

October 1983	Published monthly by the Metropolitan Golf Course Superintendents Association			Vol. XIII, No. 9	
Date Change: Location: Host	Meeting Notice Thursday, November 17, 1983 Fairview Country Club	N STATE UNIVERSITY Grossing Septemb	hampionship Result ers Golf Club per 21, 1983	Results	
Superintendent:	Robert Alonzi				
Club Manager:	Drew Campbell	1st NEW JERSEY – GCSAN			
Telephones:	Diew cumpoen	Angelo Petraglia	76		
Supt.	203-531-8910	Matt Ceplo	82	323	
Clubhouse	203-531-6200	Terry Stanley	82		
Golf:	none	Harry Harsin	83		
Lunch:	12:00 noon. \$12.00	Vic Gerard	84		
Program:	Elections	Shaun Barry	94		
Reservations are a n			100		
		2nd PHILADELPHIA – PAC			
		Bob Bishop	82		
		Joe Felus	83	331	
TOT	he MGCSA Membership	Dave Kroll	83		
10.1		Dave Linde	83		
From: Mike Mat	fei, MGCSA Nominating Chairman	Mark Monahan	88		
		Harry Scott	97		
	g Chairman, I propose the following slate voted upon at the 1983 Annual Meeting.	3rd CONNECTICUT - CAG	CS		
the market of the second se		Peter Pierson	80		
President:	Chuck Martineau	Peter Bly	81	332	
Vice-President:	Peter Rappoccio Scott Niven	Frank Lamphier	84		
Secretary:	Sherwood Moore	Dave Roule	87		
Treasurer:		Barry Petrasko	88		
Directors (2 to be elected for 2 year terms):		Armand LeSage	91		
Pat Lucas					
Harry Nichol		4th METROPOLITAN – MGCSA			
Tim O'Neil		Chuck Fatum	80		
Larry Pakka	lla	Mark Millet	82	336	
		Scott Niven	84		
		Paul Veshi	90		
	Coming Events	Larry Pakkala	95		
November 1-3	New York State Turfgrass Association	John Carlone	100		
inoremoti i o	Conference & Trade Show, Rochester				
November 17	MGCSA Annual Meeting	5th HUDSON VALLEY - H	VGCSA		
December 10	MGCSA Christmas Party,	Jerry Kane	84		
	Ridgeway C.C.	Bruce Jensen	85	341	
February 28, 29-	53rd Mass Turfgrass Conf. &	Sam D'Auria	86	511	
March 1, 1984	Industrial Show	Ed Walsh	86		
March 1, 1904	Springfield Civic Center,	Jim Farrell	88		
	W. Springfield, MA	Fran Berdine	90		
	the springhous, the s	Tun Doronio	10		



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Publication deadline for *Tee to Green* is 21 days before the regular meeting.

6th POCONO - PTGA

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	Mark Graves	100	
	Pete Salinetti	108	
	Pete Lund	110	

Individual Winner - Angelo Petraglia 76

WELFARE: Please contact Craig Wistrand, 203-869-6477 (office) or 203-625-0319 (home) regarding any hospitalizations, etc. of members of the MGCSA.

Dear Chuck,

Just a note to express our appreciation of the thoughtfulness and genuine concern of the MGCSA during our period of sorrow.

Clare and I were always proud to be members of the organization and felt we had many friends in it, but never realized we would receive such affection.

Little Roger is doing fine. We baptized him the Sunday before Labor Day in Bethel. All his aunts, uncles, and cousins were there. They all came up to us to express their appreciation of the organization's generous gift.

> Many thanks, Roger F. Morhardt

For Sale

1971 International 3400 Backhoe Loader. Good condition, new tires. \$8,000 firm. Call 203-374-7976 after 7 p.m.

For Sale

1977 Toro 9-gang Park-Master with Perkins Diesel engine. Excellent condition. \$18,500.

also

Toro Verticutting Reel for Toro Vacuum – used only once. \$750.

Contact:

Steve Cadenelli C.C. of New Canaan 966-2145 (office) 966-0223 (home)

Guest Editorial

Well, now that most of the smoke has cleared and Jim McLoughlin's tenure as our National Executive Director is over, where do we, as association members, stand? I personally feel Jim was an asset to us. He made us take a more positive look at ourselves and made others, within the golf industry, take the golf course superintendent's position seriously. We needed what Jim was able to provide.

If Jim had a flaw, it was the pace he expected us to follow his lead. He was an over-achiever in a position that had been, for as long as I can remember, held by under-achievers. He is a progressive, conscientious, hard working individual who, given the right set of circumstances, can provide the leadership and direction necessary for a high standard goal-oriented organization.

I am not suggesting the GCSAA is not geared toward improvement, but that the pace must be slower, more thought out and possibly, better explained. We have, without a doubt, the best staff we ever had. Zahid, Jim, Chip, John, Mark, Chris, Diana, Ron, and all the other staff members are top quality people who, with proper direction, can provide our membership with the best in services. We must look at our present situation and location, evaluate it and develop goals that will meet our professional and possibly personal needs. I am hopeful our Executive Committee is thinking along these lines right now.

Jim McLoughlin brought a dignity to our profession that was missing. We should feel more professionally accepted because of his efforts and for that we all owe him a debt of thanks.

- Ed Walsh, The Greener Side

Superintendent Biography – Mark Millett – Old Oaks Country Club

by Dennis Petruzzelli

Assistant Superintentent of Brae Burn C.C.

The September meeting of the Metropolitan Golf Course Superintendents Association was held at Old Oaks Country Club in Purchase, New York. Presiding as Host Superintendent was Mark Millet.

Mark was born and raised in a small Massachusetts town named Turners Falls. As a youngster, he learned the game of golf and soon after grew fascinated with the ingredients required for the game including the care for the golf course. While in high school, Mark worked part-time locally at North Hampton Country Club (where he incidentally worked along side Chuck Martineau). At North Hampton, he received his first taste of golf course maintenance and decided on a career in turfgrass managment. Upon graduation from Stockbridge College, Mark moved to Westchester County and was employed by Fenway Golf Club in Scarsdale. He remained for five years, three of which as an assistant superintendent. Mark's next move was to Westchester Hills Country Club in White Plains as the superintendent and he remained there for six years. Old Oaks Country Club is his latest journey and he is currently in his second year.

Working outdoors in nature's backyard is what Mark finds most pleasurable about his job. Also worthwhile are the daily challenges that face him which makes each day interesting and diverse. The golf course superintendent is a person who wears numerous, different "hats." Of those "hats," one or two turn out to be the ones that fit best or tend to be "strong" points of interest. Mark believes that his fortè is personnel management/communications with crew members as well as club officials. Relaying plans to crew members, for example, must be simply explained and clear to achieve desired results. As for Club officials, communicating in most understandable terms as possible is imperative when changes on the golf course are to be made or to explain a necessary need for additional funds for future projects. The "hows" and "whys" supporting one's needs must be explained to help educate the club officials. These people are professionals of their field as well as we are and by explaining basics of turfgrass management, chances are good that you'll both produce favorable results.

Mark's maintenance programs are somewhat normal and similar to other superintendents. He has found great success by "sticking" to basics, which includes these cultural practices – aerification, verticutting greens, collars and approaches, topdressing greens lightly with a Lely spreader (which he originated), light feedings of nitrogen to favor bentgrass population and triplex mowing with baskets on fairway areas, to name a few.

An avid golfer and hunter describes Mark's interests when he can spare time from his busy job and family of wife Mary Pat and son Jeffrey. Congratulations are in order for the newest Millet member with arrival due in March. The Millets reside at Old Oaks Country Club in Purchase.



The Swilcan Bridge (of St. Andrews fame) is over 800 years old. For centuries it has withstood the trodding of townspeople and traders alike from harbor to town. Well before and after Columbus sailed for America, it has endured the crossings of St. Andrews' golfers. And, if your mind follows a logical bent, the Bridge must be one of golf's greatest contradictions, mysteries and miracles! How has this graceful granite arch held its ground against the onslaught of man, shoe and club all these years? It is a miracle.

One of the reasons for its endurance, at least for the first 750 years, may be that the Bridge never had to contend with the conventional spiked golf shoe! Allan Robertson, the world's first professional (1858) or even Old Tom Morris probably did not tread Swilcan in them. In fact, the earliest evidence so far of golf shoes with protrudences from the sole comes from an 1893 photograph of players in New Zealand's First Interprovincial Contest between Otago Golf Club, Dunedin, and a Christchurch team. Hobnail shoes are plainly seen on two of the golfers.

In this country, at the turn of the century, red rubber sole shoes were vogue, In his book, "The Walter Hagen Story", The Haig recalls his attire for the 1913 U.S. Open, including his wearing "red rubber sole shoes" at The Country Club. The following year he wore the same general getup except for the shoes. "I slid all over the course at Brookline in wet weather (in 1913)", he said and bought a pair of hobnail shoes for the 1914 Open. He won!

We know the Englishmen Harold H. Hilton won the U.S. Amateur Championship in 1911 in sneakers and that Gerome D. Travers also appears to be wearing sneakers in his 1907 victory.

But there is no doubt, the hobnail shoe was coming into its own. Bob Jones wore them at Merion in the 1916 Open and Jess W. Sweetser (1922 Amateur Champion) remembers "golf shoes with spikes" as standard foot gear by 1919. The trend was on and the boding not good for the growers of grass.

In the modern era, the spiked golf shoe has long been of interest to the Green Section. The first scientific studies were undertaken in 1958-59 by Dr. M. H. Ferguson to determine the effect on wear and putting qualities of different shoes on putting green turf. The conventional metal spike shoe, 'ripple sole' shoe and a modified golf shoe spike (with recessed or flattened spike shoulder) were tested.

The conventional golf shoe spike not only caused severe damage to the grass plant, but the rounded shoulder of the spike also caused significant soil compaction and delayed grass recovery for weeks beyond that of the other shoes. The ripple sole shoe soon dropped from the golfer's favor (and was banned by some clubs) because of the distortion it caused to the putting surface. The modified golf shoe spike, a by-product of the experiment, proved to be an important innovation. It was less damaging to soils and turf and is still manufactured today for golfers requiring spike shoes but still concerned with preserving putting green quality.

Course superintendents and green chairmen were also concerned. Charles Cogan, Green Chairman at Irvine Coast Country Club, California, undertook his own study of spike shoe damage to greens in 1960:

"The average golf shoe has 12 spikes; i.e. 24 spikes per golfer. I have found golfers take an average of 26 full steps (52

paces) per green. Therefore, each golfer leaves (26 x 24) 124 spike marks on each green. On 18 greens, he leaves 11,232 spike marks. If there are 200 rounds of golf played a day, there are 2,246,400 spike marks left behind. If this goes on for 30 days, you have 67,392,000 spike marks per month. And now, you wonder why you can't sink a putt?"

Both players and grass grower have a right to be concerned over golf shoes and what they are doing to the playing quality of our turf. But there is another, albeit less visible, factor that also deserves attention. There is increasing concern over the added costs in labor, aerifying, topdressing, mowing, weed control, cup changes, etc. brought about by spiked shoes. Some conservative estimates suggest a minimum of \$10 million a year; and that is in course conditioning alone. What of the additional costs in replacing pro shop and locker room carpeting, asphalt and concrete paths, door sills, wooden steps, benches, electric cart flooring and dashboards, tee markers, etc? Does the spike cost golf \$15 million or \$20 million a year? Whatever it is, there is no doubt of its destructiveness.

But who among us is crusader enough with courage to ask and optimism to expect today's golfer to readily give up wearing shoes with spikes? The golfer has been conditioned. He believes he needs the spike shoe and, no doubt, some golfers probably do. The power behind the 'big drive' in golf (250 or more yards), it is said, comes from the legs. Powerful legs need a secure grip. But not everyone who plays this game for the fun of it drives 250 or more yards! Not every golfer has that kind of leg power. Futhermore, not every round of golf is played under wet, slippery conditions. Fortunately there are increasing numbers of golfers today, including many club professionals, who enjoy the game and play it very well in shoes without spike or stud. Indeed, most golfers could easily play and enjoy the game, especially on dry days, in spikeless shoes. Hooray for them, for they shall lead the way to better putting turf at a lower cost.

The New Shoes

In 1982, a dramatic change in the design of golf shoes took place. New, multi-stud sole shoes were introduced into the United States. The studs are made of either rubber or a composition material. Advertising claims of "better traction" and "no damage to greens" were widely circulated. In one case, it was proclaimed the new shoes were "USGA approved;" a statement with no basis in fact.

As more and more of the "new shoes" came on the market, reports from golf course superintendents began to grow and that the new shoes were, contrary to the advertising claims, significantly damaging greens and adversely affecting putting surfaces, especially wet ones! Claims and counterclaims multiplied. The time was right for Green Section Golf Shoe Study II.

The New Study

Early in 1983, an experimental plan was developed at the University of California, Riverside, to evaluate the effect of four different type golf shoes on turfgrass quality and injury to putting green turf. The experiment and lessons from earlier shoe studies were incorporated in this plan. The new study got underway in May, 1983.

At Industry Hills, California, General Manager Bill Bryant offered the use of one of the Penncross bentgrass nursery greens for the experiment. The turf was nearly a year old and had developed approximately a ¹/₂-inch depth of thatch. It was mowed daily at 3/16-inch. The nursery green itself was built three years earlier to USGA Green Section Specifications. It received no other traffic than that imposed by the experiment plus normal maintenance procedures. Four types of shoes were used in the study:

1. The conventional metal spike golf shoe.

2. One of the popular, new multi-stud sole golf shoes.

3. A new "spikeless" golf shoe with very small suction-type cleats.

4. Another one of the new multi-stud sole shoes but with a different sole design than Number 2.

The overall experiment was designed for Three Phases:

Phase I was to evaluate the shoes under normal weather conditions. This phase would require six weeks of testing.

Phase II would immediately follow Phase I and be a subjective test of the putting qualities of each plot. Two golf professionals and one amateur golfer would, in a prescribed manner, individually putt and rate the plots.

Phase III was to evaluate, under extremely wet conditions, the four shoes as to wear injury effect over a period of three weeks.

Phase I

After a brief preliminary investigation, the study commenced on May 2 and continued through June 13, 1983. Each plot measured 4' \times 14' and was separated from adjacent plots by a 2' path. There were five randomized plots (one for each shoe type plus one check plot) in each replication and four replications used in this experiment.

Four people, wearing a different type golf shoe each day (in a predetermined order), walked and putted the plots designated for that particular shoe. They followed a prescribed walking and putting traffic pattern. Each completed pattern was considered to be one "treatment" and each plot received four treatments daily. The subjects, wearing a different shoe type each day (in the predetermined order), carried out the treatments for four days, took the fifth day off, and so continued throughout the sixweek span. Ratings were taken every two weeks using a scale of 1 equaling no visible damage to 10 equaling bare ground.

The Walkway Rating

Turf damage to the walkway areas was rated on May 26 and June 13. Since there was no visible damage to the walkways on May 10, no ratings were made.

On May 26, 24 days after beginning the experiment, Shoe #1 showed the most damage to the walkway area, Shoes #2 and #4 showed slight damage. Shoe #3 and the check plot had no visible damage.

On June 13, the turf damage on walkways was more severe. Again, damage from Shoe #1 was clearly more severe than the other shoes, followed by #2. Number 4 and #3 shoes were about alike in damage. All shoes gave statistically greater damage than the untreated check plot.

The Putting Area Ratings

Apparent damage to the putting plots increased throughout the duration of the study. Shoes #1, #2 and #4, in that order, gave the most damage. Shoe #3 caused some wear but considerably less than the other shoes. On the final day of these ratings, all shoe plots showed significantly more damage than the check plot.

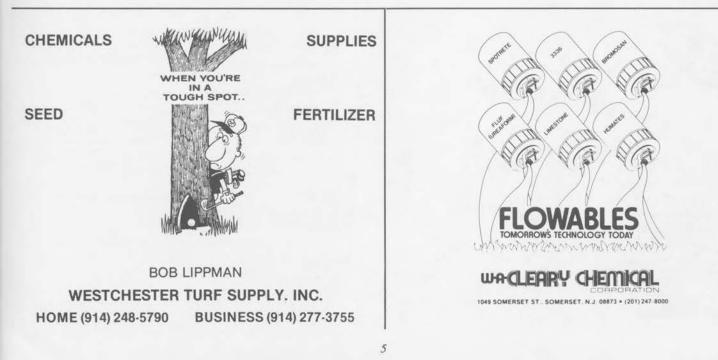
The Penncross creeping bentgrass had poorer color, decreased density and a scruffy, ragged appearance showing mechanical damage. These plots also had a noticeable surface depression and overall unevenness.

Phase II

Immediately at the conclusion of Phase I, the subjective determination of the putting qualities of each plot was made. Paul McGuire (PGA), Julie Lynd (LPGA) and Ross O'Fee (Amateur Golfer) cooperated in this experiment. They followed a putting pattern. Ratings were made from 1 (excellent putting qualities). to 10 (totally unsatisfactory putting qualities).

Putting ratings were made on the walkways as well as the putting areas of each plot. The only noticeable shoe influence however, was observed on the concentrated 'putting areas.'

These results show that, when putting across plots where Shoe #1 was worn, a decided poorer quality putting rating was



given by the golfer. On the plots of the other shoes, there was no noted statistical difference between them under the conditions of this experiment; i.e., normal weather.

Phase III

This study was to evaluate the effects of the four shoes on putting green turf under very wet conditions. Earlier reports, indicated that the multi-stud shoes caused considerable damage to wet putting surfaces. In some cases they have actually been banned from use on some golf courses in this country.

In Phase III, the individual plots measured $2' \times 10'$ and consisted of straight walkways over which 25 round trips were completed each day for three weeks. There were no putting areas in this test. All plots were replicated four times and again, the four people changed to a different type of shoe (in a predetermined order) each day and walked only those plots designated for that particular shoe.

Every day, just before walking began, the test area was heavily and thoroughly hand watered. The surface area was saturated until water was standing on it. It was allowed to drain and then the plot was again irrigated to saturation and standing water. Immediately following the second drainage, walking began. At the end of three weeks, the plots were rated on the same scale as before: i.e., 1 equals no damage and 10 equals bare ground.

The ratings showed that damage from Shoe $#1 \triangleright$ Shoe $#2 \triangleright$ Shoe $#4 \triangleright$ Shoe #3 with all showing more damage than the untreated check plots.

Discussion and Conclusion

From an overall view, the results obtained on turf damage and putting quality were due to the physical damage to the turfgrass plant and/or the surface disruption caused by the shoe soles. These results reconfirmed those of the Golf Shoe Study 25 years ago!

Shoe #1

This was the most damaging shoe tested. It also caused the longest lasting damage. In fact, four weeks after concluding the Phase I experiment, turfgrass damage was still apparent on all Shoe#1 plots. The length, shape and metallic nature of the spike as well as the limited number of metal spikes on each shoe

are factors that account for most of the observation of this study. The effect of compaction, caused in large part by the weightbearing shoulder of the metal spike as well as limited number of 'bearing surfaces' (i.e., 11 or 12 spikes per shoe) was pointed out in the 1958-59 studies. The contention that the metal spike helps (aerate) the upper soil surface is without actual basis.

Shoe #2 and #4

Shoes #2 and #4 were the second and third most damaging shoes in this study. The slightly less grass damage caused by these shoes seems attributable to their greater total surface contact area (i.e., more, wider studs or nubbins) on the shoe soles. The studs are shorter than metal spikes, more blunt and tend not to pierce the plant tissue.

Conversely however, these shoes under wet plus certain other conditions, have a marked tendency to ruffle or disrupt otherwise smooth putting surfaces and cause a 'waffle-like' imprint. Because the studs are blunt (and there are approximately 108 of them per shoe), they each cause a larger area of depression than the metal spike (11 or 12 per shoe) which slices through the surface and into the ground. How long the multi-stud imprint remains on the grass may depend on many factors including; the type of grass, how wet the surface, general drainage characteristics of the green, thatch density and depth, height of cut, rooting depth and soil types heavier than those encountered in this experiment.

Shoe #3

Shoe #3 was the least damaging of all to the turf and putting surface. Again, this seems attributable to the very high surface contact area, no great protruding spikes or studs and a non-metallic sole composition. The sole is comprised of approximately 750 small rubber cleats.

In summary:

Shoe #1

High Turf Damage

Metal spikes Long, pointed spikes Merchanical tearing, piercing Low surface contact area 11 or 12 spikes per shoe Spikes with shoulders





Destructive Turf Insects By DR. HARRY D. NIEMCZYK

A field guide and reference Over 130 color photos Easy-to-read language Life cycles, identification and diagnosis for northern and southern insects and mites Color photo guide for easy identification Principles of controlling pests in soil, thatch, leaves and stems

Equipment and methods for detecting turf insects 8 x 11, cerlox bound with heavy duty plastic cover

Send to: HDN BOOK SALES 2935 Smithville W. Rd. Wooster, Ohio 44691

Medium Turf Damage

Composition sole Shorter, blunt spikes Medium surface contact area Approximately 108 spikes per shoe

Low Turf Damage

Composition sole No spikes High surface contact area 750 small rubber cleats

Some Concluding Thoughts

The standard golf shoe spike, or any other shoe with nobs, studs, or protrudences of any kind, unquestionably cause greater damage to the grass and adversely affects putting qualities more than flat-type shoes. Golf is one of the few, and perhaps the only sport where the player's own equipment (spike shoes) directly, undeniably and significantly adversely affect the most critical playing surface of the game – the putting green. Even baseball and hockey smooth over their playing surfaces halfway through the contest! Golfers can't do that and, day after day, step after step, the spike golf shoes take their toll. Only ballet slippers might do more damage.

Is there a compromise? Is there some way out of this dilemma of self-destruction? In this technical age, lurking somewhere, there may be a new idea for golf shoes. Perhaps it is here or very near. Surely it is possible to develop a sole that will give good ground purchase and security without tearing the grass plant asunder.

Perhaps, instead of one pair of shoes for all seasons, golfers should have two pairs of shoes for two seasons; a spikeless shoe for normal weather conditions and a spike shoe for wet days. Oh! What a relief THAT would be! It would save our putting greens, our clubhouses and our maintenance budgets millions of dollars a year. And yes, it could well mean at least another 800 years for the Swilcan Bridge. That alone would make it worthwhile!

—William H. Bengeyfield, Nat. Dir., USGA Green Section Dr. Victor B. Youngner, Agron., Univ. of CA, Riverside Dr. Victor A. Gibeault, Ext. Horti., Univ of CA, Riverside



Lofts Presents Rutgers with \$27M Royalty



Lofts recently presented Rutgers University with one of the largest royalty checks New Jersey's state university has ever received. John Loft, Lofts President and Chairman of the Board, presented a check for \$26,764.02 to Dr. Lowell A. Douglas, Chairman of the Department of Soils and Crops.

The check represented a total of the royalties due on all seed from the 1982 harvest of: Mystic and Ram I Kentucky bluegrasses; Palmer, Diplomat, Yorktown, Yorktown II and Prelude perennial ryegrasses; as well as Rebel Tall Fescue. All these varieties were developed at Rutgers University.

Mr. Loft described the occasion as "another link in the continuing chain of turf developmental programs between Lofts and Rutgers." The royalties play a role in the development of . new varieties, because the money is used to sponsor further research and education.

At the ceremony, which took place on September 8, Dr. Douglas expressed his appreciation for Lofts' cooperation. "The development of new varieities becomes more meaningful," Dr. Douglas noted, "when a company like Lofts promotes



Shoe #2 & #4

Shoe #3

them. Because Lofts' involvement increases public awareness that new varieties are available."

Also present at the ceremony were Rutgers researchers Dr. C. Reed Funk, Dr. Ralph Engel, Dr. Henry Indyk and Dr. Robert Duell. In addition, Lofts was represented by Dr. Rich Hurley, Vice President and Director of Research and Agronomy.

The presentation was held at Rutgers Horticultural Farm II on Ryders Lane in New Brunswick.

A similar ceremony occurred in August at the University of Rhode Island. At the University's Field Day, Dr. Richard Skogley was presented with a Lofts check for \$14,000. This represented royalties for one year's crop of Jamestown Chewings Fescue.

For additional information, please contact Lofts, Inc., Bound Brook, NJ 08805. (201) 356-8700.

192-year-old Farmer's Almanac Predicts Normal Winter in the East, Mild in West

The Old Farmer's Almanac hits the newsstands this week for the 192nd year with predictions of a normal winter in the East, a mild winter in the West and a touch of nostalgia.

"It's tradition," says editor Judson Hale. "It always appears, it doesn't change and people realize that their grandfathers and great grandfathers and mothers read this.

"That yellow cover with the hole in the lefthand corner (to hang in the outhouse or pantry) is as good a sign of autumn as the changing of the leaves."

The 1984 almanac includes such tidbits as a recipe for Jack Dudley's woodpecker pudding — made for, not of, the birds advice on how to attract butterflies to a garden and 21 folk remedies for headache, one of which suggests leaning your head against a tree while someone drives a nail into the tree's opposite side.

It also has tide charts, "secrets of the zodiac," and tables that can tell you the best times to go fishing during each of the coming leap year's 366 days.

But what really sells the \$1.75 paperback's 4 million copies says Hale, are the legendary, if not 100 percent accurate, weather forecasts, written up to 15 months in advance.

This winter, the almanac predicts, weather east of the Rockies will be cold and wet or snowy at first, with a good chance of a white Christmas in the north. Then it will turn relatively mild and dry until late winter when colder weather will prevail. Total precipitation will be lighter than normal, but heavy snow in November, January and March will give the country's northern half a above-average snowfall.

Hale says Yankee Publishing Inc., of Dublin, spends about \$100,000 a year and uses "the latest scientific technology" to make the weather forecasts, based on cycles of solar activity, positions of the planets, and the moon's phases.

The predictions are checked against a 192-year-old secret formula.

Though Hale says the old formula is less specific than the modern almanac's 16 region forecasts, "it has never been in conflict with what we've come up with."

He maintains that the predictions are 80 percent accurate, but concedes that accuracy is a matter of opinion.

- Advocate, September 27, 1983

Warming Climate Will Alter Life On Earth

The federal government warned yesterday that a dramatic warming of the earth's climate because of the so-called "greenhouse effect" could begin in the 1990s, with potentially serious consequences for global food production, changes in rainfall and water availability and a probable rise in coastal waters.

An Environmental Protection Agency report said that levels of carbon dioxide in the air created by the burning if fossil fuels could result in an increase of 3.6-degrees Fahrenheit by the middle of the next century and a 9-degree rise by 2100, representing "an unprecedented rate of atmospheric warming."

"It's going to have a very profound impact on the way we live," said John Topping, staff director for the agency's office of air, noise and radiation. "Some of the effects will be beneficial; some will be detrimental. But our ability to accommodate them will depend much on our planning beforehand."

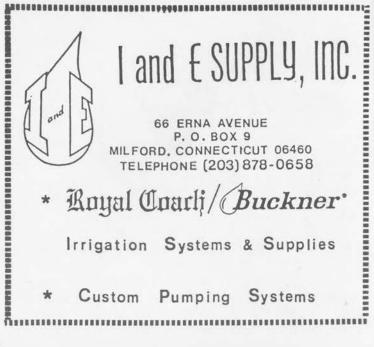
The agency called for a "sense of urgency" in dealing with the coming changes.

The condition is known as the "greenhouse effect" because carbon dioxide behaves like the glass in a greenhouse, permitting the sun's warming rays to reach the earth but not allowing the heat to escape. The effect, the report said, is like that of a "thermal blanket" around the globe.

"Temperature increases are likely to be accompanied by dramatic changes in precipitation and storm patterns and a rise in global average sea level," the study said. "As a result, agricultural conditions will be significantly altered, environmental and economic systems potentially disrupted, and political institutions stressed."

Stephen Seidel, one of the authors of the report, said that milder winters and much warmer summers by the 1990s may no longer be unusual.

"There are a great deal of natural fluctuations in the weather now," he said, "But most scientists think that by 1990 we will move outside the natural fluctuations of the weather and that these kinds of summers and winters will no longer be atypical, but will be, in fact, a new trend."



The report said that the warming trend will occur regardless of what steps are taken to reduce the burning of fossil fuels. Even a total ban on coal burning beginning in the year 2000 – which the report called "economically and politically infeasible" – would delay by only 15 years a 3.6-degree increase in average worldwide temperatures, the study said.

"Many parts of the world are likely to suffer from these changes, yet others are likely to benefit, "the report said.

The study said a warmer climate would raise the sea level by expanding the oceans and by melting ice and snow on land. An increase of only two feet, the report said, "could flood or cause storm damage to many of the major ports of the world, disrupt transportation networks, alter aquatic ecosystems, and cause major shifts in land development patterns."

"If you're building property beside the sea, for example, you might want to build it on slightly higher ground or be sure there is adequate seawall protection," Topping said, "It doesn't mean you can't live beside the sea. It just means you will have to make certain adjustments in living."

Changes in climate will also require shifts in agricultural practices, the study said. For example, it suggested that new strains of seeds be developed that can accommodate changes in the climate, such as decreased rainfall.

On the other hand, increases in carbon dioxide are likely to "enhance" photosynthesis and decrease moisture requirements for plant growth, "which should increase agricultural productivity," the report said.

A global warming, the report said, could also improve climate in upper latitudes, increase rainfall for some regions and reduce heating costs worldwide.

- Marlene Cimons, Los Angeles Times

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We're reminiscing under a waning sky, The hastening years that passed us by, Recalling our footprints in the sand, As we walked hand-in-hand, With your smile lighting mine, And your bantering humor, so incline(d); Those whispered words that told no lie, For lofty memories never die, Despite the years, swept by time; I'll hold your hand in mine; Until the last footprint vanishes with the tide.

- Frank Paladino

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Is there anything else you would like to read in *Tee to Green?* We look forward to hearing from you and would welcome your thoughts, problems, solutions, etc. — Pat Lucas



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