APRIL, 1938

completed fieldhouse, were G. A. Young, president of the Indiana State Golf Assn., who spoke on problems of the association; "Turf Diseases and Their Control," by Dr. John Monteith, Jr.; "Greenkeeper's Diplomacy," by A. L. Brandon, secy-treas. GSA; "Soil Testing on the Golf Course, Why and How," G. H. Enfield, Purdue U. Dept. of Agricultural Extension. In the afternoon O. J. Noer, Milwaukee Sewerage Commission, spoke on "Recent Developments in Turf Culture." "Insect Control" was discussed by J. J. Davis of the Purdue Dept. of Entomology, and Dr. Montieth spoke on "Research as an Aid to Greenkeeping."

Soil Lab Visited

The first day's activities were concluded with a visit to the university soils testing laboratory, and a banquet in the Lincoln Lodge that evening. Speakers at the banquet were O. J. Noer on "Around the Country"; Herb Graffis, GOLFDOM Editor, "The Editor's Viewpoint"; J. H. Skinner of the Purdue Experiment station, and Carl A. Bretzlaff, state assn. of greenkeepers.

Wednesday's program got off to an early start with T. E. Hienton and R. H. Wileman of the Purdue staff giving pointers on trouble shooting on the course, motors, engines, and mowers. William Diddle, Indianapolis architect, spoke on "Golf Course Design — Building Greens." Dr. Monteith again addressed the greensmen on two topics, "Weed Control," and "Use and Abuse of Water Systems." M. O. Pence, Purdue Dept. of Agricultural Extension, concluded the morning's sessions with a talk on the International Grasslands Congress.

After lunch Walter Lommell, Purdue Dept. of Horticulture, spoke on "Trees and Shrubs on the Golf Course," and in a two-hour panel discussion of greenkeeping were heard O. J. Noer, William H. Diddle, Carl Bretzlaff, George Scarseth, Purdue agronomist, and M. L. Clevett, director of intramural sports. An inspection of the Purdue athletic plant concluded the highly successful two-day greenkeeping session.

TO teach members to smooth out their footprints in traps the Royal Melbourne (Australia) club did not rake the traps for two weeks. The condition of the traps at the end of that time was so god-awful that the members were effectively impressed by the cumulative result of their carelessness.



Here Are Puzzlers Asked at Phila. Superintendents Meet

QUESTIONS submitted at the special Open meeting of the Philadelphia Assn. of Golf Course Supts., held March 7, were so many and covered such a wide range of a greenkeeper's duties. that GOLDOM passes some of these puzzlers on to the greensmen in other sections who should find many of them applicable to their particular situation. We don't know what would be considered a very good score on answering these questions, but if you feel satisfied after reading them over, that should indicate pretty well what you did on the examination. Here they are:

Is it the general belief that fairway watering during summer months will increase the growth of fall grass? ... Is it the general belief that a heavy watering once a week on fairways gives better results than a light sprinkle every night or even every second night? ... What are some of the bad conditions too much fairway watering produces or encourages? ... What is the Green Section doing along the lines of insect pests? ... What effect does the height of cut have upon grass?

Is the golf course acreage in the U. S. recognized as contributing to the solution of soil conservation? . . . Does arsenate of lead on the greens poison the soil? . . . How long will 15 lbs. of arsenate of lead to 1,000 sq. ft. give protection against the Japanese beetle injury to the turf? . . . Can you treat all grass on your course alike and get the same results?

How many diseases attack grass? ... How much seed is needed for a new green of 7,000 sq. ft.? ... Do you find you have less trouble in summer following a severe winter than after a mild one? ... What can the clubs do to find employment for their golf course laborers during the off season? ... In view of the increased surplus of the USGA, should not more money be spent on turf research? ... What is the chief value of phosphorous in turf fertilizers? ... Is there any relation between close cutting of bluegrass turf and the depth of root system?

Which fairway grasses are most readily attacked by turf insects, chinch bugs particularly? . . . Which is the best guide for fertilizer application, the grass or a soil test? . . . Which is the more important: a lime test or a nitrogen test? . . . How often does a grass plant renew its root system? At what period in the year is the supply of plant food in the soil the lowest? . . What is the best method of controlling crab grass on the fairways or on a lawn? . . . Is it still possible to get true German mixed bent? . . . What causes irregular patches in the fairway to dry out more quickly than the rest of the turf? . . . To what extent will sodium arsenite and sodium chlorate be used on golf courses? . . . How much organic nitrogen should we have in our fertilizers for greens or fairways?

Biel Forced to Rest from N. Z. Secretarial Duties

ARTHUR BIEL, hon. secy. of the New Zealand Greenkeepers' assn., is in a hospital with prospects of a year's stay until T.B. is arrested. Biel, like many other greenkeepers, felt he couldn't confine his work to a normal stretch of hours and neglected to ease up long enough to care for a stubborn cold. Biel is philosophical about it. He figures the rest won't do him any harm.

American greenkeepers can take a great deal of fraternal pride in the way their efforts have encouraged and guided colleagues throughout the world. The New Zealand greenkeepers freely acknowledge the tips they have received from the U. S. The New Zealanders, with plenty of financial problems to overcome, have published in booklet form a Report of Proceedings of their Fifth Annual Meeting. It is a valuable reference volume for any greenkeeper's library. Biel and his associates may well be proud of their work for golf.

ONE club allows a member \$10 credit in guest green fees for each new member secured.

A \$10 green fee allowance also was made to each member who paid his annual dues prior to May 15.

WILSHIRE CC (Los Angeles district) is offering two prizes, to sons and daughters under 18 of Wilshire members, for essays on "What Golf Means to Me." Essays will be printed in the Wilshire Club News.

Free Golf to Students—Monthly passes for play on the muny golf course of Palatka, Fla., are issued to local high school students. Passes are renewed each month to students who obey regulations governing use of the course.





KANSAS CITY COUNTRY CLUB William Leonard, Professional



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CLAY BARS WATER SEEPAGE

By ARTHUR LANGDON

IT IS quite possible that one oil field practice may be of aid to the greenkeeper who has streams, dams, dikes, lakes, ditches, or water courses of any kind to maintain. This practice is in the use of a ground clay known as bentonite to prevent seepage of water into the ground and away from its prescribed basin.

In drilling oil wells by the rotary method, mud (clay mixed with water) is forced down the hollow rotating drill pipe from which it emerges through the "eyes" of the bit, picks up the cuttings, and brings them back up to the surface of the ground. Here the cuttings are allowed to settle out and the fluid is recirculated. This drilling mud has several very important duties to perform besides that of cooling the bit and picking up the cuttings. It walls up the freshly opened hole, prevents caving, consolidates loose formations, and checks egress of water from the fluid into the surrounding formations.

Won't Settle Out of Water

As has been demonstrated in oil fields throughout the world, the best clay for this purpose is bentonite. This is due to its many peculiar properties which are chiefly dependent upon its particles being of collodial size and having the ability to stay in suspension in water indefinitely and form gels. As a consequence it will not settle out nor will it allow cuttings to settle out rapidly. Furthermore, and this is of importance in its application on the golf course, it forms a thin, comparatively impervious seal on the walls of the well and most effectively checks the infiltration of water into the formation.

The process may be compared to that which takes place in the filter bed of a city water system. The sand filter, because of its screening action, retains particles suspended in the water with the result that eventually a filter cake is built up on top of the sand of all the solids strained from the water. As the cake increases in thickness the passage of water into the sand is diminished until the time comes when the cake is practically impermeable and must be washed away by reversing the flow of water.

If, instead of ordinary solids, the

water contained sufficient concentration of bentonite colloids, the filter bed would be sealed off so rapidly as to seem almost instantaneous, and only a thin cake possibly less than a quarter of an inch in thickness—would be deposited. It has been demonstrated in the laboratory that this thin cake will withstand a hydrostatic pressure of many thousands of pounds per square inch without allowing more than a mere trickle of seepage to pass through it. On the other hand, only a comparatively slightly higher differential back pressure, perhaps less than 50 pounds, is required to wash it off.

Bentonite receives its name from the Fort Benton formation of the Upper Cretaceous of Wyoming. Presumably it is a volcanic ash. It is widely distributed throughout the United States and is found largely in Wyoming, New Mexico, South Carolina and California. Absorbing several times its own weight in water it will form a jellylike mass. As it is a clay with a pH value slightly on the alkaline side, there is no danger of it harming grass or other plants.

> Valuable as Sealing Agent

Bentonite, when ground to collodial fineness, or so that about 90% will pass through a 200-mesh screen, is an excellent sealing medium; and herein lies its possible value to the golf course which is concerned with the problem of retaining water in dams, reservoirs or lakes, or in disposing of it in streams or ditches. Practice has demonstrated that to seal, for instance, a lake or earthen reservoir or dam which may be drained temporarily, a thin layer of the powdered bentonite should be spread over the water-bearing surface. The more loosely consolidated or fractured the surface is, the more bentonite will be required. Generally speaking, the merest covering, or dusting, of the powder will suffice. It is quite pos-

APRIL, 1938

sible that for purposes of spreading the clay various types of top-dressing machines could be utilized, particularly the kind which are adjustable so as to spread a very thin layer of finely pulverized dressing.

For ditches or stream beds the same procedure may be followed, except that a little more bentonite will be required, particularly where the water is most turbulent.

Where it is impractical to drain the reservoir bed of its contents, the seal may be applied by making a slurry of 2 parts of bentonite to 100 parts of water by volume and pumping this via hose or pipes to the bottom and sides of the water-bearing structure. Being a corrosion resistant and a lubricant, it will not have a harmful effect upon any metal with which it comes in contact. In mixing the bentonite and water there must be no lumps, else much of the effectiveness of the clay will be lost. The more completely dispersed is the clay, the better will be the slurry. If the slurry is left quiescent and is allowed to hydrate for several hours it will set into a gel. This does not render it unfit for use, however, since agitation will restore its fluid properties.

For sealing running streams the bentonite should be scattered along their length. If the stream is very rapid or turbulent, the powder should be distributed mostly at the head of the stream so that the current will carry and spread the clay. Close check upon the bed of the stream should be made so as to determine the effectiveness of the current as a distributor.

Amount to Use Varies

The question of how much of the dry powder to use for the purpose of sealing is a difficult one to answer. Insufficient work has been done with bentonite along these lines to make very definite statements other than that the amount depends entirely upon the condition of the water-bearing formation. The more creviced or unconsolidated it is, the more bentonite will be required. An effective seal can be established in a leaky concrete or wooden reservoir with only a fraction of the bentonite required to check the water loss in a loosely compacted earthen basin. Furthermore, the operator must not expect to obtain an absolutely perfect seal; at all times there

Sand at bottom of test tube is kept dry by layer of bentonite over it.

> water > wet sand > thin layer of bentonite > dry sand >

will be a slight amount of seepage. But the leak after treatment will be only a small percentage of what it was before treatment. Even in a bad case which might require the application of 20 tons of bentonite to one acre of water bed, the cost would be only a fraction of that required to put in concrete. All of which makes bentonite worth considering when it will reduce seepage by as much as 95%.

Where to obtain ground bentonite may be a problem in those areas not containing deposits. Usually it is handled by tale companies or those concerns dealing in non-ferous minerals. In or near oil fields various oil well supply houses can supply either the bentonite or information as to where it may be obtained. It may be of help to know that this clay also is known as wilkinite, taylorite, and armonite, as well as a number of trademark names. The price may vary between \$11 and \$30 a ton.

Greenkeepers may also be interested to know that it is this same bentonite which does remarkable things to cement when used as an admixture. Two per cent added in the dry state to the dry cement will increase the water-cement ratio, eliminate the shrinkage of set cement, increase the tensile strength, add to the bonding strength, render the cement waterproof, and will hold the various aggregates evenly in suspension. Unlike the use of bentonite for preventing seepage, however, this use is patented and is licensed only to those who purchase the bentonite from the various divisions and departments of the National Lead Co.

GOLFDOM

For 19 years I have furnished seed that I grow on my own farms, direct to golf clubs, parks, etc.

BENT GRASS SEED

grown here in New England under its severe, variable, climatic conditions has built up RESISTANCE to the various fungus diseases prevailing in our northern States.

It is, of necessity, WINTER HARDY and makes a fine bladed, permanent, desirable turf for your greens, lawns, etc.

I also furnish a FAIRWAY MIXTURE composed of 5 different varieties of fine turf grass seed which produces a BALANCED, closely woven turf on lawns, tees, tennis courts, fairways, etc.

Purchase your seed direct from the farms where it is______ LIMITED SUPPLY grown, and thus not only save for your club, but KNOW______ "PIPER" STRAIN you are getting high type seed from winter hardy grass._____ VELVET BENT SEED

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Jersey Superintendents Endorse Soil Science Building

NEW JERSEY Golf Course Supts. Assn. met Monday, March 21, at Mountainside Inn for their regular monthly meeting. Guests present were Joseph Ryan, Pres., GSA., and M. E. Farnham, Robt. Pollock, and Thos. Dougherty, all members of the Philadelphia Assn. of Golf Course Supts.

There was considerable discussion regarding the N. J. State Assembly bill 302. calling for appropriation of funds to construct a soil science building at the N. J. Agricultural Experiment Station. There was need of this work 7 years ago, but it was rescinded due to relief needs. The need for this building is new acute, as work at the station has greatly increased, and classrooms are crowded. The N. J. Assn. of GCS unanimously endorsed this bill, as all members are aware of the good work done by the station - there being several million dollars invested in golf courses throughout the state. Robt. Pollock submitted a list of questions asked at the recent Philadelphia assoc. open meeting, and various members volunteered replies. Kent Bradley gave a thumb nail sketch of the recent Fifth Annual Recreation Conference at Mass. State.

The sound film "Beneath the Surface," as put on at the Cincinnati convention, was also shown at the N. J. meet on this date. Johns-Manville's Transite Pipe division was represented by J. M. Evans, R. Lea and A. Bette, who answered questions after the showing of the film. Among the features of this product are non-corrosion, great strength, flexibility of joints, resistance of frost action, and ease of installation.

M. E. Farnham and Joe Ryan gave some interesting highlights on the problem of sod webworm, chinch bug and other worries in their district.

PURCHASERS of \$10 playing tickets are given two golf lessons free at a Western public course that pays its pro a good salary and concessions. The idea has helped sell many tickets, but of course would be a very unfair proposition at a course where the pro was not on a good guaranteed income basis.







67



display room and offices on 11th floor of the Lytton Bldg. Walls are stained knotty pine. Inset shows one of two eye-catching windows fronting elevators.

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The Lytton Building is known far and wide as the golf trade buying headquarters in the Midwest. At no other location will you find so many key names in golf.

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1937 Crop Now Available

Purity -90%, Germination -85%, Other Grasses, 0.1%, Inert Matter-9%. Inquire of your seed dealer, or write us directly

EMERALD FARM, Newton, N. J. (Growers of Velvet Bent Grass Seed)

EDDIE GARRE, veteran Chicago district pro, has a hunch that blindfolded pupils during instruction will acquire the feel of the golf swing more quickly. He says that he has tried teaching while students closed their eyes and is surprised how quickly they progress in establishing a swing on feel instead of on their unique interpretations of how the golf swing should look.

Garre says an experiment along this line was tried in a group class at the University of Illinois. Half the class was blindfolded and the other started to learn the swing with eyes open. The "feel" method developed considerably more good golfers than did the "sight" system.

In discussing this subject, Horton Smith related that an oculist once examined his eves, marvelled that he was such an excellent putter. Horton's explanation is that delicacy of touch must compensate for any defect in vision.

GOLF'S MARKET PLACE

The Kroydon Company, Maplewood, N. J., announce an attractive and spacesaving set-up this season for display of Hy-Power balls and

Kroydon clubs. Clubs will be shown in two light metal racks-one for holding 9 irons and the other for showing 4 woods.

Racks take up little room and can be screwed to the wall; space can be saved by staggering the stands. Clubs are neatly arranged and are readily accessible to show prospects who like to feel the clubs.



A Triple Threat that you can bet, Even your proverbial pants,

A NEW UNION

To keep your greens Brown Patch free,

And also free of ants.

• WOOD RIDGE MIXTURE "21" and FUNGCHEX. Both products are Calomel Sublimate Mixtures, used from Coast to Coast by leading Greenskeepers to control Brown Patch.

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in the Nest," scientifically developed by Rutger's University and licensed under a patent held by that University.

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To get complete information on CUREX use Quickmail Coupon No. 32; on WOOD RIDGE "21" and FUNGCHEX, use Coupon No. 31; on MAGIKIL, Coupon No. 33.

APRIL, 1938

Kroydon Hy-Power balls are put up in a counter display rack which holds 12 celluloid containers, each having 3 balls of graded compressions—Hy-Power H for extremely hard hitters, Hy-Power M for medium hard hitters, and Hy-Power R for



the lighter hitters who want maximum response from minimum impact.

Kroydon will also be glad to supply to pros four-color window streamers or banners, which feature the Hy-Power line of balls.

Jack Jolly, pres. Colonel Golf Balls, 872 Broadway, Newark, N. J., announces that Frank Nelson, well known salesman in the golf field, has taken over the Chicago territory for the company. Nelson's address is 7825 S. Wood St., Chicago, and telephone number is Triangle 1130.

Stumpp & Walter Co., 132-138 Church St., New York City, have recently issued their 1938 Golf Turf Supplement, "Essentials for Producing Good Turf," a comprehensive 32-page booklet that every person engaged in the growing of turf ought to have in his possession. The booklet gives a lot of informative statistics on turf propagation and care, and is interestingly illustrated. Copies will be sent free upon request to the company.

The L. A. Young Golf Company has taken on the representation of Merton hats and caps, making these available to the Professional through their nation-

THERE'S MORE FIGHT IN SPECIAL SEMESAN



Special Semesan gives you effective protection for your greens — without bulging your maintenance budget! Greater coverage — as much as 6,000 square feet per pound brings the cost as low as \$1.29 per green. Harmless to spray rig. May also be applied dry with compost. Special Semesan and the two original Du Bay brown patch fungicides — Regular Semesan and Nu-Green — are all stocked by your supply house. Send Quickmail Coupon 19 for free turf disease pamphlet.

BAYER-SEMESAN CO., INC., WILMINGTON, DEL.



It's the sensation among spreaders-this greatly advanced, and improved

ROOT PURPOSE SPREADER

with its many standard features including Locked Feed Set and "Finger Touch" Control. No "burn" at start or finish lines; better, smoother distribution due to superagitation. The perfect solution of spreader problems—write at once for details.

Also available with Metal Tires at lower cost.



GOLFDOM



A SWIMMING POOL

is quite as much of an asset to your Club as your Golf Course. In fact, if you don't have one, many of your members will be somewhere else on a hot day, because they prefer to swim, and you'll be "out" many shekels during the season.

A "GUNITE" Swimming Pool can be built in a few weeks and it won't cost very much. It will keep your wandering members "at home" and gather their uneasy dollars into your till. Take it from us-we know!

Right now is the time to start planning, for in a couple of weeks you can start building—We'll gladly give you the Lowdown. Write today asking to have our expert around to "talk it over."



wide organization.

The Merton hat is of white linen, with green under-brim and with air vents in the crown. It comes in the various size ranges and retails for \$1.75. The cap is

Air vents in crown help make Merton hats ideal for summer wear.



also of white linen with satin sweat band and air vent in the visor. Sizes have to be specified when ordering. The Merton cap retails for \$1.75.

Four new copyrighted golf score cards, including new forms for match and medal play, have been worked out by E. C. Conlin, Sales Manager, Golf Ball Department, United States Rubber Products, Inc., and are being offered free of charge to all golf professionals.

The new score cards, first to be developed during the present generation of golfers, provide several new scoring features.

The Medal Play Score Card has been simplified. The name of any member of a foursome can be located easily, and the player's net score determined quickly and accurately. The posting of hole by hole scores is made easier, with less possibility of error.

of error. The Match Play Score Card, made to accommodate 32 players, provides space for the competitor's qualifying score and for his handicap beside his name. There is also a space for the competitor's telephone number. This feature makes it easier for members of the match to arrange date and time. It also aids the tournament committee in keeping Match Play competition from dragging out for an indefinite period.

A Sweepstakes Score Card, not generally available, provides columns for the scores for the first 9 holes, the second 9 holes, for the gross score, handicap and net; and a column for the total number of putts taken during the entire round.

The Blind Bogey Score Card provides columns for the players' names, "out" scores, "in" scores, gross and net scores, handicaps, number of strokes under or over Blind Bogey, and the total number of putts for the entire round. At the top of the card there is a space in which to enter the Blind Bogey number that is drawn.

Prominent golf professionals who have seen these new U. S. Royal Score Cards are enthusiastic. They say that they are a big improvement over what they have

70