving because they ate the leaves off the seedlings as soon as they broke ground. About 15 years ago a disease epidemic killed about three fourths of the rabbits, and as a result the trees gained about a year's growth before the rabbits recovered. Now the club has what the members consider an overabundance of trees, and it appears the club wants a tree-removal program to put the golf course back to its original state. Isn't that something? In this country we try to grow trees, while over there they cut them down.

I learned recently that construction work has begun on an 18-hole championship layout in Ismear, Turkey. This course, which will be the country's first full-sized high-quality contemporary layout, is also the first one built to accommodate Turkey's already booming tourist industry. If all goes as projected, it appears that additional regional development could bring new courses to Istanbul, Ankara, and the Aegean and Mediterranean coasts.

During my stay in Scotland and England I met many superintendents from all over Europe, and the same boom in golf course construction is occurring over there. They are building golf courses as fast as they possibly can. England is about to get its first all-bentgrass golf course. The plan calls for the course to be maintained in what they consider the American style. It will certainly be a change for them.

Switching to the other side of the world, Japan continues to take up the game at a rapid pace. In Hawaii I met Ken Ogerly, who represents Japan's equivalent of our National Golf Foundation, and he told me the Japanese are blowing away the sides of mountains to build courses. On another course, the completion of one hole requires a tram ride to the next tee. The Japanese are truly ingenious. It will be very interesting to follow the evolution and development of golf course management in these unfamiliar sites during the next decade.

Even though course management practices affect golfers' attitudes, and operating budgets often differ greatly from country to country, the feeling of camaraderie among those responsible for maintaining the courses as well as those who fancy themselves to be golfers have been much the same wherever I traveled. Those feelings truly give course management an international flavor today. I know I enjoy the feelings I have during and after a good round of golf with friends, whether I play well or not.



(Above left) And you thought your rough was tough!

(Above right) Don't miss the fairway on this hole.

(Left) Golf is a common bond among players throughout the world.

I also get a good feeling from the job I do as a golf course superintendent, maintaining a course so that others can enjoy it. In speaking with members of other superintendents associations around the world, I have found that more and more of us share those same sources of enjoyment. It is a common denominator that bonds us all. The place of our courses in our communities and the contact with people are inseparable parts of the joy of the game. Let's hope we can continue to cultivate this good feeling for the game as we improve the maintenance practices on our courses in the years ahead.

IT'S A MATTER OF OPINION

It's certainly safe to say that opinion varies widely on many subjects having to do with turfgrass science and golf course management. Following are three speakers' opinions on three controversial topics. See if what they say doesn't make you stop and think!

What They Don't Teach in Turf Schools

by **JAMES A. JOHNS**

Golf Course Superintendent, Northmoor Country Club, Highland Park, Illinois

WHEN I LOOK BACK and see what was being done on golf courses as recently as 10 years ago, and compare it to what is being accomplished now, I get a good look at how much the turf business has really changed. If I would have said to another superintendent at that time that I was going to establish a program of mowing my fairways with a triplex greensmower and collect the clippings, he would have said I had been out in the sun too long. Today, though, mowing fairways with lightweight mowers and collecting the clippings has become standard on many golf courses.

Jim Latham, the USGA's regional agronomist in our area, came to Northmoor Country Club for our annual visit last September. During his tour he noticed that two of my greens showed strange color patterns, and he asked me what had happened. I told him that during the week before his visit I had my turf placement student come back in the evening to fertilize the greens. We regularly fertilize in the evening so we don't bother the golfers, and it also allows me to water in the fertilizer in conjunction with my evening water cycle.

As it turned out, the student had misconnected the electrical wires on the spreader, causing the spreader fan to rotate backwards. The fertilizer was spread unevenly, causing a light and dark green striped pattern to show up a few days later.

Let me explain that this was not the turf student's first experience fertilizing greens for me; he had fertilized three times previously. I had explained that afternoon that he must take time to connect the electric spreader to the back of the vehicle that would be used to apply the fertilizer, making sure that everything was ready to go for that



James A. Johns

evening. He had been shown in previous training operations that the spreader should be tried on the parking lot each time to ensure that it was functioning properly before he began on the greens and tees. Most importantly, I had explained to him that an ounce of prevention is far better than the pound of grief you get when the job is done poorly.

As we all know, everyone notices mistakes made on the golf course, and it is the superintendent, not the turf student, who will be held responsible. If the damage is great enough, it could cost him his job.

Don't misunderstand and think that I'm saying that all the problems on the golf course are caused by turf students, because that is not the case at all. The young turfgrass students I have worked with have been very good and willing workers. The young man learned a lot from his experience, and it is not one he

will soon forget. As it turned out, no great damage was done, just a little color variation on the two greens, and a very worried young man.

The problem I have found with turf placement students is that while they may have a great educational background after completing school, which is very, very important, they lack the important hands-on experience that is so necessary to be successful in this business. I believe colleges and universities should offer more hands-on work at local golf courses to allow the turfgrass students more of the necessary practical experience before they are graduated. It should not be the job of the golf course superintendent to provide all of the practical training.

I have also found that some of the students coming out of the turfgrass schools believe working on a golf course for a couple of summers while they complete school will prepare them to be an assistant for a year or two, and then move right up to the head superintendent job at some big-paying club.

Landing a good job just does not happen that way at all. Nor should it happen that way. It takes a lot of time, dedication and hard work on the golf course, gaining experience in every type of job from raking bunkers to setting up greens and tees for daily use, to the management of the work crew. Managing a crew of workers today takes a lot of time, personal understanding, and maturity. It is probably the most important job of the golf course superintendent. The young turf student can learn from school, but managing people comes instead from practical experience.

Somehow, colleges and universities have to find a way to balance a good technical education with good field experience.



(Left) This scene could have been avoided if the applicator had taken a closer look at the herbicide label.

(Below) Experienced help usually avoids problems like this, caused by the overlap of a herbicide application onto the edge of the green.



The USGA/GCSAA Research Program: Receiving and Disbursing Research Funds

by **J. R. WATSON**

Vice President/Agronomist, The Toro Company, Minneapolis, Minnesota

THE 10-YEAR USGA/GCSAA Research Program has reached its halfway point, and much has been accomplished. New grasses, new information systems, and new cultural maintenance programs are in use, and the program has great potential for ever more significant gains in the next five years. Administratively, much has gone on behind the scenes to get us where we are.

Funds that support the USGA/GCSAA Turfgrass Research Program are authorized and supplied by the USGA Executive Committee. For the most part, these funds were raised in conjunction with the USGA Capital Campaign. Individuals, corporations, clubs, golf and golf-related organizations designated or directed their contributions be used for this purpose. Contributions are still needed, and they are still being received.

Specifically, the Research Committee agrees on projects to be supported, establishes priorities, and allocates funds according to specific guidelines. A



J. R. Watson

budget is prepared and submitted to the Chairman of the USGA's Green Section Committee (F. Morgan Taylor, Jr.), who in turn submits the budget to the USGA Executive Committee for approval or revision.

From 1983 through 1988, approximately \$2.25 million was granted and invested in turfgrass research projects at 28 universities. In addition, the Turfgrass Information File, at Michigan State University, has been established and is on line.

Historical

A brief discussion of the program and how it was developed may help to clarify how the funds are disbursed.

In 1982 the USGA Research Committee was formed and charged to seek ways to counter the anticipated reduction in availability of natural resources, especially water and energy, and at the same time find methods that would reduce the increasing costs of golf course maintenance. The committee was given 10 years.

Following several meetings, the committee identified specific objectives and defined the programs needed to accomplish them. The committee

recognized at the outset there would likely never be enough money or time to accomplish everything of value in turfgrass research, and that it would have to adhere strictly to the stated objectives in its decision to allocate money. Furthermore, any research proposals given serious consideration would have to be specifically directed toward the stated objectives.

To accomplish the mission, two simple yet challenging objectives were established. Simply put, they were:

1. To reduce water use on golf courses by 50 percent.
2. To reduce golf course maintenance costs by 50 percent.

It was clearly recognized that to accomplish these objectives, cooperation and coordination in three areas would be necessary:

1. Development of new grasses.
2. Introduction of new technologies.
3. Establishment of educational resources to provide turfgrass professionals the information needed to adapt the grasses and technologies to their own use.

The USGA program would contribute, but it could not be expected to solve these problems alone.

Disbursing Funds

To support the objectives, funds have been allocated to five major categories. They are plant stress mechanisms, turfgrass breeding, cultural practices, computerized turfgrass information file, and administration.

As the committee wrestled with the techniques and procedures needed to accomplish its mission, it became quite clear that a multi-discipline research project would have to be directed toward development of new species and varieties of turfgrasses. With no criticism of past plant breeding and selection efforts intended, it was apparent that most of these had been directed toward grass species exhibiting a broad germplasm base, and developed under highly favorable growth conditions, usually with high moisture and high fertility regimes.

The USGA was looking for grasses with lower fertility requirements, good drought and salinity tolerance, and tolerance to high and low temperatures. At the same time, the new grass would have to be of high quality for golf.

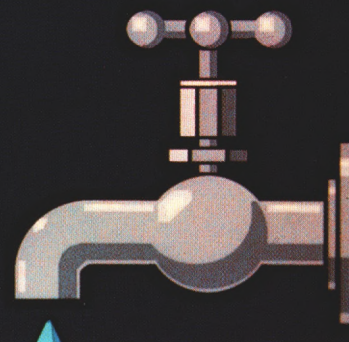
Stress Mechanisms

To begin with, scientists understood few of the mechanisms by which turf-

Overall Objectives

✓ 50 Percent Reduction
in Water Requirements

✓ 50 Percent Reduction
in Maintenance Costs



The USGA/GCSAA Research Program.

grass plants tolerate stress, making it difficult for them to use modern technology to hasten breeding new cultivars. New information about plant stress mechanisms was required to develop an elite breeding pool based on rapid and easy selection procedures.

Dr. James B. Beard submitted a detailed research proposal and laid out a road map dealing with plant stress mechanisms. It was accepted. Now in its final stages, the program has substantially enhanced this area of turfgrass knowledge. A few items on the original plan are yet to be accomplished.

Through 1989, the committee has disbursed in excess of \$528,000 for this study.

Grass Breeding and Selection

Grass breeding projects were deemed to be the most time consuming, but they were also the most essential segment of the entire program. The approach would embody at least three areas:

1. Evaluating stress tolerance cultivars selected from currently used species.
2. Making selections from native species currently surviving and growing in adverse conditions and in environments hostile to normally used turfgrass species.

3. Developing new cultivars through conventional and emerging bio-engineering technology.

Previously funded, long-term programs under the direction of Drs. Glenn Burton, of the University of Georgia; Joe Duich, of Penn State University; Reed Funk, of Rutgers; and Dick Skogley, of the University of Rhode Island, have continued to receive funding. Added to the list were the programs of Drs. Arden Baltensperger, of New Mexico State; Robin Cuany, of Colorado State; Milt Engelke, of Texas A&M; Charles Mancino, of the University of Arizona; Terry Riordan, of the University of Nebraska; William Rumball, of New Zealand DSIR; Charles Taliaferro, of Oklahoma State; and Don White, of the University of Minnesota. In addition, Dr. Jeff Krans, of Mississippi State, has received limited support.

Disbursements to these projects to date has totalled \$434,000, and by the end of 1989 it will reach \$703,000.

Cultural Practices

From the outset it was recognized that new and old cultivars would have to be evaluated for future turfgrass usage in terms of their minimal main-



Dr. Charles Taliaferro (third from right) and Dr. Mike Kenna (right) at Oklahoma State University, receive a grant check from William Bengeyfield (left), Chairman of the USGA Research Committee, and Dr. James Watson, Research Committee member. Work at OSU is dedicated to producing a cold-tolerant, seeded type of fine-leaf bermudagrass.



The development of new, stress-tolerant grasses is a major goal of the Research Program.

tenance characteristics and their cultural and maintenance costs.

Some 14 projects have been selected to support this effort. They include studies by Drs. Branham, Michigan State — management; Brauen, Washington State — management; Carrow, University of Georgia — management; Colbaugh, Texas A&M — pathology; Danneberger, Ohio State — heat stress physiology; Horst, Texas A&M — techniques to determine salinity tolerance and to qualify salinity tolerance levels; Krans, Mississippi State — plant morphology; Lucas, North Carolina State — pathology (note: this project was funded by Hall Thompson); Petrovic, Cornell — mycohrizza symbiosis; Shane and Nameth, Ohio State — pathology; Shaw, UC Riverside — kikuyu grass selection (note: this project is a cooperative effort with the Northern and Southern California Golf Associations); Sherman, University of Nebraska — cultural practice interactions; Smiley, Cornell — pathology; and Vargas, Michigan State — pathology.

Through 1988, \$357,000 has been disbursed in support of these efforts; through 1989 the total will exceed \$462,000.

Turfgrass Information File

The Turfgrass Information File is a bibliographic computer database designed and developed under the direction of Dr. Roy Chapin and Peter Cookingham, at Michigan State University. It is unique. It covers turfgrass literature of all kinds, including works on turf culture as far back as 1906. The database provides access to approximately 14,000 records, with an additional 2,000 new references added each year. The records include a wide range of technical and popular literature concerning turfgrass research and cultural and maintenance topics.

Access to the collection is provided through computer by the USGA-TGIF. With an IBM PC, or a compatible system, and communications software, the database is accessible 18 hours a day to those who subscribe for an annual fee. To those without access to a PC, staff personnel are available to assist with search strategies and to send the searched materials. Response to most requests is made within 48 hours.

Through 1989, expenditures for this project will exceed \$414,000. Funding of this project is expected to decline as new subscribers are added and the use of this resource increases.

Administration

Administrative costs for the Research Committee are minimal. Members receive no compensation for their contributions of time and effort. Expenses are for the usual legal counsel, printing costs, and committee meetings, including an annual meeting with research leaders in one or more of the research categories. Legal expenses are incurred in the negotiation of contracts and agreements.

Administrative costs are also incurred as a result of monitoring visits. Committee members are assigned to visit project leaders, review and monitor progress against the project objectives, and mutually agree upon future direction. Monitoring visits include discussion with project leaders, department heads, deans, graduate students, and technicians. Visits and subsequent reports and studies generated by the chairman of the monitoring visit are shared with those who are concerned, and are highly beneficial to both parties. Additionally, committee members become acquainted with project supporting personnel, the techniques, and the graduate students, who are tomorrow's leaders.

Funds Disbursed Through the USGA Research Committee

Category	1983-88 Expended	1989 Projected	1983-89 Total
Stress Mechanisms	\$ 460,500	\$ 67,800	\$ 528,300
Turfgrass Breeding	894,285	337,000	1,231,285
Cultural Practices*	365,123	105,500	470,623
Turfgrass Research Library	354,326	60,000	414,326
Administration	144,285	70,000	214,285
Total	\$2,218,519	\$660,300	\$2,878,819

*includes biotechnology category

Administrative funds disbursed through 1988 were \$144,000 and will reach \$214,000 by the end of 1989.

Disbursement Summary

For the first five years (1983-88), total funds disbursed have amounted to approximately \$2,200,500. Through 1989, the sixth year of the 10-year program, disbursements will approach \$2,800,000. We thank all who have contributed, participated, cooperated, and supported this effort, and those who will continue to do so.

Six Grasses — One Golf Course

by **TOMMY WITT, CGCS**

Austin Country Club, Austin, Texas

PETE DYE designed and built an extremely challenging, very aesthetic golf course for the Country Club of Austin, in Austin, Texas, in 1984, at its new location in the hills west of Austin, along the Colorado River. In addition to creating a spectacular design, Dye established a combination of different grasses, several of which had never been used in central Texas.

Dye chose to establish Penncross bentgrass on the greens, 419 bermudagrass on the fairways, 328 bermudagrass on the tees, centipede in the roughs, St. Augustinegrass on the aprons, and a mixture of blue grama, buffalograss, lovegrass, and bluestem in many of the waste areas. Because of its poor playing qualities, though, much of the St. Augustinegrass has been replaced with 328 bermudagrass.

As you can imagine, dealing with six different grasses on one golf course presents quite a challenge, requiring a number of turfgrass management considerations.

The Penncross greens were established on a 100 percent sand base, with the severe undulations and contours so typical of much of Pete Dye's designs. The seedbed varies in depth from 8 to 30 inches, making irrigation management extremely difficult.



Tommy Witt

To make matters worse, the course is located in very hilly terrain, and several of the greens suffer during hot weather from poor air circulation. The combination of consistently high relative humidity, very high summer temperatures, and over 43,000 rounds of golf each year makes this course as much a challenge as any golf course superintendent would want.

The bermudagrasses are well adapted to the area, and they present no maintenance or playability problems to speak of. The St. Augustine, on the

other hand, has been poorly received by the golfers, and has caused many problems as collars bordering our bentgrass greens. Not only can the golfers not easily negotiate chip shots from the St. Augustine, but the water requirements and management practices needed for bentgrass and St. Augustine are so dramatically different, keeping them both in good condition is nearly impossible. Brown patch and leafspot are the major disease problems we encounter with St. Augustine, and the encroachment of this grass into the aprons, tees, and fairways is an important concern.

Because of heavy play, the centipede grass in the roughs is rarely given the opportunity to reach an optimum or quality condition. This grass species simply cannot tolerate the traffic, and as a result, the leaf blades turn a reddish color and become thin and worn. Normally preferring a lower soil pH, the centipede does not prosper in the 8.5 pH soils native to the area. Although several sulfur applications are made each year to reduce the effects of the high pH of the soil and irrigation water, results from these efforts have been minimal.

The grass species used in the waste areas, such as grama, love, bluestem, and buffalograss do very well. These



A view of the various grasses when they are all in optimum condition at the same time.

A view of grasses when they are not in the same quality condition at the same time. The centipede rough goes off-color earlier in the fall than the bermudagrass.





A mixture of native grasses such as grama, love, buffalograss, and bluestem are established in the waste areas.



Centipede and St. Augustine proved to be ineffective on collars as far as playability and wear tolerance were concerned.

grasses appear at home, and they require minimal maintenance. Buffalograss turns a brown color without regular irrigation, contrasting noticeably with the dark green bermudagrass fairways, and making the area look unkempt and neglected.

Dye used such a variety of grasses on the course to produce an interesting contrast of colors and textures. Each grass naturally produces a different shade of green and has a characteristic growth habit. During the several weeks of the year when all the species reach their optimum condition, the appearance is extremely impressive, just as Dye had envisioned. The fairways, roughs, greens, and aprons are all different shades of green, and the golfers' target areas stand out. Unfortunately, this effect occurs for just a brief period each year, leaving the course in a rather disheveled state during most of the season.

Several years of working with these grasses has led me to draw some conclusions:

- Not all these species are well adapted to local soil and climatic conditions.

- The consistency and appearance of the course is very difficult to maintain because of the reaction of the different species to seasonal weather differences.

- Mowing patterns are limited by the distinct mowing needs of each grass species.

- Certain species produce better playing surfaces than others. St. Augustinegrass should not be used in important play areas.

- Each species needs specific management practices. Maintaining good quality turf under such conditions requires a high degree of supervision and a good team of qualified maintenance personnel.

- Not all species tolerate heavy traffic. Those that don't should be used only in less trafficked areas.

In conclusion, selecting grasses for golf courses is not such a difficult task, and it doesn't have to lead to the kind

of experience we've had at Austin Country Club. Several guidelines should be considered:

1. Use grasses native to the area, those that tolerate the local climate and soil conditions.

2. Use grasses that can handle the amount of traffic expected, and then some.

3. Use grasses with qualities and characteristics that will correspond to the type of budget you will be expected to operate within.

4. Use grasses adaptable enough to be maintained for both membership and tournament play.

It is difficult enough for today's golf course superintendent to maintain high-quality turfgrasses and golf courses when native, proved grass species are used, but the task is much greater when grass species are selected for simple aesthetic appeal, rather than basic agronomic needs. In these instances we are operating in an atmosphere where a moment's mistake can result in disaster.

Water for Golf Course Use: The Next 20 Years and Beyond

by **DR. J. L. MEYER**

Irrigation & Soil Specialist, Department of Soil & Environmental Science, U.C. Riverside

CALIFORNIA depends upon moving large amounts of snow melt water from the Sierra Nevada Mountains and the Colorado River Basin to its cities and towns. Most of the Southwest, and southern California particularly, is semi-desert, yet its farmers grow abundant food. Turf and landscape managers provide magnificent landscapes, and conservationists manage many new recreational areas for the rapidly growing urban society.

In southern California, water coming from local wells averages about 15 percent to 40 percent of the total need. The Metropolitan Water District, a large wholesale contractor, moves water hun-



Dr. J. L. Meyer

dreds of miles, importing 60 percent to 85 percent of local water needs. As the wholesale contractor, MWD delivers to 12 member water agencies, which in turn deliver to hundreds of retail agencies, who universally meter water to the 13 million people in the seven-county area.

California will use about 40 million acre feet of water in 1989, or about 13 trillion gallons, which includes water for agriculture, municipal needs, industry, wildlands, and recreation. Since less than 25 million acre feet are stored each year, runoff is captured during the growing season, and wells are used to compensate for the growing needs.

This scene is becoming increasingly common on golf courses throughout the country.





Severe water restrictions placed on golf courses can have dire consequences for their appearance and playability.

As a part of the California State Water Resources Control Boards, the Delta Water Hearings Board proposed reductions in municipal water usage in December of 1988. The trial paper proposed an across-the-board 20 percent reduction in domestic usage by 2010, and an immediate 40 percent reduction on all new landscape and recreational areas. Essentially, this proposal would turn the clock back to 1985.

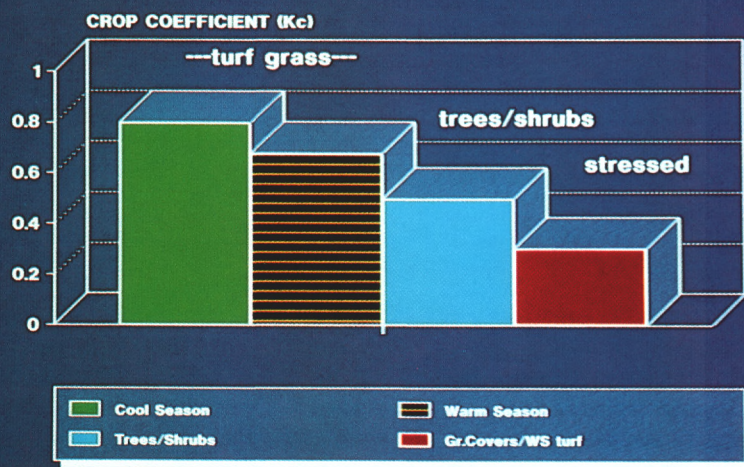
A number of studies by engineering firms and data from MWD indicate that by 1985, per capita water usage in southern California had been reduced to about 193 gallons per day. Nearly 50 percent of the water per capita, however, is used outdoors, indicating Westerners like to live outdoors and have outdoor recreational facilities.

Accompanying graphs are taken from a paper by Dr. Michael Haneman, an economist of the University of California at Berkeley, titled "Reasonable Municipal and Industrial Water Use in 2010." They represent southern California's water use patterns in the decade of the 1980s, and project water use to 2010.

Dr. Haneman notes the retail price of water has risen 35 percent from 1979 to 1986, but indications are that water pricing has not materially affected usage because Westerners live outdoors. Although the State Water Board rescinded its 20 percent reduction order, in February, 1989, further public hearings will be held with a final resolution of urban water use to be implemented in 1992.

Landscape water usage can be reduced, however, by using alternative species, a reduction in turfgrass areas, the introduction of improved cultivars, and improved irrigation system designs. Planting warm-season grasses instead of cool-season species could save a significant amount of water. Soil moisture monitoring devices and weather-generated data bases will also play an important role as southern California looks to reduce per capita water use without being forced to significantly curtail its outdoor recreational activities.

PLANT WATER USE



Part of any water conservation effort must come from the use of plant materials that require less water.

The population in southern California was estimated at 13.2 million persons in 1985, and it will grow to 18.3 million by the year 2010. Municipal water usage in the Metropolitan Water District is presently 2.9 million acre feet per year (nearly 1 trillion gallons) and is projected to grow to 4 million acre feet (1.3 trillion gallons) by 2010.

The decades ahead are sure to bring greater water problems for southern California and other parts of the South-

west. Among the factors that will force municipal and state agencies to further restrict water use are a significantly increasing population, a growing number of single-family homes, and limited water resources and an accompanying lack of water storage facilities. Another important concern is the average Westerner's attitude toward his landscape and his outdoor recreational facilities, making it just that much more difficult to develop water conserving measures.

An Overseeding Alternative — Roughs Only

by PAUL VERMEULEN

Agronomist, Western Region, USGA Green Section

THE DECISION to overseed bermudagrass fairways each fall is often driven by the membership's desire to play on a green golf course during the winter season. This strong desire for green color exists in spite of the excellent quality playing conditions offered by dormant bermudagrass. Unfortunately, what the membership fails to appreciate is that perennial ryegrass overseeding has the potential for seriously inhibiting bermudagrass fairway turf during spring green-up. The damage resulting from perennial ryegrass competition for available water and nutrients in the spring is known as poor spring transition. Furthermore, in order to complete fairway overseeding, the course should be closed for three to five weeks during the fall so the ryegrass can establish itself. In short, the member-

ship is gambling against nature in the spring, and sacrificing several weeks of prime playing conditions in the fall, for the sake of winter color.

On golf courses that don't overseed, it is necessary to prevent the establishment of winter annuals, such as *Poa annua*, with a selective herbicide. While such a herbicide program is highly recommended because it enhances the health and vigor of bermudagrass, there is usually a lack of definition between fairways and roughs, giving the course an unattractive appearance, which in turn generates great uneasiness among the membership. In such situations the superintendent can easily attract a few unkind comments.

An alternative worth considering is to overseed the roughs only. Rough overseeding spares the bermudagrass fair-

ways from possible spring transition problems and gives the entire course an exciting appearance during the winter season. In addition, interruption of play during the fall for fairway overseeding and establishment is minimized, because the fairways are left open for regular play.

In order to be successful with this overseeding alternative, two prerequisites are necessary. The first is to have an irrigation system that can water the rough independently of the fairways. The second is that the fairways must have adequate drainage. These two prerequisites are necessary to prevent the dormant fairways from becoming waterlogged during the winter.

Give this overseeding alternative some serious thought as you plan ahead for next year's winter color.

Overseeding the roughs instead of the fairways produces excellent definition while avoiding many of the pitfalls of fairway overseeding.



Poor response of bermudagrass during the spring transition is one of the drawbacks of fairway overseeding.



Turf Groomers: Good for the Grass, Good for the Game

by **STANLEY J. ZONTEK**

Director, Mid-Atlantic Region, USGA Green Section

GOLF COURSE superintendents face a very real dilemma with putting green speed. At one end, better golfers often demand fast greens; at the other extreme, the not-so-proficient golfers prefer "greens with some grass on them." To these high-handicap golfers, greens that hold are much more important than greens that are fast.

Complicating the decision are the agronomics of putting green management. While closely cut greens generally putt faster (since there is less grass on them), they are also more difficult to maintain during periods of stressful weather. On the other hand, higher cutting heights help grass survive these periods of stress, but they have a negative effect on putting green speed. Thus, the golf course superintendent faces a problem. Should he go for very fast greens and risk the health of the turf, or play it safe with the turf and risk incurring the wrath of the better golfers?

Fortunately, my Turf Tip offers a mutually beneficial compromise. The new grooming attachments for today's putting green mowers allow the golf course superintendent to maintain a reasonable cutting height that is good for the turf, yet allows green speeds to be kept in the range that golfers prefer. This is one piece of equipment that has lived up to its advanced billing.

Essentially, groomers act as mini-verticutters. They remove a small yet significant amount of excess leaf tissue, thereby reducing the leafiness, stemminess, and grain so common on most grasses used for putting greens today. Greens cut with a groomer program generally roll smoother, truer, and faster than greens cut without it. Although it sounds almost too good to be true, I found it to be so.

As with any tool, groomers must not be overused. Care should be taken to monitor their daily use on the clean-up lap around greens and during periods of extreme stress. Their use should be re-

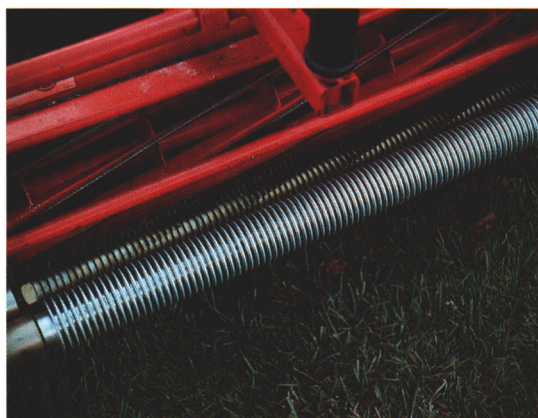
duced or deferred during periods of extreme heat, humidity, and drought stress, or when common sense suggests they are no longer needed.

These attachments are not panaceas, nor are they designed to compensate for poor putting green management practices. They are a useful tool for today's golf course superintendent who must balance doing what's best for the grass and what's best for the game.

(Below) Bill Milsop, superintendent at the Old York Road Country Club in Spring House, Pennsylvania, is smiling because he now has groomers to better manage his grass and putting green speeds.

(Bottom left) Groomers are available for several types of greensmowers.

(Bottom right) Are we cutting our greens too close? The better color occurs in the slightly depressed turf in a wheel mark . . . a sure sign of mowing the grass too short.



A Technique for Dealing with Soft Sand

by JAMES T. SNOW

Director, Northeastern Region, USGA Green Section



A cement finisher has proven to be an ideal tool for firming new sand in recently renovated bunkers at the Bridgehampton Club.



The application of water to the newly installed sand produces an ideal base on which the cement finisher can move.

REPLACING old bunker sand with new is often a traumatic experience. The removal of the old sand and its replacement with new is time consuming for the maintenance crew and costly for the membership. In addition, once the sand is in place, many golfers find its playing characteristics different from the old sand.

The length of time it takes for golfers' complaints to subside depends in large part on the degree of softness of the new sand, a factor that depends on the shape of the sand and its range of particle size. Certain sands can remain too soft for months or years, while others firm up in days or weeks. Anything the golf course superintendent can do to make new sand firm, even if the effect is somewhat temporary, is appreciated by the golfers at most courses.

Scott Bertrand, superintendent at the Bridgehampton Club, in Bridgehampton, New York, discovered an unusual and successful technique for developing instant playability for bunkers filled with new sand. He knew from experience with various construction projects that a cement finisher (a steel plate mounted to a gasoline-powered engine

that produces a compacting effect by vibrating horizontally) can produce a very firm base of sand on which bricks can be laid for a patio, for example. Using this principle, he reasoned that using this machine on fluffy sand that has just been placed in a bunker should provide the golfers at his club with a firm, playable surface without having to wait months for the new sand to settle. Needless to say, his idea worked very well.

Scott found several little tricks that could be successfully employed to make the work go smoothly.

After spreading four to six inches of new sand in the renovated bunker, lightly water the sand before running the machine over it. He found that the compactor tends to bury itself in dry sand, but it glides nicely over damp sand.

In using the sand available in eastern Long Island, where Bridgehampton is located, Scott discovered that one pass with the machine produced perfect results. He cautions, however, that bunker sands are quite variable from area to area, and some sands might require more or less compaction to achieve the desired results.

He suggests that others go once over their sand, and then test it to determine if further compaction is needed. Test the sand by walking through the bunker to get a feel for the firmness and consistency, and hit a few shots to help determine its playability. If possible, have the club professional or one of the good golfers participate in the test.

If by chance the compactor has made the sand too firm, it is easy to loosen the top inch of sand with a hand rake or riding mechanical rake, producing just the desired effect. Thereafter, avoid cultivating the bunker too deeply to minimize the possibility of softening the sand too much. Eventually, fine soil particles and organic debris will begin to contaminate the sand, and a natural firmness will develop.

Scott Bertrand's technique for firming new bunker sand is one that does not require a large inventory of expensive equipment. Cement finishers can be rented by the day from local equipment rental companies for a very reasonable cost. For newly built courses or older courses where major bunker renovation work is being done, the club might consider buying such a machine.

Things To Do Before Contacting A Golf Course Architect

by **NEWELL O. PINCH**

Chief Executive Officer, Southern California Golf Association

ASKED MY VIEWS on the subject of things to do before contacting a golf course architect, I could think of no organization that over the last 10 years has had as much exposure to this topic as the Southern California Golf Association, through its own organizational objectives, and inquiries from many miscellaneous clients.

A week rarely goes by that we are not asked for advice or assistance in buying an existing golf course facility or building a new one.

The National Golf Foundation states its research shows we need to build one



Newell O. Pinch

golf course a day for the next 11 years to meet the demand of the expected growth of golf in this country.

In considering the development of a golf facility, one should carefully analyze the reasons behind it. This is a very big business, and we have often seen emotion play a major part in someone's becoming involved in the operation and/or ownership of a golf facility. These people love the game, and they want to be associated with it in some way. It is unbelievable the number of people who get started through this emotion, and then make horrendous mistakes because they have no foun-

The 11th hole at the Captain's Course (Massachusetts). Before . . .



During



dation for making good business decisions.

I feel I can help save some future developer from making foolish mistakes. With careful planning and through sound fiscal management, the developer can produce a better product for the user of the golf course.

While each golf course project is unique, a thread of logical steps runs through the fabric of any sound project. Through our experience we've defined 10 logical steps to follow.

To analyze these 10 steps properly, you must realize that no single individual is capable of interpreting all the criteria that must be considered in developing a facility. In my opinion, it takes a team comprised of four types of individuals, each of whom contributes financial, legal, construction, or golf course operation knowledge.

Since this is a large project, it calls for many varied types of decisions. I once told my wife the development of a golf course creates many problems. She quickly informed me that you have no problems, you have challenges. Well, a

lot of challenges lie ahead when you analyze the golf course business.

First the committee must determine the type of facility to build. There are three kinds of facilities. The first is primarily a land development or housing project. It often begins with a public or semiprivate golf course that is eventually converted to a private course within a housing development. The second type of facility is a pure public course. The third type is a public golf course tied in with a lodge or hotel, which would place this facility in the category of a resort.

From these three types of facilities, I have focused on the pure public golf facility.

Second, the committee must determine the number of holes to build. This discussion will be limited to 18, 27, or 36 holes. Our financial analyses have shown that 27 holes is the most lucrative facility, considering land and maintenance. You will do better financially with 36 holes, but not that much better than you do with 27 holes. You must therefore evaluate land availability and

cost, and review what you wish to accomplish.

Third, the committee must evaluate the site. Various items must be addressed in deciding on a given site.

Some of the most prominent items to review:

- The access of water, in the form of domestic, well water, and effluent.
- The availability of utilities such as power, gas, and sewers.
- Access roads and secondary roads.
- Earth moving. This can be extremely expensive, and you must determine if you can balance the earth moving on site.
- The quality of the soil.
- Environmental concerns. This should be reviewed carefully to find sensitive areas such as marsh lands, coastal areas, and areas of exotic plants or animals.
- Other environmental factors, such as heat and wind.
- Climate concerns of the area.
- The source of players is important. Are players located in the immediate area, or is this site in an outlying area

And after, with superintendent Dave Robinson.



where development will eventually grow around it?

After reviewing all these considerations, the final step is to tie up the property. Do not negotiate for your site without some sort of a letter of intent that will protect you for a given period while you review the other challenges and decide if this is truly a viable project.

Fourth, and most important, develop a financial analysis. This to me is the key to the entire project. It should be created through the combined input of your four committee personnel. The financial analysis study should be placed on a computer, allowing easy updating of information and easy access for computations. Roughly 13 schedules should be included in the analysis. In brief, these schedules include cost of construction and financing charges, projected operating expenses, and projected income. The financial analysis study should be based from the first year through as many years as you wish to project. The financial analysis should indicate whether the project is a go or a no-go, and is a vital document for securing financing.

Fifth, select a legal firm. Before selecting one, you will be able to obtain some basic legal opinions from your legal committee representative. In selecting a legal firm, however, choose one that is easy to work with, that writes very simple and clear legal documents, and is involved with only the legal, not the business phases of your operation. Lawyers specialize in many areas. Select a firm with real estate law experience.

Sixth, it is very important to determine the type of course or courses you will build. We have selected the public golf course. Consider first and foremost a design that will lend itself to reasonable maintenance costs.

I am a big believer that your golf course superintendent should provide input in this area. Without unduly restricting the creative freedom of the golf course architect, the superintendent should be involved in the review of the design of the proposed facility.

The playing difficulty of the design is another feature that must be considered. It is no secret that a public golf

course must accommodate a maximum number of rounds, whatever that figure is, as determined by the financial feasibility study. Speed of play is very important, not only as it pertains to the number of rounds played in a day, but also for the personal satisfaction of the golfer. The playing difficulty and speed of play have a definite bearing on return play. In operating a public facility, you must count on return play.

In constructing 36 holes, or for that matter, 27 holes, I strongly recommend that the three nines — or the 18s in the case of a 36-hole facility — be designed for similar playing difficulty. You do not want a player to come in for his starting time and hear him say, "Oh no, you didn't put me on the South Course again." The facility should be so designed that it would make no difference to a player which combinations of courses he plays.

Cart paths must be considered in the design, and there's obviously a lot of controversy concerning mandatory use of cart paths. Pay attention to curbs around tees and greens to ease turf maintenance.

Seventh, obtain a good feasibility study or market analysis study. This study reviews information such as population trends, comparable facilities, and income trends. In brief, this study advises the developer of the potential market for the type of facility proposed.

The market analysis and the financial feasibility study are important in obtaining a source of financing. Select a reputable firm, one that is recognized by financial institutions, to perform the market feasibility study. In the hotel business, the firm of Laventhol & Horwath is such a company. A comparable type of firm should be sought in the golf course market.

Eighth, financing. Let's face it, golf courses are something of an enigma to financiers. They don't understand them, and they aren't sure how to appraise them. The market analysis and the financial feasibility study will help the potential lender. The governmental approval process places a high importance on your strength to finance the project. Governmental agencies frown on developments that are abandoned for lack of financing.

Ninth is what I term the governmental process. This centers primarily around the selection of an individual or an organization that will guide you through the process of filing the proper applications for the development, through the hearings, and through final approvals by the local governmental agencies. Select this individual or firm carefully. The selected party will in turn suggest the other consultants who will be needed, such as civil engineering and environmental consultants.

Tenth and last, select a building architect. The committee member who has construction experience, together with the committee member who has golf course operation experience, can determine the type of clubhouse and maintenance facility you should design. The key here is to build the type of clubhouse that is functional for both employees and players, and a maintenance facility that is efficient and functional.

The golf course superintendent must play a major role in advising the architect on the design of the maintenance facility. In addition to discussing the proposed building with the golf course superintendent, call on your regional office of the USGA Green Section for assistance. USGA agronomists have been extremely helpful in providing information from regional and national sources.

In preparing the design of the SCGA's proposed facilities, I have visited many new maintenance buildings. In most instances I was appalled by the lack of design efficiency. The superintendent should provide the building architect with the majority of the design concept. The clubhouse and maintenance facility costs should be included in the financial feasibility studies.

The golf course superintendent should also be asked to guide the committee on the size of the staff and the equipment needed to perform his operation.

Once the golf course committee has answered all of the ten challenges, and has determined that this is a feasible project, the next step is to select a golf course architect who fits the requirements of the project. Finally, be sure your golf course superintendent is on board before you begin construction.

CONTEMPORARY GOLF COURSE ARCHITECTURE — SAGA OR SATIRE?

Controversy seems to follow golf course architects everywhere — especially during a golf boom like we're experiencing now. Are today's architectural styles of lasting quality, or are they more like the fads that enjoy lots of press and then fade into obscurity? Following an introduction by Frank Hannigan, three highly qualified speakers from three different sectors of the golf community give their considered opinions.

by **FRANK HANNIGAN**

Former Senior Executive Director, United States Golf Association

WE ARE HERE to discuss trends in contemporary golf course architecture, and for that purpose we have gathered an unusual panel of three men — a golf course superintendent who also happens to be an excellent golfer; a club professional whose experiences and opportunities to evaluate this subject are unique in that he has been a first-rate player, and as an administrator has been responsible for the selection and setup of national championship courses, particularly the PGA Championship; and a golf course architect with a distinguished record both as a designer and as a leader of his professional organization.

The title of this session, "Saga or Satire?" was selected not by the panel, but rather by the agronomists of the USGA Green Section. It gives us a hint of why we're here. A controversy centers round certain aspects of contemporary golf course architecture, and that controversy rages particularly among the inner family of golf. I would certainly include this audience in that group.

This inner circle often compares contemporary golf course architecture unfavorably with the best works of what some of us think of as the Golden Age of American Golf Course Architecture, which began about the time of World War I and ended with the onset of the Depression in the late 1920s and early 1930s.

I have seen it happen among the best players in the world. It manifests itself in an unusual way. In recent years the courses where we've played the Open Championship have been wildly praised by most of the golfers. On the other hand, 10 to 20 years ago, the same group of people or their predecessors reviled



Frank Hannigan

the same courses because they did not like the rough and they did not like the fast greens.

Now, what has happened is interesting. The USGA hasn't changed at all. We're still using the same courses and setting them up the same way. The players' frame of reference has changed. They are now comparing our Open courses to those they play on the Tour, particularly to the stadium courses of the Tournament Players Clubs. They simply don't like them.

The great architects of this Golden Age, if that's what it was, were Donald Ross, A. W. Tillinghast, Alister MacKenzie, and Seth Ranor. Courses designed by these men not only endure, but they seem to grow in stature. They are pleasant to look at, they are fun to play, and when they're gussied up and made long enough, still make excellent championship sites.

Lovers of these old guys' works claim modern architecture is in many ways extreme. They cite these faults:

1. Their design features are often bizarre and out of harmony with the land.

2. Some architects seem to be off on ego trips. The name of the game seems not to build an excellent golf course, but to attract attention, any kind of attention, particularly so your course is photographed and appears in *Golf Digest* magazine. It's my perception that some golf holes are built today not to be played but to be photographed.

3. Costs are crazy, both in terms of actual construction, and in architects' fees. We hear of fees of \$1 million or higher in a couple of the celebrated cases. The whole thing has grown out of control, they say, and it's a terrible example at a time when what we obviously need are lower construction and maintenance costs, and more public facilities.

As far as the maintenance is concerned, we have common criticism about severe slopes that require hand work, and all that kind of thing. One of our speakers not long ago described his job as trying to maintain a golf course that some people have referred to as an agronomic zoo. As for costs, I think certainly the time can't be too far off when we will see bunkers or water hazards shored up not with pilings, but with Italian marble.

Finally, some people say that the profession of golf course architecture is itself sort of vague and fuzzy. Golf course superintendents have a *bona fide* organization and certification program. People look over your shoulder; a golf course superintendent is somebody with very specific education and training.



Yesterday's horses, wagons, and shovels vs. today's monster earth movers.

This isn't necessarily so in golf course architecture. Anybody can hang up a shingle. This was brought home to me recently on a personal level when a woman called me from California and asked me if I would be interested in becoming involved as an architect in a project in Palm Springs. I said, "I can't even get the water out of my basement, and you expect me to drain a green?" So those are the criticisms.

Now on the other hand, is it possible that today's golf course architects operate in a climate and under conditions that don't permit them to design courses that would rival what some of us think of as the great works of the Golden Age. Are they not often given poor sites, and work under terrific pressure to get in and out as fast as possible to get the thing open?

As for costs, well they probably reflect the market. The architect cannot be blamed for the cost of labor, for the cost of equipment, and for the cost of materials. Moreover, these costs may be, as far as I know, centered entirely or largely on high-profile courses. Those of us who come from these rarefied ivory towers of golf, as a matter of fact, see but a very few of modern American golf courses. For all we know, there are some very sound, basic, good courses being done that simply don't make it into *Golf Digest*. It needs to be said that architects build to satisfy their clients, and if a client says, "I want you to give me a course with the world's highest course rating and the world's highest slope rating," even though that will be a lousy golf course, and it will take five-and-a-half hours to play, somebody will build it for him, and it will draw a

lot of attention — for all the wrong reasons.

Above all, this is a different time, and the motives for building golf courses are different. The 20s was the period of the great boom in member-owned golf courses, and the architect was given just one charge: Go out and build us a good golf course, one we will enjoy playing, a place for pleasure.

Today the motives are different. The time of building member-owned golf courses is over; it's finished. There is probably a conflict between the profit motive and excellent golf. It's as simple as that, but when you have to take into consideration the number of rounds of golf, and the necessity for cart paths, that conspires against good art work. Those are some of the arguments in this world of ours.

A Golf Course Superintendent's Standpoint

by **ROGER NULL, CGCS**

Norwood Hills Country Club, St. Louis, Missouri

ISUPPOSE if you look at some of the architectural gimmicks and fads being used today, such as bunkers shaped like Mickey Mouse, or holes shaped like a mermaid, or greens shaped like a heart, or vast flower beds surrounding an entire hole, or 20-foot-deep bunkers, one might conclude golf course architecture is indeed a satire. To give golf course architects credit, I'm sure if you look past the gimmicks and focus on the overall design, most agree that contemporary architecture is simply the continuing saga that started long ago, when Allan Robertson walked the linksland of St. Andrews, laying out holes in the manner that God created them. It progressed to building courses with steam engines and horse-drawn equipment, and has evolved into today's methods, when huge earth-moving equipment moves mountains to build a golf course.

Golf is in a booming period. Much of the work done by today's well-known architects draws great amounts of exposure through television, magazines, and other information media, and makes an impact on the game and on golf course maintenance.

In the history of golf, different periods of architecture exposed trends and directions that were popular at the time. Today's architecture is no different. Some trends and directions seem apparent.

The concept of target golf has undergone a renaissance, particularly in the resort areas, where courses are being built in deserts, mountains, and wetlands. These designs make use of natural, unmaintained areas. The contours often have quick, sharp lines and features, and the mounding is often marked by steep, severe slopes. These courses are usually exciting to play, particularly for the low-handicap player, although the severity of the hazards and natural area sometimes makes such courses frustrating and too difficult for the average player.

It is one of the misconceptions about target golf courses that they are easier and less expensive to maintain because these natural areas need so little care. I have found that because of the severity of the grades, and the need to keep un-



Roger Null

wanted vegetation out of natural areas, they require a significant amount of hand labor, often enough to compensate for the greater amount of fine turf that must be maintained on more traditional courses. In some cases, the cost of maintaining this type of golf course has exceeded what the architects and owners had originally planned.

Target golf is not a new concept. *Prairie Dunes* (1937) and *Pine Valley* (1922) are both examples of the target golf style. One must remember that these are private clubs, with memberships that recognize the intent of the design. They are not resort or development facilities that must cater to all types of golfers with widely varying abilities.

Another concept being employed by today's architects is multiple free-form tees. Courses of the past didn't need large teeing grounds. As golf grew, though, tees had to grow to accommodate the extra traffic. This was done in the 1950s by building large landing strip type tees. Today's designers are building multiple tees, which enable golfers to play a hole from various angles and distances, creating a more interesting course, and helping accommodate the various golfers' needs and abilities.

Even though the residential development golf course has been around for years, it has been my observation that the architects and developers are doing

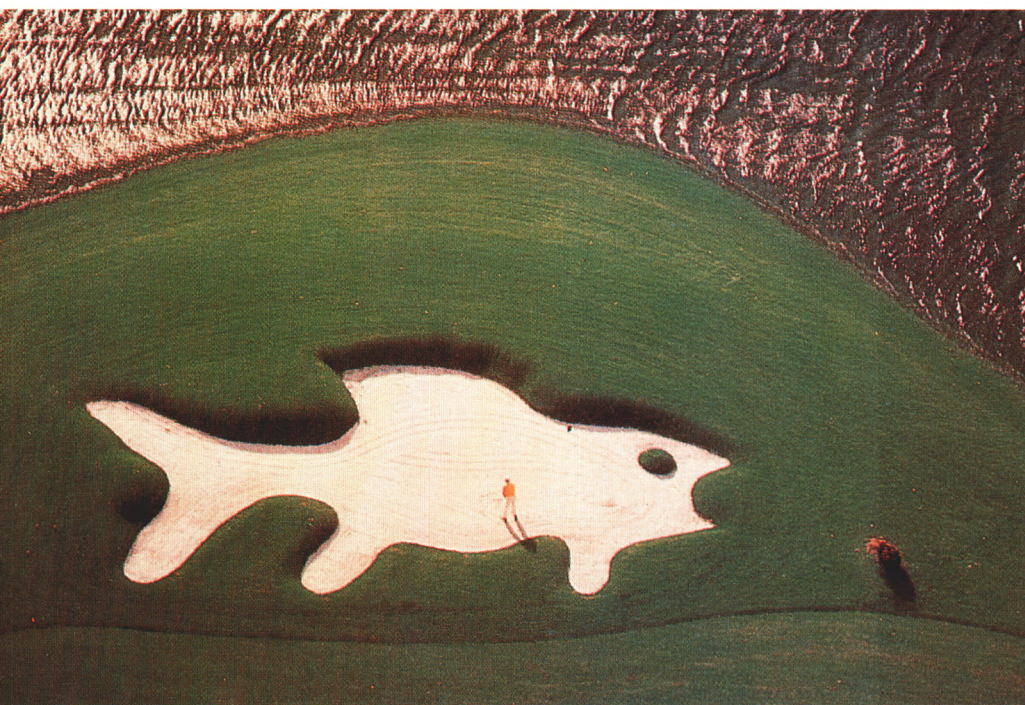
a job of making the frontage properties more compatible with the golf course. A beautiful tree-lined fairway is one of the more pleasurable sights in golf, while a fairway lined with homes, swimming pools, patios, and out-of-bounds stakes is annoying. Development projects today are using mounds, trees, different building materials, and various building styles to fit the property to the aesthetics and playability of the golf course.

More attention is also being paid to construction techniques and agronomics, including drainage, irrigation, grasses, and soil mixes. Unfortunately, shortcuts are still being taken in green construction, involving improper grading, poor drainage systems, inconsistent depths of material, untested materials, on-site mixing, and skipping critical steps such as the installation of the coarse sand layer between the pea gravel and the topmix layers. We have all seen enough disasters with respect to poor green construction methods.

In general, I think golf course construction techniques and specifications are becoming more of a priority to the architect than they have been in the past. I read somewhere, "Golf is played on grass. Grass responds to good management. Good management begins with good construction." Perhaps more than just the superintendents are beginning to realize this.

Practice areas have changed greatly in the past few years, and new areas are being given a great deal of consideration and planning in design. The practice range is no longer an afterthought. New ranges have become learning centers, with greens for putting, chipping, sand shots, and pitch shots, and tees facing in all directions. I think these practice areas are very well conceived and relevant to the times.

Flat bunkers with steep grass banks seem to be a trend in contemporary architecture, reminiscent of Charles Blair Macdonald and Seth Raynor, in the early 20th century. Some have claimed that this style of bunker is easier to maintain, but I'm not sure this is always the case. Mowing steep grass banks doesn't seem a whole lot easier than shoveling sand up bunker faces. I



personally like the Macdonald-style bunker, but I also like the beautiful flashing bunkers that Alister MacKenzie created at Cypress Point, and the Donald Ross wave-like bunkers at Seminole.

Bunkers to me are the accessories to a golf course, just as paintings are to a house. The walls would be bare without them. Bunkers are not just hazards; they help identify the golf course and give it emphasis, texture, and feel. I would hate to see such an intricate part of golf course architecture become too trendy and standardized.

This leads me to the trend of becoming trendy. To build a golf course that

is in vogue, so to speak, seems to be the means to economic benefit. What has happened is that some of the newer, more publicized golf courses have some definite trademarks and styles that have brought certain architects fame and notoriety. There is certainly nothing wrong with having trademarks or styles, but because of their popularity, a large number of owners and developers are asking for a particular look, or trademark, to market their development. This in turn has influenced many other architects to build elaborate, expensive, and trendy courses that look great on a calendar or a sales brochure, but are not always practical and economical to maintain, or fun to play.

In many instances, these elaborate, expensive golf courses have inflated the cost of golf to such an extent that many people just can't afford to play them. To pay over \$100 for a round of golf at a resort course is becoming commonplace. I should think new courses that are less expensive to build and maintain would be a big boost for golf in America.

Many of today's Tour players are jumping on the golf course design bandwagon. This might well be a logical market for them, since their endorsement of a golf course design would be quite valuable for selling the surrounding real estate. There is no doubt that some of these men, through their vast experience playing golf all over the world, have a keen sense of design, and could work well in a team with the right architect. To be a good architect, however, takes years of education, training, and experience in many fields, including engineering, golf, agronomy, business, landscape design, and architecture. I am sure these golfers make a definite contribution to the golf course design business, but I do wonder if the name on the course is the person who actually did the design work.

I would be remiss if I didn't mention the influence of the golf cart on today's architecture and the game. The cart is certainly the direction that American golf is going. It is distressing to consider the percentage of golf rounds on resort and private clubs played with a cart. It would have to be in the range of 90 percent in some areas.

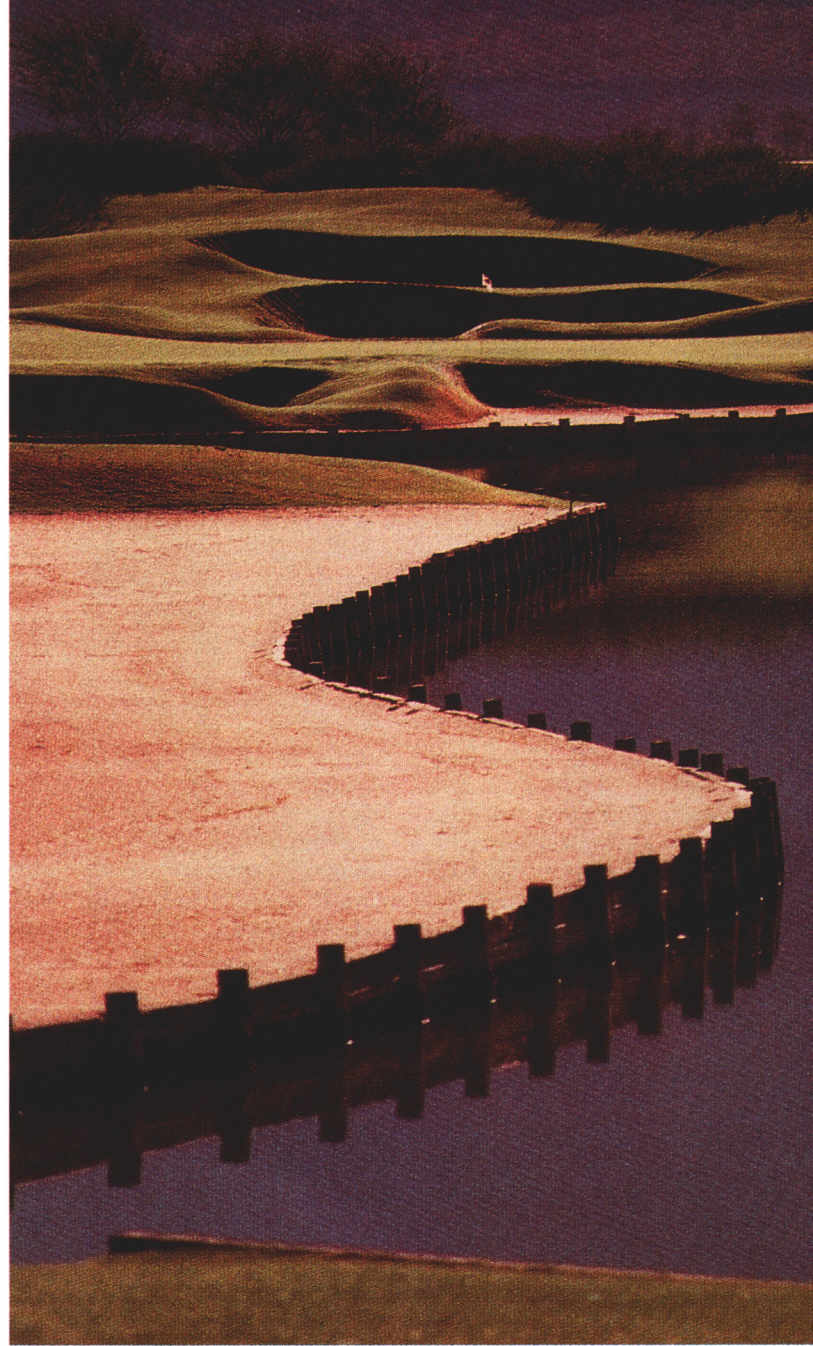
Indeed, a large number of the newer courses are designed to be played strictly with a cart. Although this is due partly to the severe terrain on which the courses are built, and on the amount of acreage needed for housing development, it is also encouraged by the fact that many other courses today do not allow walking. This not only is discouraging to those who enjoy walking, but it goes against the original concept of the game.

This makes me question our priorities with respect to golf. To me there are three priorities in golf: (1) the game, (2) the golf course, and (3) the golfer. In my view, this is the order in which the priorities should be placed. The order has been reversed today, and the golfer has become first priority at the expense of the condition of the golf course and the game itself.

Maybe a trend will develop in the future, and we will see more walkable golf courses. And maybe there will be



Many of today's courses are carved out of rugged, difficult sites.



Striking forms characterize some of today's architecture.

a concerted effort by all of our organizations to rearrange today's priorities and help preserve the image and integrity of the game.

I would like to read to you something written by Peter Thomson, five times the British Open Champion, regarding golf and architecture:

"Golfers in general have a certain passion for their sport which sets them apart. The game they play is not only a physical exertion, it is also a communion with nature and a walk in the great outdoors. For most of us this aspect brings a satisfaction almost supreme. Who has not noticed the

changing season, the cyclic nature of turfgrasses, the birds, and the trees in the course of a year's golf?

"It is easy to see that there is a certain similarity worldwide in all courses, and they vary in degree of beauty and turf quality. Greens come in all shapes and sizes, and bunkers come in various widths and depths. They all belong to a pattern of adventure which is the game itself.

"Golf architecture, like politics, is an inexact science. Almost anything is tolerated as long as it falls within the accepted scale. We do not argue with the absurdity of bunkers by the greens, trees

in the way to the flag, greens as islands in the middle of a lake. Without such things golf would be dull, and would never have grown to its present status and popularity."

Thomson's thoughts ring so very true. We have to remember golf course architecture is an art form; it cannot be bound by rules and restrictions. Fortunately, natural selection applies to golf course design. Good ideas perpetuate themselves. Fads without function tend to die out. That is why our great courses like Pine Valley, St. Andrews, Cypress Point, Augusta, and many others will prevail in the end.

A Professional Golfer's Viewpoint

by **PATRICK J. RIELLY**
President, PGA of America

IN DEFERENCE to the golf course architects of the present and the past, we have to be reminded that God is the first architect. In all fairness to the modern-day architect, when you are provided with a flat piece of terrain in La Quinta, California, you don't have a whole lot to work with in comparison to the Pebble Beaches or Augusta Nationals of the world. But at the same time there has to be a balance between the old and the new. I'm going to relate some of my personal involvement in architecture, and tell of the different factors that had to be considered in setting up the Annandale Golf Club for the Southern California Open, what we in our area consider a major championship.

To digress for a moment, where did bunkering come from? Quite simply, bunkering came from the links concept. In the beginning, the only land that the Scots had that wasn't useful for farming was the links area between the ocean and the more favorable land on higher ground. These were areas that naturally had a lot of sand. When greens and other playing areas were defined, sheep actually grazed on the grass and kept it short. When it became very cold, the sheep would find shelter against the bunkers or the areas next to the green, eat away that area of grass, and ultimately we had bunkers along the sides of the greens.

All architects have a trademark, a signature. Some use bunkering as a key component of their signature. Pete Dye's bunkering, for example, leaves very steep grass slopes that are difficult to maintain. On the other hand, it's very easy to play out of these bunkers, because your lie is generally level, and the sand is generally quite firm.

There are other types of signatures, and every golf course has one. There are the 15th and 16th holes at Cypress, the 18th hole at Pebble Beach, and the 13th hole at Augusta, for example. Robert Trent Jones sort of challenged you, I guess you would say. He had a dynamic heroic taste for architecture, and he made you think about whether it was worth going for the green or not. He was probably the first architect in the mod-



Patrick J. Rielly

ern era who developed that particular form of architecture.

I believe, on the other hand, that Pete Dye's style must have been based on a trip to Prestwick. He took all the things he saw at Prestwick and brought them over to the United States and developed golf courses along these lines. PGA West is something altogether different, but I'm sure he had some specific marching orders and he followed them. It is certainly difficult; it is very target oriented, but at the same time it attracts long lines of golfers. I wonder, though, how much is repeat play. If I were asked to do something in an area like Palm Springs, though, I would probably want to over-build and over-charge as well.

What does all this have to do with the future? The National Golf Foundation suggests that we will have to build a golf course a day between now and the year 2000 to keep up with demand. Given the high cost of building and maintaining some of today's golf courses and the difficulty and time needed to play them, architectural styles will have to change. To meet the demands of the golfing public, golf courses will have to be built less expensively and made more playable. By more playable, I mean you will have to give the amateur golfer a bounce area in front of the green. Sure there should be some shots on a signature hole that demand precise positioning, but by and large, the golfing public needs some room for error.

Architectural style is important in setting up a golf course for one of our PGA events. Generally speaking, we use the same criteria as the USGA. We would like to test every club in the bag, from the driver to the wedge. In dealing with some courses of the modern architectural style, you have to take the driver out of the player's hands. Fairway widths of 25 to 30 yards don't give us much leeway in many instances, and sometimes, because of the architecture alone, it probably will have to be a lay-up hole.

I'll give you some examples. Traditionally the PGA Championship tries to have its greens read between 9 feet and 9 feet 6 inches on the Stimpmeter. Five greens at Oak Tree last August had such tremendous undulations we'd still be playing if the greens had to be rolling 9 feet 6 inches. So we had to change one part of our game, because the greens that week were running at 8 feet 6 inches.

On the other hand, we expect a very different situation at Kemper Lakes this year. It's the first public golf course we've played in many years. We feel it's important that we move the championship around, and that we occasionally use this type of venue. Because of the large greens and lack of undulations, the putting surfaces will probably go between 12 feet and 13 feet, depending on the weather.

To show you what a difference weather makes, consider how the 18th hole at Cherry Hills was set up for the Open in June and the PGA Championship in August. Had the hole been set up for the PGA as it was for the Open, it probably would have been unplayable. The 18th hole has a large water hazard to the left, and the approach shot is played to an elevated green. Play was much more difficult in August, because of strong winds and high temperatures. Had it been set up like a June Open, golfers would probably have been forced to hit a 5-iron off the tee, and then go for an elevated green that was very firm and fast, with speeds around 10 feet 6 inches to 11 feet. The climatic conditions were different, so we put rough down along the left side of the

fairway to stop the ball from running into the hazard.

At Annandale for the Southern California Open last summer, we played a golf course that's one of the oldest in the state. About five years ago the club upgraded the golf course. This involved redoing all the tees and renovating many of the cart paths.

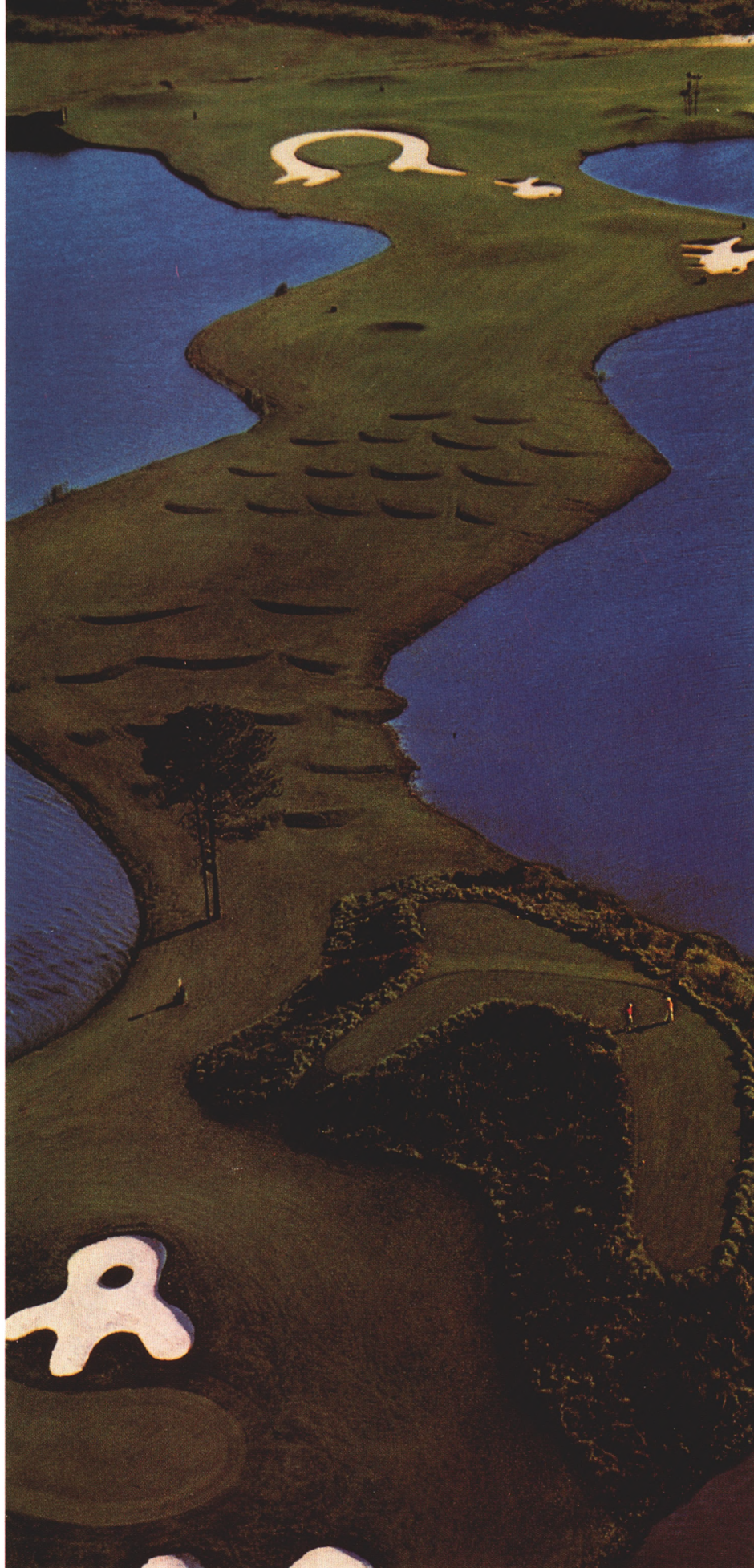
Interestingly, Annandale was the first golf course in the United States to have electric carts, in 1927, so the carts sort of decided where the cart paths were going to go. The cart paths were relocated on four or five holes, the tees were rebuilt, and the greens were redesigned. But we were concerned about the type of stress we can experience in July. Going for fast greens would have meant the loss of turf, and our golf course superintendent might not be there today if that had happened. As a result, we decided to keep the greens at a modest but reasonable 8 feet 6 inches, but we allowed the bermudagrass rough to grow a little, to about two inches, and we were able to maintain the integrity of the golf course.

In our view, the welfare of the golf course is most important, and the concerns of the individual golfer are secondary. Despite the concessions, though, the winning score on a par-70 golf course was 286.

Finally, I want to stress the importance of including the views of a competent golf course superintendent in the construction phase of a new golf course or the renovation of an older one. Our experience at Annandale was a case in point. Even though Dave Alex, our superintendent, warned the architect and committee about the severe slope on the 18th green, his advice was ignored. It appears now that we're going to have to redesign this green, an expense that could have been avoided if the committee had listened to Dave.

We made another mistake in allowing a contractor to install the irrigation system without Dave's supervision. Dave has had to do extensive renovation work on the system to make it functional.

Ultimately, golf course superintendents, golf professionals, club officials, and golf course architects must work together to provide enjoyable golf at a reasonable price. To achieve this, we must avoid the monstrosities so frequently seen on television each week, and concentrate on building challenging courses that are fun to play.



Some golf holes are best viewed from a helicopter or T.V. tower.

An Architect's "Inside" Look

by **ROGER G. RULEWICH**

Golf Course Architect, Robert Trent Jones, Inc.



Roger G. Rulewich

SEVERAL YEARS AGO I recall making what I thought was a profound statement to a friend who had been a client and who was at the time an aspiring architect. I argued that we were entering the golden age of golf course architecture, and he, being a traditionalist of sorts, and a very opinionated one at that, violently disagreed with me. I still think the golden age has arrived, and that we are in the midst of it.

What started this age? What are its characteristics, and where is it going? Economic prosperity, player demand that has outstripped supply, and growing and changing housing markets have provided the impetus for new course construction. From the last boom in the 1960s, when we were building over 350 courses a year, to a low of 100 new course openings in 1980, the pace has now quickened to over 200 a year. If we are to match golf's growth and meet the demands of the predicted boom through the turn of the century, we will need to open at least one new course a day for the next decade. Growth hinges on the creation of new facilities; it is supply driven, and if it doesn't keep pace, we risk turning people away from the game.

Claims have been written lately that we are either upholding, changing, or just plain ignoring the evolution of course design and the traditions of the game. As in any art form, beauty is in

the eye of the beholder. There are a lot of beholders in golf, and they don't keep their opinions to themselves. Curtis Strange says, "We are building crap."

Everyone's perspective is a little different. The pros have to play our courses, and how these courses suit their games understandably affects their judgements. In selecting and evaluating courses as sites for its championships, the USGA applies its own criteria. The various professional tours, tournament officials, sponsors, and the press consider many things when they evaluate courses. The developer and the resort operator probably have different perspectives altogether. While the bottom line of sales stills rules, there is an awakening concern for quality.

Then we must consider the golfers themselves, who pay the bills and support the entire structure of the game. Their perspective is certainly important to the architect, or should be if he wants to create something of lasting value.

Early architects didn't have the critics that we have today. To be sure, their work engendered opinions from all quarters, but their exposure was nothing like it is now. Their courses have existed for a long time, and the critics have been able to refine their judgements over the years. Time is a good test, but is not available to the modern course, the new kid on the block. Familiarity can breed contempt, but with golf courses it more often breeds acceptance, loyalty, and even love. Remodeling work is so difficult for the architect for this reason, because that old hole, green, or bunker has its fans, who are used to it and attached to it in some real way.

This is also the golden age of everything associated with golf, and that is different as well. It's not hard to understand when you consider that the National Golf Foundation has been able to characterize golf as a \$20 billion industry. It's staggering when you think of it, but perhaps not so much so when you consider the spending on equipment, clothing, membership and green fees, travel and accommodations, investments in golf course property, construction, and the maintenance and upkeep of our courses, plus sponsors,

TV, and golfers' support of the professional tours.

With this level of spending, golf promotion has also entered a golden age. The developer, in particular, has a real need to expose golf facilities to potential consumers. This has spawned competitive sales programs, advertising campaigns, and media coverage of all kinds. The number of publications, magazines, and journals available to us is amazing, and, to me at least, overwhelming. I feel an obligation to read them all, but if I did, I wouldn't have time for the design work I love best. So my bookshelf is overflowing with piles of these publications I fully intend to read, but probably never will.

Common to most all of these publications are pictures; gorgeous, mouth-watering pictures of golf holes. Some of the magazines seem to exist for this alone, and if you take out the resort sections, advertising supplements, and tour promotions, hardly anything is left. Golf course photography has become a fine art, and there are dozens of people making a living doing it. Did you notice it was a vintage year for golf calendars with tempting and beautiful pictures of spectacular holes? Even architects published them.

The impact of all this on golf course architecture shouldn't be underestimated. Not long ago the architect was anonymous. Oh, you might see a credit for Robert Trent Jones or Dick Wilson, but even *Golf Digest* failed to mention the architect in its first lists of America's best courses. What a turnaround today when you open up a magazine and find a four-page automobile-style spread asking you to "Drive Our 1989 Fazio." Or almost every advertisement describing a golf course as the latest and finest effort of one of us. Or a publisher devoting his pages to trademarks of the architects included in their top-50 ranking: "Mr. Green Genes," "The Natural," "Mr. Sand Man," "Pinball Wizard," "Old Man River," and so on.

This exposure is gratifying, to be sure, and was aided by writers like Frank Hannigan, with his definitive article on A. W. Tillinghast (*GOLF JOURNAL*, May, 1973) and others who wrote on the

major architects of the 20th century, including MacKenzie, Macdonald, and Ross. The book *The Golf Course*, by Geoff Cornish and Ron Whitten, generated surprising interest, and helps everyone find the architect of his course.

The lists of the "best" courses, which every publication tries to make distinctive, all indicate the architects responsible. Just recently, *Golf Digest*, in four of five issues, featured: (1) "The Dream Short Course," (2) "The 75 Best Resort Courses," (3) "The 75 Best Public Courses," and (4) "The Best New Courses of the Year." These lists have created tremendous interest with the public, and inclusion is jealously sought after by owners, developers, and, yes, architects as well.

The promotional value is not lost on public relations people, and you see ads referring to the list their course has made. A recent ad really stretched the point with a quote from Ron Whitten, of *Golf Digest*: "A possible nomination for best new course honors in '88."

But the perception is that the public is interested in this information and in the architect of the course they might play. This interest in architecture was brought home clearly to me and to the *Golf Digest* editors when they ran the Armchair Architect contest, in 1987. Asked to design a single finishing hole, given a specific site, 20,000 entries deluged the magazine and the judges, of which I was one. *Digest* thought 1,500 entries was about all such a feature would generate. There are a lot of architects out there.

But all of this exposure can be good news and bad news. It is good that the quality of the architects' work is recognized, but it is bad that we are tempted, even pressured, to create courses that are spectacular, photogenic, and difficult to a fault. In the worst sense, it is one-upmanship and status-seeking, but in the best sense it is a striving for quality and distinction. It has brought out a new spirit among the architects. As clients demand more of their golf courses, the architect must stretch his imagination, take on greater challenges, reach for new ideas, and frankly take more chances.

The sites he is given (or selects, if he is fortunate) today are more varied in location, terrain, climate, soils, vegetation, and construction techniques. He is asked to build courses where it would have been unthinkable not too long ago — in the desert, in the mountains, in flat, featureless tableland, in swamps and marshes, and on rocky soils or

where no soil exists at all. Add to this the growing list of environmental regulations and the difficulty of getting permits for building where soil erosion, wetlands, and stream and groundwater contamination are issues. These are critical concerns that didn't exist when many older courses were done.

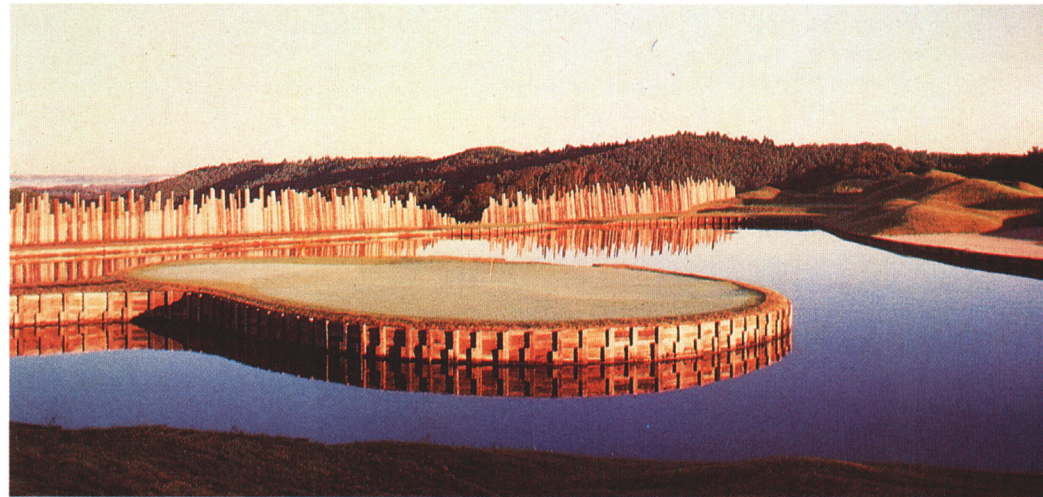
On the other hand, these difficulties and constraints have had strong, positive influences on contemporary design. The modern developer has become familiar with the environmental issues, and he accepts the necessary approval process as it relates not only to the golf course, but to other site development as well. They can see the benefit of preserving natural corridors and open spaces that become real assets rather than liabilities to the overall design. They are not afraid to select sites with physical problems to be overcome, since these will ultimately enhance the character

and aesthetic appeal of the golf course. They ask their environmental planners and golf course architects to define and then solve these problems with methods that create new and enhanced settings for golf.

With these factors influencing his design, the architect is forced to find new solutions, to be innovative, and to stretch his imagination even further. These problems require a non-traditional approach to design. There has been a lot of lip service given to the Scottish influence on both design and the maintenance of our courses. Many new courses are described today as links or dune style, with the more natural look. Anytime you cut back on irrigating, fertilizing, and mowing the rough and non-play areas, it is defended as being in the best Scottish tradition.

Ben Wright, well known British commentator, writer, and now developer of

Rare not so long ago, island greens are becoming commonplace.



golf courses, has some strong words for architects. He says, "It is the ridiculous obsession with what is imagined to be Scottish and traditional that has caused a rash of largely laughable courses," and he adds that "designers should forget forever" this obsession.

Well, architecture has always been and always will be, I think, an eclectic art form. Existing courses, tested and true, have always provided models for playability, shot values, and appealing design. It's not a new idea. George Crump at Pine Valley and C. B. Macdonald at the National Golf Links of America took the British courses which they visited and surveyed as models before they began their designs. The trick is to know how to do it, how to adapt models to new situations, and not merely reproduce or copy existing holes.

Traditional influences are strong in contemporary design, even as new solutions seem to ignore them. In the name of tradition we are borrowing some very obvious elements from the older courses: contour and undulation, pronounced mounding, grassy hollows, steep-faced bunkers, sharp edges, revetted and wood-faced slopes, double greens, longer roughs, and extensive waste areas. These are becoming common on so many new courses, and they've become familiar to all of us through their pictorial exposure. One hole does not a golf course make, but how often we talk of "the picture hole" on our course.

Perhaps we are overdoing it by incorporating so many of these elements. It may be a reaction to that tremendous output of courses in the 1960s that produced to many similar and bland ones. But don't cast too many stones at that era. There was also subtlety and restraint, which is not too apparent on the contemporary scene. The architect today wants to make a statement, to make his course distinctive and different from all the rest. With the exposure he's given today, he is encouraged to experiment, to be more imaginative, and create monuments to himself and his clients.

Certainly we go too far at times, and we are tempted to repeat and exaggerate the look that attracts attention today. We are subject to all the fashions and fads of the times. We want to be trend setters, we have egos, we seek approval, and we enjoy a bit of fame or notoriety. We also want to survive, get new commissions, and pull down the plums with spectacular sites and unlimited budgets. But there is a trap in all this, and it is



Striking, but extremely difficult to play or maintain.



sprung on the players, the superintendents, and even the owners who initially encouraged us.

The introduction of all these eye-catching elements can make extremely difficult conditions for play and upkeep if they are carried too far. We can defend par against the attack of the pros and best players, but we sometimes overlook the average golfer, and the women, juniors, and seniors who have to struggle through the hazards, playing recovery golf, and missing the fun and pleasure of a variety of shotmaking. We are fond of describing our courses as totally flexible, and we say they present a fair challenge to all players, but we don't always achieve this.

What we do is make life very difficult and expensive for the operator. We make maintenance very labor intensive with extraordinary amounts of hand work. Some courses have a full-time crew of eight on Flymos. We create a multiplicity of mowing patterns, make uniform irrigation a real task, create drainage problems rather than solve them, and make a trial of normal operations like fertilizing, aerifying, top-dressing, and spraying.

The industry has responded, incredibly well I think, with the tools to make these tasks easier or even possible. While it's fun to joke about solving the world's unemployment problem with the labor required for course maintenance,

we risk pricing the game out of reach of the average golfer, and discouraging the growth we all want. The architects are also doing things to ease maintenance and enhance their design at the same time. Large or multiple teeing areas give variety to play and avoid wear. Soil and drainage structure on greens and to a lesser extent on tees is vastly improved, thanks in no small part to the Green Section. The phrase USGA greens is still overused and abused, but we're getting there. Solving drainage problems throughout the course during the construction phase is not only a major concern, it is often a necessity when environmental constraints dictate. You all know what hell there is to pay to solve them after the course is in play.

We have more sophisticated control of irrigation. A greater variety of grasses and ground covers are being used. We think new varieties of drought-resistant and low-maintenance turfgrass species the Green Section is developing will open new doors for us.

It seems we are making management easier on the one hand and more difficult on the other. This is inevitably true with so many courses being designed by different architects under different circumstances and for different clients. The trick is to maintain balance in all this. With the means at our disposal to overcome difficult terrain, we can convert a piece of ground that seems unre-

ceptive into a beautiful and playable golf course. The early architects didn't have these means. But these are means to ends, and we shouldn't be carried away with our new technology and capabilities. They're here to serve our purposes, not to dictate them.

Our understanding of the traditions and models of the distant and recent past are brought to each new project. Our previous experience, our knowledge of the techniques of construction, and our own prejudices and egos are brought along with us. I hope we also bring an open mind, and that we listen to people — our clients, the planners and engineers, the managers, and the golf course superintendents.

Believing as I do that this is a golden age, I believe we are succeeding. Time will tell, and later generations of critics will have a better perspective for making this judgement. Any one of us is only getting a hint of what's happening today in contemporary architecture. It's hard to be in the midst of a boom and keep in touch with everything that's going on.

I feel confident that if architects love and respect the game, and listen to the people who play it, we'll keep the boom and the saga alive. These players who enjoy the game, who use and support our courses and create the demand for new ones, will then judge this as the most productive era of creative golf course design.

Pumping and Coring

by JAMES F. MOORE

Director, Mid-Continent Region, USGA Green Section

THE CENTRAL THEME of the tips gathered from superintendents in the Mid-Continent region this year is one of cooperation. As the popularity of the game increases, so will the need for the golf course superintendent to make his maintenance operation more efficient. He will have to stay abreast of new technology, evaluate its value for his club, and then convince his membership of the need to acquire the "new and improved" version.

The same increase in play will bring about a corresponding decrease in the time available to the superintendent to maintain the course. This will occur despite the agronomic concern that as traffic increases, so too does the need to perform vital cultivation practices, such as aerification.

A little more than a year ago, Ed Huggins, the superintendent at Indian Hills Country Club, in Kansas City, Missouri, realized the pumping station on his course would have to be replaced. With both pressure and volume varying widely throughout the irrigation cycle, accurate irrigation was practically impossible. Like many conventional designs, the large electrical motors were either running at full capacity, or completely stopped regardless of the constantly changing demand of the irrigation system.

Ed and Jack Robinson, his green committee chairman, began their search for a replacement station. They chose a new technology in golf course pumping plants, the VFD or Variable Frequency Drive. Sometimes called a VSPS, or Variable Speed Pump Station, this type of design may well revolutionize golf course irrigation. The motors and pumps turn only as fast as needed to meet the demand of the irrigation heads. Computerized control allows for far more efficient use of electricity and stabilization of pressure.

Ed and Jack together convinced the membership it was time to replace the

old station with the new and improved design. As a result of their combined effort, the VFD was installed. To meet the challenge of the severe drought of 1988, the new station pumped 53 percent more water than in 1987. At the same time, Indian Hills realized a 35 percent reduction in electrical usage. Most important, Ed can now supply water to his irrigation system in an accurate and efficient manner.

A second example of what can be accomplished through cooperation occurred in Denver, Colorado. Like

most superintendents, Dan Pierson, of Cherry Hills Country Club, and Bill Shrum, at Denver Country Club, do not relish aerifying the course and inconveniencing their memberships. Being fully aware of the necessity of aerification, they combined their resources and accomplish the job in as little time as possible. By using six aerifiers at a time, each man was able to intensively aerify greens, tees, and fairways in two days, keeping the disruption to a minimum. Using just one of the same type of aerifier, the job would have taken approximately two weeks.

Ed Huggins and Jack Robinson looking at their new pump station. The newly installed VFD pump station at Indian Hills Country Club.





(Top) A job no one likes to do.

(Above) How to aerify the entire course in two days.

(Left) Working together, Superintendent Huggins and Green Chairman Jack Robinson research a new technology.

Improve Your Timing

by **PATRICK M. O'BRIEN**

Director, Southeastern Region, USGA Green Section

PUTTING greens usually require more frequent irrigation than any other area on a golf course. While routine irrigation cycles are usually set at the main controller, or at a satellite station, a course superintendent often may want to irrigate at other times, such as after a fertilizer or pesticide application. In some cases, for example, the nearest controller for a set of particular putting green sprinklers might be located at a satellite field station with no direct view of the green. To apply water, the superintendent must travel to a field station controller, turn on the valves that control the sprinklers around the green, and hope golfers playing that hole have not come within striking distance. Obviously it can be a disadvantage to lose sight of the area where sprinklers are being used.

Three golf courses in Atlanta have found a solution to this problem. The key device is a 30-minute mechanical wind-up timer which is placed at a convenient location within sight of the

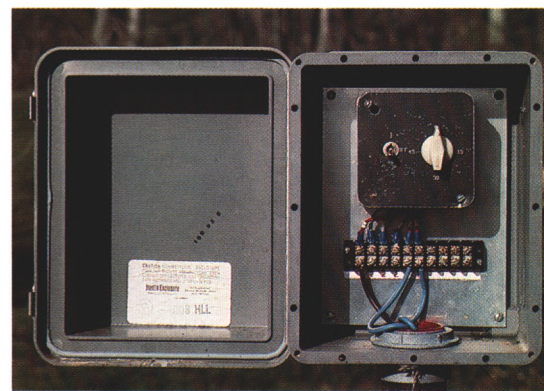
green. The timer is mounted in a fiberglass or metal box and is set on a steel post. Two 12-gauge electrical wires connect the nearest satellite field station to the wind-up timer. The wire connections are made on the terminal strip located in the box, and other connections are made between the timer and the solenoids for the green sprinklers. For golf courses that use both water and mist sprinkler heads, installing a toggle switch will allow easy operation of either sprinkler system. This technique has been employed by Mark Hoban, of The Standard Club, for example.

The wind-up timer enclosure is supported on a two-inch steel pipe, which is mounted on a two-foot by two-foot concrete pad. The 12-gauge wire is the most expensive component of the project, presently costing about seven cents to nine cents per linear foot, so a field station located a long distance from a green will require a substantial amount of wire to reach the wind-up timer. Fortunately, the new, smaller

trencher machines available today make wire installation easy. The wind-up timer system adds about \$5,000 to \$6,000 to a new irrigation system's total cost.

The wind-up timer should be located close to a green, but not so close it distracts or annoys the golfers. If it can be arranged, it could be located on the way to the next green, to further reduce travel time. The fiberglass or metal enclosures should be locked and keyed in the same manner as the satellite field stations. Neither vandalism nor lighting has been a problem at these golf courses so far.

It is important to emphasize that the wind-up timer is not a substitute for a well-designed irrigation system or for a good hand-watering program. The wind-up timer is simply a new water management tool for putting greens. To help you improve the efficiency of your irrigation program and to avoid watering your green chairman by mistake, this tip may be worth consideration.



(Left) Placing the wind-up timer within view of the green and on the path to the next hole helps improve irrigation efficiency.

(Above) A wind-up timer is relatively inexpensive and easy to install.

Clipping Disposal in the Dairy State

by JAMES M. LATHAM

Director, Great Lakes Region, USGA Green Section

THE USE OF lightweight mowing units and the collection and removal of clippings on mixed-species turf in northern fairways has significantly enhanced the spread of creeping bentgrass. In addition, the fairways have a much better appearance, especially when mowing is done in the early morning. The overall result of this operation has been to encourage acceptance of the program throughout the *Poa annua* belt.

The operation is not without its problems, however. What to do with the clippings has been one of the major concerns. Composting and plow-down is possible at a few courses, while disposal by refuse haulers has become a common but expensive practice at others. It has become unpleasantly clear that this harvest of clippings cannot be piled up and forgotten, at least not in areas occupied by humans.

Golf course superintendents in the heart of Wisconsin have looked back to their farming legacy to solve the problem on their courses by using manure spreaders. They are not the types we might picture in our minds, but they are manure spreaders nevertheless. A side-throwing unit is now being used by superintendent Randy Smith at the Nakoma Golf Club in Madison, Wisconsin, and Tom Harrison at Maple Bluff Country Club has a similar machine. At Blackhawk Country Club, Monroe Miller uses a more conventional rear-discharge unit.

In the Nakoma operation, clippings are put in small windrows about 20 feet into the primary roughs along the length of the fairways. These small piles are picked up by a Rake-O-Vac and taken to the maintenance area. There, they are dumped for later transfer into the spreader by a front-end loader.

The spreader has an auger-type feed to a flair-type discharge device on one side, which throws the clippings 40 to 45 feet into the roughs. Clippings are not spread on the same area for two or three weeks afterward to prevent a heavy buildup of clippings in any single area.

Besides saving about \$150 per week for dumpster charges, the clippings



(Top) Clippings are broadcast into the roughs with manure spreaders which have an auger feed to a side or rear-discharge thrower.



(Above) Windrows of clippings are picked up by machine and taken to the maintenance yard for transfer into spreaders.

have some fertilizer value. The machine cost (about \$6,500) is also offset by its use as a soil shredder/mixer.

There have been no complaints by golfers in the two or three years of operation. It is important, though, to be sure no one is in the line of fire. Spreading should be done the same day as the clippings are collected, since they can clump quickly, making the clippings difficult to spread evenly. By the way, there has been no apparent increase of *Poa annua* in these roughs. On Randy's wish list is a ramp setup to facilitate

direct loading of the spreader from the sweeper.

Sources of Spreaders

Knight Manufacturing Corporation
Broadhead, Wisconsin 53510
(608) 897-2131

Knight Slinger #912, side discharge

Akey Manufacturing Company
Footville, Wisconsin 53537
(608) 876-6166

Several models available,
rear discharge

TURF TWISTERS

MAY I ASK A QUESTION?

Question: Do these "Turf Twisters" actually come from your readers or does someone make them up? (A skeptic from Ohio)

Answer: In one form or another, all of these questions do come from our readers. Green Section agronomists cover a lot of ground during the year and receive hundreds of questions. The best ones we record and pass on . . . just like yours! Any more questions?

HOW CAN I KEEP GOOD HELP

Question: I usually hire several college students each summer to work on the golf course, but many times they leave for school or vacation earlier than I anticipate. This leaves me short-handed just at the time when I need the help to aerify greens, renovate fairways, etc. Any ideas? (New Jersey)

Answer: Many clubs have had good luck keeping seasonal workers by offering a bonus or deferred compensation to those who stay on the job until the date that is agreed upon at the time they are hired. A lump-sum bonus can be an especially attractive incentive to college students who are preparing to go back to school.

TO SOD THE BARE SPOTS

Question: Our old *Poa*/bent greens suffered a great deal of turf loss last year. Unfortunately, we do not have a nursery and are facing the spring with large bare areas on several greens. If we sod the bad sections, the texture and color of the new bentgrass sod will look very different from the long-established *Poa*/bent turf on our greens. What should we do? (Virginia)

Answer: Assuming that all of your greens are constructed similarly, one solution would be to strip the sod off your worst green and use the best material to sod the bare areas on your other greens. This would enable you to match soil and grass types while avoiding distinct patches of different turf. You could then rebuild or regrass the remaining green. It would not look like the other greens, but at least it would present a uniform appearance.