THE problem of adequately meeting the drainage situation on the golf course while safeguarding the natural beauty of the grounds is common to many clubs throughout the country.

The River Oaks C. C. (Houston, Texas) faced the necessity for a new drainage system for its course when it was found that an open gully into which a 24-in. drain emptied was eroding three fairways and threatening the supports of a wooden bridge. The storm water, after running through the gully which flanked the eighth and ninth fairways near the clubhouse, passed by pipe under the eighth fairway to pour into another open ditch which crossed the fourth fairway and carried the water to the Buffalo river bordering the grounds.

Water had been cutting away the sides of fairways eight and nine, and had caused the toe of the bank in front of the fourth tee to cave in. It was also undermining the bridge which spans the depression from the third green to the fourth tee.

In determining what steps should be taken to remedy these conditions it was borne in mind that the new system must

Map of the River Oaks C. C., showing location of various improvements to the drainage system.
John Maguire, greenkeeper, behind one of the corrugated iron catchbasins. The lightweight, flexible construction lowered the final cost of installation.

care for the 24-inch drain and surface storm water and, at the same time constitute an improvement from the standpoint of beauty.

The final plan, which was carried out with very satisfactory results, called for a storm drainage system fitted with catchbasins for taking care of the surface water, and the filling in of the open gullies. Because of the ease and economy with which it could be installed and its durability record which insures a low cost per year of service, Armco corrugated iron pipe with catchbasins fabricated from the same material was chosen as the drainage structure.

The improvement program was divided into three units labeled as A, B and C on the map for identification.

Work was started at the gully A by providing for the surface storm water and the water from the already existing drains which had this gully as an outlet. This was accomplished in the following manner: At the upper end of the gully 72 ft. of 18-in. pipe and 14 ft. of 24-in. pipe which connects a line of the old system with the new, empty into a corrugated catchbasin. The outlet of this catchbasin consists of 115 ft. of 30-in. pipe emptying into a second catchbasin near the center of the gully which also serves as an outlet for
**“FRIEND”**

**GOLF COURSE SPRAYERS**

Large—Medium—Small

To protect putting greens, fairways, trees, and shrubs against Brown Patch, Grubs, and all diseases and pests.

A rapid and economical method of applying liquid fertilizers.

“FRIEND” MFG. CO., Dept. G

GASP ORT, N. Y.

---

**NOW WE HAVE IT**

The soil tonic every Greenskeeper Wants

Driconure contains just two ingredients—cow manure from high protein fed cows, and peat moss, so treated as to be free of weed seeds and odorless. It possesses fertilization and humus forming elements which recommend it to every greenkeeper. All the soil improving qualities of cow manure are held available to the plants over a longer period of time by the absorption powers of the peat moss.

50-lb. bags $2.50 F.O.B. factory at Juliustown, N. J.

Per Ton $75.00 F.O.B. factory at Juliustown, N. J.

**DRICONURE**

Atkins & Durbrow, Inc.

Burling Slip, near Front St. New York City

---

**THE RICHMOND SOD CUTTER**

A PROFITABLE time and labor saver that gives a neater Job of sodding.

Cuts a strip 14 inches wide; adjustable, uniform thickness; any length desired.

Makes a smoother, firmer turf especially on embankments. Made for either horse power or tractor.

The Richmond Sod Cutter truly pays for itself in a day—Write us today for details—Complete, ready for use $35 F.O.B. Richmond.

RICHMOND SOD CUTTER CO.

Richmond, Indiana

---

**Try the SIX-BALL CLEANER**

- It does not splash.
- One to six balls at a time.
- Ejects balls when cleaned.
- No gears or springs.
- Avoids delay on tee.
- Requires very little care.

The W. G. Mfg. & Sales Co.

Columbus, Ohio

Use This Coupon For

10-DAY TRIAL

The W. G. Mfg. & Sales Co., Dept. G

Citizens Bank Bldg.

Columbus, Ohio

Send one Six Ball Cleaner. Enclosed is check for $8.50 without standard

$10.25 with standard

If cleaner is not satisfactory and is returned to you in 10 days, you will refund money.

Club

Address

By

Let GOLFDOM advertisers help you. They are golf field experts.
Club Polishers

Rugged U. S. polishers embody powerful motors of 3450 R.P.M.; heavy duty ball bearings in dust-proof, grease-tight boxes, etc. Cable, plug furnished.

(Wheels, as desired, extra.) Specify A.C. or D.C., voltage and cycle when ordering from your jobber or direct from—

The United States Electrical Tool Co.
2459 West Sixth St.
Cincinnati, Ohio

$99

To grow thick and vigorous turf, use V-C FAIRWAY, the fertilizer for golf courses. Clean, inoffensive, unobjectionable — a rich food for grass, easy and inexpensive to apply.

Fairway Grass Food

Virginia-Carolina Chemical Corp.
Lawn and Garden Dept.
Richmond, Virginia

57 ft. of 15-in. pipe connecting the old drain under fairway No. 9 with the new system. This second catchbasin has as its outlet 104 ft. of 30-in. pipe which empties into the existing drain under fairway No. 8.

By supporting the long continuous sections of the pipe at places on temporary props it was possible to place the entire system before starting the backfill which was carried to the top of the catchbasins. In this manner this unsightly gully, made especially obnoxious by its proximity to the clubhouse, was made to harmonize with the otherwise beautiful surroundings of the course.

At location B, 78 ft. of 24-in. pipe was installed to improve the drainage on the lower side of fairway No. 8. This particular installation also served to stop the erosion which had started to undermine a bulkhead at this point.
The third installation of corrugated pipe was made at location C where 320 ft. of 30-in. with vertical inlets to care for surface water was installed. This line begins a short distance above the bridge mentioned above and corrected the erosion tendencies that threatened its supports and continues to a point well below the lower limits of the course. The upstream inlet was built 5 ft. above the stream bed in order to form a stilling pool and raise the gully floor by silt deposits. Provisions have been made to raise the height of this inlet as the gully fills up. By this method, the level of the open stream between the fourth and eighth fairways will be gradually raised to that of the surrounding terrain. The purpose of extending this line below the limits of the course was primarily to prevent erosion and the lower end was left uncovered.

Installation at lower side of fairway No. 8 which stopped undermining of a bulkhead at this point.

By choosing a drainage structure adaptable to the conditions at hand these improvements were quickly and economically effected. The green-committee and other club members are well pleased.
Rutgers Prof. Discusses Weed Control Problem

In his summary of the weed problem on turf, Howard B. Sprague told the green-keepers at the Rutgers University short course:

"Weeds are plants growing where they are not planted. They are frequently more aggressive than turf plants."

According to length of life they are:

- **Annuals** which complete growth in one year and produce seed abundantly. Examples: Crab grass, Goose grass.
- **Biennials** which require two seasons to complete growth, the first being used to make and store food for the production of flowers and seeds in the second. Examples: common thistle, wild carrot.
- **Perennials** which live more than two seasons, usually begin forming seed by the second season. The most troublesome perennials have creeping rooting stems which contain stored food and send up new shoots. Examples: dandelion, plantain, poison ivy, field sorrel.

The sources of weed seed are:

a. Carried by wind, drainage water, and animals, including man.

b. Introduced in fresh or partly rotted manure.

c. Added in top-soil used for top-dressings.

To control weeds:

a. Remove sources of weed seeds.

b. Maintain turf in vigorous condition to prevent weeds from getting a foothold.

c. Close mowing kills many types of weeds; prevention of seed formation in the fairways and the rough by mowing also helps.

d. Use of chemicals, as sprays, or in top-dressing (such as lead arsenate).

Weed Control.

Some troublesome turf weeds and suggested methods of control are listed as:

- **Crab grass**—Warm season annual, spreads by seed. Hand-weed greens in June and July. Use lead arsenate in top-dressings and keep turf vigorous, particularly in early spring and summer.

- **Chickweed**—Dust plants with ammonium sulfate or ammo-phos, water thoroughly 24 hours later, remove dead plants and re-seed.

- **White clover**—Stimulated by phosphorous and potash fertilizers. Undesirable only on greens. Largely controlled by close mowing plus nitrogen fertilization of...
the grass being treated for the clover.

Silver crab grass—Warm season annual, spreads by seed only. Hand weeding in June and July.

Poa annua—Very difficult to control. Keep soil moderately dry and maintain vigor of turf by proper treatment. Use lead arsenate in top-dressing. Hand weeding is only method practicable for complete control and this is very expensive.

Foxtail grass—Warm season annual, spreads by seed. Hand weed greens in June and July. Prevent seed formation on fairways and the rough by close mowing wherever seed heads are formed.

Stink grass—Same as for foxtail grass.

Yarrow—Perennials spreading by rootstocks. When closely mowed makes fine turf. Remove all turf and soil to depth of 3 inches, fill in with clean soil, and sod or replant.

Plantain—Perennials without creeping stems. Hand weed or poison with sulfuric acid.

Dandelion—Same as for plantain.

Poison ivy—Perennials with creeping stems. Poison with sulfuric acid, or spray with calcium chlorate, or grub out roots and rootstocks. Caution: Calcium chlorate applied as spray will kill all other vegetation in the same area. However, the soil is not permanently poisoned and may be reseeded after several heavy rains.

Cleveland Passes New Rules for Greenkeepers

Revision of the by-laws of the Cleveland District Association of Greenkeepers was effected at the April 7 meeting of the association. In line with the association’s determination to make holding of its membership credentials accurate indication of high standing in the greenkeeping profession the organization adopted among its by-law changes: a longer term of apprenticeship, a more stringent examination of the candidate’s knowledge of all phases of golf course operation, and U.S. citizenship.
L. A. Young Co. annual sales meeting brought together all of the Walter Hagen line representatives with the exception of the Pacific coast boys. Appointment of H. E. Mitchell as sales manager to take the place of Glenn Morris, was announced by A. C. Link, vice pres. and gen. mgr. of the organization. The Young tribe passing in review:

**TOP ROW, left to right:** Chris McGrath, New England; W. J. Ring, Mgr., N. Y.; T. C. Robbins, Illinois and Southwestern; A. C. Minkley, Central Eastern; E. E. Chapman, Central; G. F. Goyette, Central Western; A. F. Poinsett, Metropolitan; R. A. Link, Experimental and Design.

**CENTER ROW:** Horton Smith, Mgr. Field Promotion; Thos. Mahoney, Sec. and Treas.; Cliff Mogk, Detroit; L. A. Young, President; C. R. Edmonds, Southern; C. Harders, Production; P. R. Sage, Chicago.


**Glenn Morris Becomes V. P. of Golf Illustrated**

GLENN H. MORRIS, for the past three years vice-president in charge of merchandising for the L. A. Young Co., makers of the Walter Hagen line, has resigned to become vice-president of Golf Illustrated, player magazine of New York.

Morris, a veteran in the sporting goods field, is credited with being a major factor in the marked success which has attended the Hagen line in the golf market. He is a Californian, who was a prominent sport writer before becoming associated with the Wilson-Western Sporting Goods Co., where for eight years he directed the Wilson advertising and sales promotion department prior to joining the Young organization.

Mr. Young bought Morris' stock in the Young company and called in all of the Young sales representatives for a great farewell party staged at the Young home to give Morris an expression of his old teammates' appreciation of his work for and with the organization and to wish him well in his new connection.

**NEW BOOK BY WORTHINGTONS**

Stroudsburg, Pa.—The 1930 catalog of the Worthington Mower Co. tells in practical and helpful fashion for the prospective purchaser, the mechanical and performance details of Worthington fairway and rough gang mowers, the Worthington tractor, Overgreen and Overlawn mowers for greens and lawns, and various other Worthington items of course equipment, particularly their dump-carts, gang rollers and hand mowers.

This book abounds in construction and operation data and is illustrated in an attractive and illuminating style. A copy of the book will be sent free by the Worthington main office or any of the Worthington branches.

**OLDEN VALLEY G. C. (Minneapolis) has issued a general invitation to visiting players who fail to qualify for the National Open at Interlachen to use its course without green-fee expenses during the time of the Open.**
Best for turf because:
—It is a natural grass food and stimulant.
A balanced manure containing 6% Ammonia, 2.50% Phosphoric Acid and 1 to 2% Potash.
It contains no live weed seeds.
Being organic, it aids humus and aids bacterial action.
It can be applied with a minimum of labor and expense.
Being more soluble than other manures, it is more available.
Being finely pulverized, it is quickly absorbed into the soil.

POULTRY
MANURE

PREMIER POULTRY MANURE CO.
327 S. La Salle St.
Joseph Breck & Sons Corp'n, 85 State Street, Boston, Mass.
George A. Davis, Inc., 5440 Northwest Highway, Chicago, Ill.
William P. Philippus & Co., 519 Monroe Street, Toledo, Ohio

DEALERS
Chicago, Ill.
Grenshaw-McMichael Seed Co., E. Broadway at 35th Street, Tampa, Fla.
E. L. Winn, Inc., 355 Jersey Avenue, Elizabeth, New Jersey

A pro’s own
tee proposition
for pros only
the ESTEE
Handsomely packed 18 to a 25¢ retail box.
Pro price $10 a gross of boxes—less your 7% P.G.A. discount. C.O.D. parcel post pre-paid.
Popular design—high grade finish. Stock up NOW.

NORMAN FAUNCE
Mid-City Golf Club
3756 N. Western Ave.
Chicago

QUALITY is THERE
and
A Saving is Effected
in the use of our
Standardized Printed Forms
Clubs that ‘Shop most advantageously’ BUY OF US CONTINUALLY
Let us send your club samples of
SCORE CARDS  GREENS COST FORMS
CHARGE CHECKS  CADDIE CARDS
and Many Other Forms

JOHN H. VESTAL CO., PRINTERS
703 South La Salle Street - - Chicago

EDWARD B. DEARIE, JR.
Golf Course
Architect
Specializing in the essentials of
DESIGN
CONSTRUCTION
SUPERVISION
2407 Central Park Ave. Evanston, Ill.

LEONARD MACOMBER
Golf Course Architect
Engineer, Contractor
664 North Michigan Avenue
CHICAGO

The advertisers pay for your GOLFDOM; deal with them.
The kitchen installation at the Pittsburgh Field Club is said by Manager John Camozzi to be that rare achievement—a golf club kitchen so complete and well designed that it defies alteration.

Answers Manager’s Query on Operating Costs

The inquiry for expression of opinion on the costs of the Erie Downs G. & C., as presented by C. R. Oremus, sec.-mgr. of the organization in April GOLFDOM, has brought forth interesting comments on the food costs. Although the financial statement was not detailed enough to give a positive idea of food costs, it appears that the net food cost is in the vicinity of 68% of each dollar sale. This is high unless there are conditions that don’t show on the statement.

In some way the notion has gotten around among house chairmen that a 50% food cost is right, but many managers of 18-hole golf clubs seriously question this maintaining that the average cost percentage is appreciably higher.

GOLFDOM would like to hear from managers on this subject of net food costs for it is obvious that correction of the generally too low scale of prices for golf club meals depends a lot on the establishment of a safe and sane net cost percentage.

When a club has to start in a modest way, on a small piece of land, it is unwise to attempt the expensive construction of a whole set of holes, but only to go ahead with those that will later blend in with a more elaborate layout.

---

**EVERGREENS**

**AND EVERGREEN BROAD-LEAF, FLOWERING SHRUBS, RHODODENDRONS**

<table>
<thead>
<tr>
<th>Maximum Bushy Plants</th>
<th>Select Clumps, 2 to 5 ft., 10 for</th>
<th>Per 100</th>
<th>Car Lots</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$8.00</td>
<td>$70.00</td>
<td>$350.00</td>
</tr>
</tbody>
</table>

**RED CEDAR and HEMLOCK TREES**

<table>
<thead>
<tr>
<th>Finest Specimens, 2 to 3 ft., 25 for</th>
<th>$7.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per 100</td>
<td>$27.50</td>
</tr>
</tbody>
</table>

Well Packed — Cash Please

THE TENNESSEE EVERGREEN CO.
Box 578
Elizabethton, Tenn.

---

The Peerless Mower Sharpener

Grinds all makes of Power, Horse and Hand Mowers in 20 to 30 minutes, with razor-like edge giving any desired clearance or bevel. Mowers run easier, require less power and gain in speed. One owner writes, "The Peerless Sharpener saves us from $700 to $800 annually." Write for catalog and list of users.

The Fate-Root-Heath Co., 988 Bell St., Plymouth, O.

---

Let GOLFDOM advertisers help you. They are golf field experts.