## THE "OFFICIAL" CALLAWAY HANDICAP SYSTEM

By LIONEL F. CALLAWAY, Golf Professional Post Office Box 1081, Pinehurst, North Carolina Copyright 1957 All rights reserved

Under the Callaway System a player's handicap is determined after each round by deducting from his gross score for 18 holes the scores of the worst individual holes during the first 16 holes. The table below shows the number of "worst hole" scores he may deduct and the adjustment to be made, based on his gross score. For instance, if his gross score for 18 holes is 96, he turns to the table and opposite that score finds that he may deduct the total for his three worst holes scored on Holes 1 through 16 inclusive. Thus, if he has one 9, one 8, and a 7, his handicap totals 24. From his total further plus or minus adjustment is then made according to the adjustment shown at the bottom of each column. For a gross score of 96 the adjustment requires a deduction of 2, resulting in a final handicap of 22. Thus 96 minus 22 handicap equals a net score of 74.

SCORE	CORE DEDUCT								
- hand -	-	70	71	72	scratch	<ul> <li>no adjustment</li> </ul>			
73	74	75	-	-	1/2	worst hole and adjustment			
76	77	78	79	80	1	worst hole and adjustment			
81	82	83	84	85	11/2	worst holes and adjustment			
86	87	88	89	90	2	worst holes and adjustment			
91	92	93	94	95	<b>2</b> <sup>1</sup> / <sub>2</sub>	worst holes and adjustment			
96	97	98	99	100	3	worst holes and adjustment			
101	102	103	104	105	31/2	worst holes and adjustment			
106	107	108	109	110	4	worst holes and adjustment			
111	112	113	114	115	41/2	worst holes and adjustment			
116	117	118	119	120	5	worst holes and adjustment			
121	122	123	124	125	51/2	worst holes and adjustment			
126	127	128	129	130	6	worst holes and adjustment			
						Maximum Handicap-50			

#### ADJUSTMENT

-2 -1 0

Add or Deduct to Handicap

- NOTES:
- S: 1. No hole may be scored at more than twice its par.
  - 2. Half strokes count as a whole.

+2

- 3. The 17th and 18th holes are never deducted.
- 4. In case of ties, lowest handicap takes preference.



#### **AUGUSTIN AND BURCH JOIN IFAS SOUTH FLORIDA**



Dr. Bruce J. Augustin has recently assumed the position of Assistant Professor at the University of Florida's Agricultural Research Center in Fort Lauderdale, Florida.

His efforts will focus on the water use of turfgrasses, with 70% extension and 30% research responsibilities. Extension activities will include the development and dissemination of information on turfgrass growth and management recommendations regarding water conservation and quality. Research activities will be directed towards evaluation of the quantity and quality of water required by turfgrasses and their relationship to management practices.

Dr. Augustin obtained a B.S. degree in Plant Science from the University of Delaware, a M.S. degree in Plant Science from the University of Idaho and a Ph.D. degree in Agronomy from the Ohio State University. He has worked on public and private golf courses in Delaware. While at the University of Idaho, he was a graduate research assistant in the turfgrass seed research program. At the Ohio State University he served as a graduate teaching associate for several crop courses, including turfgrass science.



Dr. Derek Burch was recently appointed to the position of Assistant Professor of Ornamental Horticulture at the University of Florida Agriculture Research Center in Fort Lauderdale. He joins an interdisciplinary group concerned with the production, protection and management of ornamental plants. As Extension Foliage Specialist he will have the responsibility of supporting the work of the County Extension agents with commercial growers in the southern half of the state. He will place particular emphasis on strengthening the flow of information to the growers and on ensuring that educational and research efforts are responsive to the needs of the industry.

Dr. Burch was born in Great Britain, and received his training in Agriculture and Botany at the University of Wales where he went on to complete a Masters degree in Plant Pathology. After working with a sugar company in the Dominican Republic, he came to Florida and held positions with Fairchild Tropical Garden and Fantastic Gardens in Miami before continuing graduate studies at the University of Florida. On the completion of his Ph.D. he was appointed Chief Horticulturist at the Missouri Botanical Garden in St. Louis, leaving there after four years to teach and to develop the botanical garden at the University of South Florida in Tampa. For the past five years Dr. Burch has been a consultant and owner/operator of a nursery and landscaping business in Puerto Rico.



## Finding Quality Personnel

#### By BOB HENDERSON Manager, Old Warson Country Club, St. Louis

All of us need to attract high quality personnel to our clubs and we need to motivate them to quality performance. The club industry is not alone with this problem; the entire hospitality field must deal with it if we want the best personnel. The future starts tomorrow; let's discuss how to attract and how to motivate.

Opportunity attracts. The industry offers a worker the chance to earn a living, at the very least, but this won't get or keep a quality employee.

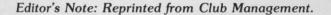
Attraction must equal opportunity for growth. For any employee showing traits of reliability, sobriety, conscientiousness, diplomacy with staff and members and a thorough knowledge of food and drink preparation and service, that opportunity exists. For advancement to management level, an employee needs only one last requirement: Knowledge about financial matters.

A bright employe will spot his opportunity for growth; training will motivate him to accept advancement when it comes. Systemized, good formal management methods, such as Management by Objectives (MBO), can work in a club as it works in small and large General Motors plants. It can help you find a staff trainer when you don't even have an assistant and it can help you keep a trained employee once he's through training. It even can show you how to promote staff to the top of their profession, such as the head housekeeper, sous chef, head waiter or maintenance man.

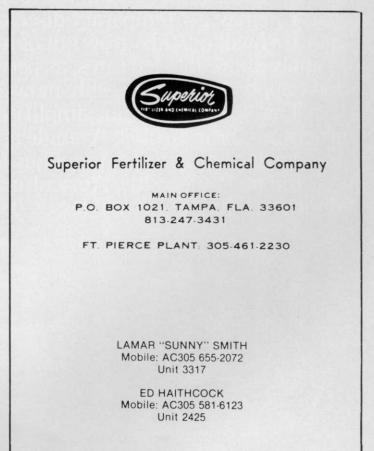
MBO requires that each department head train his back-up to take over the department should the need arise. MBO says each department head must train the people in his department to be able to train. Rosie, the department head riveter, for example, is no more talented as a professional trainer than a maitre d', but she trains her staff to rivet.

The manager is the trainer of the people who train, by insisting the department heads train, by attending training meetings and by developing reports essential to tracking training progress.

The problem of attracting high quality personnel and motivating them to quality performance belongs to the manager because it exists everyday in his club and it won't go away.







## OUR BIGGEST ADVANTAGE IS HOW LONG A SINGLE APPLICATION WILL CONTROL CRABGRASS, GOOSEGRASS, BULLGRASS AND SANDBUR.



That's right. You get an entire season's control with just one application of Asulox<sup>®</sup>. Control of your four major problem weeds in Tifway 419 Bermudagrass and St. Augustinegrass. Reliable, consistent control that will help produce the kind of turf that reflects most favorably on your management skill.

Asulox is easy to use without drift problems, since it is extremely selective to surrounding vegetation. You apply it postemergence to weeds with regular ground equipment. Use four to

ONE WHOLE SEASON.

Labeled for use in Florida only

five pints per acre in 30 to 50 gallons of water. Be sure to use the higher rate for goosegrass control. It's tough, but not as tough as Asulox.

You may get temporary discoloration following application. But your turf will quickly grow out of it, with no ill effects. Just be sure not to apply above labeled rates, as permanent turf injury may occur. And don't apply Asulox to freshly mowed turf or turf that's under stress.

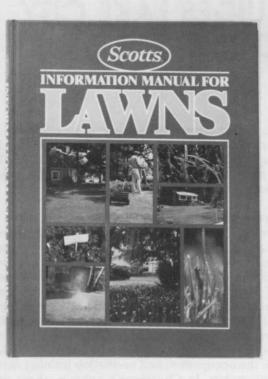
This season, why not simplify and improve your turf weed control program? Spray Asulox. A single application will control crabgrass, goosegrass, bullgrass and sandbur for one whole season.

Rhône-Poulenc Inc. Agricultural Division, Monmouth Junction, New Jersey 08852.





The once-a-season herbicide.

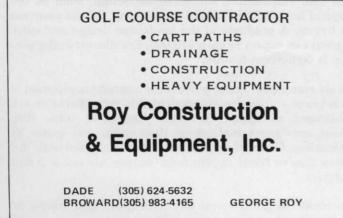


#### New Lawn Manual Published

Turf varieties, troublesome weeds, diseases, and insects are major topics covered in a new Information Manual for Lawns, just published by O.M. Scott & Sons, Marysville, Ohio.

The 96-page hard-cover book also discusses lawn planting, lawn managmement, and spreader usage, with key concepts highlighted in more than 140 color photographs and illustrations. Designed and written by Scotts lawn experts, the manual offers specific identification tips for lawn problems as well as general lawn advice.

The Information Manual for Lawns may be ordered directly from Bill Boyd, O.M. Scott & Sons, Marysville, Ohio 43040. Individual copies are \$7.95 each, including postage and handling.





## SLOAN APPOINTED VICE PRESIDENT

PLANTATION – C. Wayne Sloane has been appointed statewide vice president of community facilities at Gulfstream Land & Development Corp.

Jack Chambers, Gulfstream president, said Sloan will continue to serve as operations officer of Gulfstream's Jacaranda Country Club and Jacaranda West Country Club complexes, as well as Jacaranda nursery and landscape subsidiaries, and maintenance divisions.

Sloan holds a bachelor of science degree in agriculture from the University of Georgia and serves as president of the Florida Turf-Grass Association.

He joined Gulfstream in 1970 as director of golf courses, and was named an assistant vice president in 1976. Sloan and his wife reside in Fort Lauderdale.



## ADVISORY COMMITTEE GUIDES LAKE CITY GOLF COURSE OPERATIONS PROGRAM

The golf course operations program at Lake City Community College may be a small program at a small school in a small city, but its advisory committee members are scattered throughout Florida and Georgia, and its graduates find positions all over the United States. A small program with a large and interested following, one might say.

Jerry Cheesman, program director, may have trouble assembling his committee for twice-yearly meetings, but the results are worth it. Cheesman says the commttee's help in forecasting trends in the field is invaluable. "I'm isolated from this, and my advisory committee keeps me informed," he says. Besides keeping tabs on the field, the committee has input into course material, finds specialists to conduct seminars, and a few of the members even teach classes themselves. The committee members' areas of expertise range from landscape architecture, pest control, and agronomy, to selling turfgrass, running a nursery, and naturally, managing a golf course. This broad base gives the committee a "composite view," claims Cheesman.

By listening carefully to committee recommendations and maintaining communication with graduates of the program, most of whom enter what is generally regarded as a cliquish field, Cheesman can boast that in the last 11 year he hasn't had one student go without a job. "The pros are aware we exist," explains Cheesman. "They utilize our graduates in several lines of work." Working closely with the Golf Course Superintendents Association of America helps Cheesman to keep abreast of job openings. In addition, alumni frequently join the organization after establishing themselves, so a constant recycling process occurs. Cheesman has found that alumni are extremely helpful in finding internships for students.

Exactly what a golf course superintendent does on a daily basis Cheesman hesitates to define. He will volunteer, however, that it's a seven-day-a-week job that normally begins at 6:30 a.m. He points out that "when an irrigation line ruptures at 2:00 a.m. in the morning, it's the superintendent who has to go fix it." Typical daily duties include getting the crew to mow the greens, changing cups and tees, manicuring the greens, looking for damage and signs of vandalism, checking the irrigation system, renovating sandtraps, and many others. Cheesman is quick to warn that a person earns the \$12,000 s(he) makes the first year in the business.

Since turfgrass is the most intensively maintained agricultural crop, a golf course superintendent is responsible for a multimillion-dollar operation. An 18-hole course can mean the responsibility of \$250,000 worth of equipment, a crew that requires close supervision, and a budget of up to \$500,000. After five years, many superintendents make over \$30,000 per year.

Cheesman says it takes a certain sort of person to succeed in this work: "Someone who can get greasy fixing a clutch on a tractor at 1:30 p.m. and four hours later have a threepiece suit on and be ready to present a budget to a group of doctors and lawyers."

To prepare students for the multifaceted job, Lake City offers a three-year program. It includes instruction in a variety of areas: golf course mechanics, preventive maintenance, diesel mechanics, plant growth, grasses for golf and landscape, agricultural chemistry, landscape art, soils and fertilizers, accounting, materials calculation, management, golf course organization and administration, and a host of others. Highlights of the program are fall and spring tours of different types of golf courses, which allow students to learn firsthand from superintendents all that is involved in the occupation, and on-the-job training during a summer internship. In Cheesman's opinion, these experiences "make the program real."

Each year, 40 applicants are accepted in the program, although between 8 and 10 students leave after the first year. Usually, 25 students out of the original class complete the entire program. Two other programs are conducted alongside of golf course operations: golf course equipment mechanics and landscape design and sales. After the first year in golf course operations, a student can obtain a certificate in golf course equipment mechanics. This certificate allows the student to become a mechanic without further education. "This is the hottest market of all," says Cheesman, who claims that the need for trained mechanics in the area is great.

Landscape design and sales, a two-year program, provides instruction for 25 students per year. the program does not compete with the University of Florida's program in landscape architecture, a more conceptual program emphasizing the design of cities and towns. In fact advisory committee members for the Lake City program, many of whom are graduates of Florida's program cited the need for a program that emphasized smaller-scale design, such as the design of hospital and school landscapes. So the program was begun. A graduate of the landscape design and sales program can expect to earn \$10,000. Enrollment in the program is 50 percent female.

Female enrollment in the golf course operations program is much lower — one female student this year. Females are encouraged to apply, however. Cheesman adds that women are "more meticulous than men, and better at manicuring. All employers are extremely pleased with the women they've hired. In this field, women are not at a disadvantage."

Cheesman mentioned that one prestigious golf course in Pinellas County has a crew of 70 percent women, and if (Continued on Page 17)

# TURF & GARDEN, INC.





## **GROUNDSMASTER 52°**



This durable midsize rotary mows like a garden tractor, trims close like a walk mower and lets one man do both faster. Productivity — that's worth more.





Toro's engineering features make the Groundsmaster 52 more productive in many ways, and the durability for which Toro is famous keeps it that way longer.

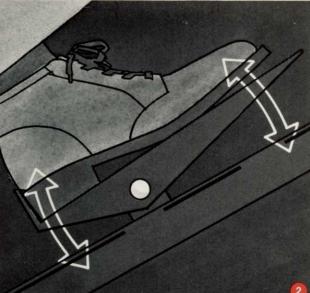
#### PRODUCTIVITY FEATURES

**Deck's out front and steering's in back** for superior maneuverability. The 52-inch deck is just the right size — big enough to get the job done quickly and small enough to get into those tight spots. A deck that's offset 10<sup>1</sup>/<sub>4</sub> inches is a Toro innovation that gives you one pass trimming around trees and obstacles. And its ideal along curbs and beneath overhanging shrubs, too!

- **Hydrostatic drive** provides single pedal operation for forward speeds, reverse. No lag, no jerk, no tearing up turf. It's almost instant, so there's no wasted time and effort. Your operators get superb speed control for all conditions 0-5 mph for mowing and up to  $8\frac{1}{2}$  mph for transporting.
- Cutting deck raises hydraulically for fast, easy transport over obstructions like curbing.
- **Excellent stability** comes from 4 wide stance wheels plus low center of gravity. Front wheels are drive wheels and are equipped with large traction tires. Both drive wheels have drum brakes controlled by individual pedals.
- **Operator station** features adjustable cushion seat and back, 15 inch steering wheel, hour meter and ammeter, all located for maximum comfort, convenience and efficiency. Optional deluxe suspension seat provides a smooth ride all day long.
- **Cutting height adjusts easily** from 1 to 4 inches without tools. Simply pull two pins and position spacers.

#### DURABILITY FEATURES

- Special Donaldson industrial-type air cleaner keeps your engine running longer by removing contaminants with a patented "dirt trap" design.
- **P.T.O. shaft** eliminates troublesome belts and makes simple the job of changing from one accessory to another.
- Heavy duty construction throughout means your Groundsmaster 52 can work harder, stay on the job longer.









The more it does, the more it's worth — here's how to make your Groundsmaster 52 do more.

5	Vacuum attachment picks up leaves, trash, thatch, paper and									
		needles, osable bag		them	into	12	bu.,	rear	mounted	

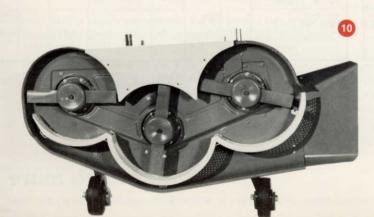
- **Cab and snowblower** converts machine for cleaning sidewalks, driveways in warmth, comfort, and safety. Blower lifts hydraulically. Discharge chute rotates 200°, is controlled from cab. Two-stage snowblower clears 48 inch swath.
- **48 inch V-plow** has front skids and reversible/replaceable blade for low cost snow removal.
- **48 inch rotary broom** sweeps parking areas, paths, walkways, saving the cost and time consumption of manual labor.

8

9

10 Heavy gauge steel leaf mulcher mounts under cutting deck, allowing blades to vacuum and pulverize fallen leaves.

Full Service Toro Distributor. When you need reliable maintenance and repair service, turn to your full service Toro distributor. He has highly trained personnel ready to serve you fast. A complete inventory of replacement parts. Plus other valuable services, like technical training for your operators. Whatever your needs in turf equipment, call your full service Toro distributor. He's one more reason why Toro commercial equipment is worth more.







## **GROUNDSMASTER 52° SPECIFICATIONS\***

					1946			1.1.1.1.1.			
PRIME MOVER (MODEL N	O. 30550, 30760)										
ENGINE		gs & Stratton, 1-cylinder, air-cooled. 16 HP @ 3600 RPM, 32.4 cu. in. displacement. Splash system. 4 pt. oil capacity, cast iron cylinder block, mechanical governor limits speed to 0 RPM, electric start.									
FUEL CAPACITY	6.0 gallons.			1.524							
TRACTION DRIVE		able (between 0-8.5 MPH) hydrostatic transmission mounted on GT20 Dana axle—20.9:1 . Single foot pedal control of ground speed and forward/reverse. 25 micron replaceable									
GROUND SPEED	0-8.5 MPH.								-		
TIRES/WHEELS/PRESSURE	< 6.00 2 ply rib. Two fr ms. Recommended tire	ont trac pressure	tion driv 10-15	ve tires psi dep	20 x 8.00 ending o	0-10 n mo	2 ply owing				
MAIN FRAME	All welded formed steel reinf	orced with square tubing.		-							
BRAKES	Individual 7" drum type w braking through traction driv	dual 7" drum type wheel brakes and parking brakes on front traction wheels. Dynamic									
STEERING	Automotive steering gear assembly. 15" steering wheel.										
CONTROLS	Hand operated throttle, chok	e, PTO, parking brake, an	d imple	ment lift.	261						
GAUGES	Hour meter, ammeter.			14							
SEAT	Low back molded foam sea deluxe suspension seat.				12 11	1 38 M					
ELECTRICAL FEATURES	12 volt, 66 plate, 61 amp-hour capacity battery. Dash-mounted ignition switch. 3.2 amp, 12 volt dual circuit alternator with 60-100 watt A.C. lighting circuit.										
WEIGHT	780 lbs. prime mover.						-				
IMPLEMENT DRIVE	1" diameter splined PTO sha		10000000000000000000000000000000000000								
CERTIFICATION	Certified to meet ANSI B71.	1a-1974 which is specifie	d in Feo	deral and	State O	SHA regu	lation	ns.			
CUTTING UNIT (MODEL NO. 30		DELUXE SUSPENS	SION SE	AT (307	66)						
Performance Acres/HR.) depending	e blade, front mounted rotary. n an 8 hour day @ 5 mph (2.25 on conditions. Deck offset 10%"										
to the left; 10" uncut c 1" to 4", adjustable i	rcle to the left. n ¼" increments in front. Four	Adjustments 6" total fore and aft, 2%" up and down, 3" suspension stroke.									
corresponding increment	its in the rear.	Capacity Adjustable for operators from 110 to 285 lbs.									
	5" deep Wind Tunnel® housing. box. "AA" section belt drive to										
Cutter Drive all spindles, 1" regrea	seable spindles with one double		lar et al	fearma	uprod	h nelver		forend	-		
Suspension Two 8" front wheels.	ngs. hick, heat treated steel blades. Suspended off the prime mover	Tubular steel frame covered with polyester reinforced Construction vinyl fabric. Special "low-temp" polycarbonate plastic side windows, tinted tempered safety glass windshield.									
at rear.		Electrical Flash	ing amb	er caution	n light o	on top, ru	bber	bladed			
Lift Two hydraulic cylinder: Weight 180 lbs. cutting deck.	5,	Features defroster fan, heavy duty electric windshield wiper.									
	B71.1a-1974, which is speci-	Weight 95 lbs.									
LEAF MULCHER (MODEL NO. 3		Accessories Light kit #30501 includes 2 35 watt lamps for fore and aft illumination, switches, wiring harnesses.									
staggered holes. Mounts V PLOW (MODEL NO. 30750)	ACCESSORIES Tire Chains - 15 lbs. Part No. 28-5470										
Construction reversible/replaceable sc Weight 160 lbs.	construction with front skid and traper blades.	and Wheel Weights - 80 lbs. Part No. 28-1270 Rear Weight Kit - 80 lbs. Part No. 24-5780 Standard Seat Model No. 30765									
V PLOW MOUNTING KIT (MODE	L NO. 30755)	IMPLEMENT AND	ACCES	SORY C	OMBIN	ATIONS					
Construction Consists of push arm a mounting V Plow. Weight 50 lbs.	attaching brackets. Required for		30545 Cutter	30515 Snow-		Sweepster Broom	Cab	30765 Standard	30766 Deluxe		
Accessories Tire chains included (Pa	rt No. 28-5470).			thrower		2.0011		Seat	Seat	-	
	justable side skids and discharge	PRIME MOVER Model No. 30550, 760	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.		
Weight 280 lbs.		LEAF MULCHER Model No. 30771	Opt.	-	-	-	-	-	-		
	t kits required (Part No. 24-5780).	MOUNTING KIT Model No. 30775	-		Req.	-	-	-	-		
48" width with 30° left		TIRE CHAINS	_	Opt.	Incl.	Opt.	1	-	_		
OVERALL DIMENSIONS AND W		Part No. 28-5470									
LENGTH WID TRACTION UNIT 74" 42	" 47" 780 lbs.	WHEEL WEIGHTS Part No. 28-1270	Opt.	Opt.	Opt.	Opt.	-		-		
W/DECK 95" 65 W/SNOWTHROWER 102" 50%		REAR WEIGHT KIT Part No. 24-5780	Opt.	Req.	Opt.	Opt.	Opt.	-	-		
W/V PLOW         99"         48           W/LEAF MULCHER         95"         65	" 47" 980 lbs.	HEATER Model No. 30878	÷ _	-	-	-	Opt.	-	-		
W/BROOM 118%" 52 W/CAB 74" 48	" 82" 830 lbs.	LIGHT KIT Model No. 30501	-	-	_	-	Opt.	-	-		
W/DEBRIS UNIT 123" 65	" 58" 1120 lbs.		1								
		Commercial P	roduc	ts Div	ision						

Commercial Products Division





## FIRMS TOLD WHAT TO DO WHEN UNION KNOCKS

**By JOE SUMMERS Business Writer** 

Editors Note: Reprinted from the Fort Lauderdale News.

Unions are coveting many South Florida industries' workforces, aided by a management attitide of "it can't happen to me."

That's the warning sounded by Dr. David J. Schwartz, chairman of the South Florida Manufacturers Association's Labor Relations Subcommittee, and Stephen Cabot, senior partner in a law firm that specializes in labor relations.

Schwartz and Cabot conducted a seminar recently for the SFMA on "What To Do When The Union Knocks." But, the two warn the industry that waits for the union to knock may have already waited too long.

"Our whole point is to make manufacturers aware of what they can do, legally and ethically to deal with laborrelations problems before the union knocks on the door," said Schwartz, president of The Management Consortium, a Fort Lauderdale consulting firm. Schwartz is quick to add that he's not anti-labor. He began his career as a union organizer.

"We can best illustrate the problem by taking the old real estate adage on the three words that make a successful builder: location, location, location," said Cabot, author of the book Labor Management Relations Act Manual: A Guide to Effective Labor Relations.

"Those three words for labor relations are: communication. communication, communication."

Schwartz and Cabot are in the business of representing the management side of labor relations, explaining how to avoid union and labor problems by improving management's relationship with employees.

South Florida is ripe for union organization, they say, because the unions are already strong in the populated Northeast, Midwest and West Coast industrial areas of the U.S. Florida's "right to work" law has lulled many employers into a false sense of security and the state's smaller companies are particularly ripe for unionization.

"If I were still a union organizer, I'd be in my car right now blanketing this area with union material,"said Schwartz.

The disadvantages of a union shop from management perspective are many, including loss of control of the business, the inability of being able to deal with employees on a oneto-one basis, and declining productivity and efficiency, the speakers said.

What should the employer do if he's committed to nonunion status?

"The best line of defense is getting their act together now, organize what they can do and say, before it's too late,' said Schwartz. "The biggest mistake management makes is that they don't listen. The problem is that most companies, their managers, don't know how to communicate."

Most employers, it seems, are unaware of worker unrest due to such factors as working conditions, compensation, benefits or even job security. And management is too often surprised that the first evidence of unrest is presentation of a demand to hold a union election.

"Management generally underestimates, takes employees for granted," said Cabot. "You can't talk above the level of the employee, because he won't understand what you're saying and he'll resent it. You can't talk below them either. You have to talk at them, to them and through them."

The open-door policy contributes to less communication in many instances, Cabot added. The employer who says his door is always open to hear complaints assumes everything is okay when he doesn't hear complaints. But a low-level worker isn't going into the boss's office to detail what bugs him.

"Instead of being satisfied that it hears no grievances, the management should find a way to encourage grievances," added Cabot. "The feeling for job security, and not being able to get it, is most commonly what makes the employee seek an outside organization for help."

Schwartz agrees. "Being willing to deal with employees is the key. The employees in most industries seek dependence. If he can get that dependence from his employer, then what does he need from a union to get dependence for him?"

The key, Cabot concluded, "is understanding yourself, understanding your employees and understanding who the adversary is.'

#### LAKE CITY

(Continued from Page 16) there were more women available, the owner would gladly hire more.

It would seem that such a program would have few if any problems. Not so, says Cheesman. He is highly concerned with reductions in vocational funding that may result in the elimination of small, high-cost programs, or worse, the expansion of the program without necessary staff and equipment. His question is one voiced by many: How do we maintain a high level of quality in an economic crunch?" It's a question that haunts many programs where small is beautiful.

#### **BY DR. IRWIN ROSS**

The human brain is one of the most wonderful things in the entire universe. Most of us think of it as a delicate mechanism, which it is; but it is also sturdy and durable, a far more useful tool than is generally realized.

Here are five important facts, some turned up by recent research, which can help you to use your brain more efficiently.

1. Is there such a thing as "brain fatigue?"

Laymen often speak of "mental fatigue," thinking that long, concentrated mental effort produces tiredness in the brain itself. Yet scientists believe that this state cannot exist. Your brain is not like your muscles. Its operations are not muscular but electro-chemical in character, comparable in part to a direct-current wetcell battery.

When your brain appears tired after hours of mental work, the fatigue is almost certainly located in other parts of the body, your eyes, or the muscles of your neck and back. The brain itself can go almost indefinitely.

What seems like mental fatigue is often merely boredom. In reading a difficult book, for example, you are torn between the desire to go on and the impulse to stop. It often is not fatigue that you feel but inattention and the inability to ignore distracting thoughts.

2. The brain's capacity is almost inexhaustible.

That part of your brain involved in thinking and memory, and all your conscious activites, has as its most important part 10 or 12 billion minute cells. Each of these has a set of tiny tendrils by means of which an electro-chemical message can pass from one cell to another. Thinking and memory are associated with the passage of these electrical currents. Quite possibly, people in general employ only 10 to 15 percent of their brains' capabilities.

How the brain stores its memories is still not fully known. Some scientists believe that each item of memory is contained in a loop of cells connected by tiny tendrils with an electrical current going around and around the loop, which might be hundreds or thousands of cells in length. Other theories suggest that the memory is somehow impressed, or *etched* on the cell, or exists on a chain of cells like knots in a string.

Be that as it may, the number of items that can be remembered is far greater than the total number of brain cells. After 70 years of activity, the brain may contain as many as 15 *trillion* separate bits of information. Thus your memory is a treasure house whose size and strength are almost beyond human comprehension.

3. Age need not prevent your learning.

One of the commonest misconceptions about the brain is that as you grow older something happens to it so that further attempts to study are difficult. This is true only to such a minute extent that for most of us it is of no practical importance.

You are born with all the brain cells you will ever have; a few of them die from time to time, and are not replaced. Except in the case of a serious brain disease, however, the number that die is negligible.

## Do you know your brain's unrealized powers?

It is true that all old people suffer impairment of their physical powers, and that some experience a decline of mental power. The best current medical opinion is that, in both cases, what happens is a series of minor "accidents" to various parts of our marvelously complicated physiological mechanism. None of these may be serious by itself, but the total effect can be severe.

Yet severe mental impairment occurs only in part of the elderly generation. Everyone knows of men and women who are vigorous and alert mentally into the ninth or even the tenth decade of life. Their existence proves that impaired mental powers are not an inevitable accompaniment of the passing years, but a result of disease processes.

Science knows of no reason why the average person cannot continue to learn with at least 85 to 90 percent efficiency through the seventh decade and beyond. It would be a fine thing if retired people went back to school or college or began to learn new skills and subjects. On the false notion that they are "too old to learn" millions of elderly people cut themselves off from exhilarating intellectual adventures.

#### 4. Your mental powers grow with use.

Like the muscular system of the body, the brain tends to atrophy with disuse, and to become better with exercise. This is proved by the fact that if the optic nerve is destroyed early in life, the brain cells in the corresponding visual area of the brain stay undeveloped.

As your brain matures, the nerve fibers are surrounded with a fatty substance called myelin, and they do not function properly until this has taken place. A newborn baby lacks most of its myelin, which is one reason why we cannot remember much that happened before we are two or three years old. Many physiologists believe that intensive exercise of any part of the brain encourages the growth of additional all-important myelin.

Anything you do with your brain exercises it, though obviously there is more exercise in doing something difficult than something easy. The more reasoning you do, the easier it is to go on to new reasoning. The ability to memorize also improves with practice.

Every aspect of your personality is stored in your brain. This includes your will power, which is also developed by practice. Each time you exert your will to drive yourself to the completion of an unpleasant or irksome task you make it a little easier next time to do what you need to do.

#### 5. The storehouse of the unconscious mind.

The most wonderful part of your mind is undoubtedly the unconscious, which lies below the recoverable memory and is thousands of times larger. We don't yet know very much about the unconscious mind, but we are learning fast and someday may know how to tap its great powers.

Your unconscious mind contains many millions of past experiences that, so far as your conscious mind knows, are lost forever. By means of several devices we now know how to bring back lost memories. One method is "free association," used by psychiatrists. If a patient lets his conscious mind wander at will, it can give him clues to forgotten things which, skillfully pursued by the doctor, will bring up whole networks of lost ideas and forgotten terrors. There are certain drugs which also help in this process; hypnotism, too, can be of tremendous value in exploring a patient's unconscious.

We can make more use of our unconscious minds. Innumerable people have found that they can profitably "talk to" their unconscious. Some people find that they can bid themselves to wake up at a certain time in the morning. You can sometimes even improve your tomorrow's mood if you will say to yourself when you go to bed —and believe it — that you will be more cheerful in the morning.

Editors Note: Reprinted from Sky, Delta Airlines Inflight Magazine.



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## WHAT'S INSIDE IT A BET

If you're hardnosed about business decisions, you want to get the in-depth facts on a product before you buy. That's why we've put together this head-to-head comparison between the insides of an E-Z-GO and a Cushman. We took comparable top-of-the line models, E-Z-GO's GT-7 and the Cushman Turf Truckster. Here's what we found.

Power Source: 18 horsepower OMC engine, tightly compartmentalized. Ground speed 0 to 22 mph.

Braking: Hydraulic internal expanding.

Payload: 1000 pounds.

Suspension System: Torsion bars, leaf springs, front and rear shocks.

Dump Construction: Single wall.

Headlights: Single.

Seating: Single seat for one passenger with back rest and hip restraint.

Price: Virtually the same.

