IEEE PROFESSIONAL COMMUNICATION SOCIETY NEWSLETTER

Vol. 22 January 1979 No. 1

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Baltimore Gas and Electric Co.
Baltimore, MD 21203

AdCom Meeting

The Annual Meeting of PC's AdCom was held on November 10, 1978 at IEEE Headquarters in New York City.

1. A unanimous vote was recorded to install the following PC members as members of the AdCom for the term 1979-81:

Ira Berman
Joe Chapline
Lou Cole
Irv Seideman
Della Whittaker
Bob Woelfle

2. AdCom vacancies were filled as follows:

Appointed	Incomplete Term	Replacing
Craig Harkins	1979-80	Bill Bulloch
Dan Rosich	1979-80	Jane Swanson
Dave Dobson	1979	Francis Leib
Bill Ternent	1979	Jim Lufkin

3. The following officers were elected for the year 1979:

Bert Pearlman President
Dan Rosich Vice-President

4. The following officers were appointed for the year 1979:

Craig Harkins Secretary
John Phillips Treasurer

5. President Patterson reported that the editorial staffs of both Spectrum and Proceedings of the IEEE have asked for survey and tutorial articles. "Communication Problems" was suggested as a topic. How about it, PC-ers?

6. PC now has more than 1600 members—an increase of about 300 in the last three years.

7. The Education Committee is considering the preparation of an audio cassette to enhance the home-study course "Technically--Write!" PC has been asked for ideas about video tape learning packages. Any offers of help PC-ers?

8. Student members of IEEE form an important audience for PC's educational activities. Will any PC-er offer to work with the Student Activities staff?

9. PC-ers who would like to help with or take charge of any project mentioned in this report should contact one of the officers identified on page 1.

10. PC's AdCom will meet next at 10 AM on Friday, Febuary 23, 1979, at IEEE Headequarters, 345 E. 47th Street, New York City. Friends of PC and PC members-at-large will be welcome.

PC AdCom at IEEE Hq.

Nov. 10 1978 in New York City

Tom Patterson gives Emily Schlesinger PC's Alfred N. Goldsmith Award for outstanding contributions to engineering communication. Gugliemo Marconi, in the background, looks over Tom's shoulder.

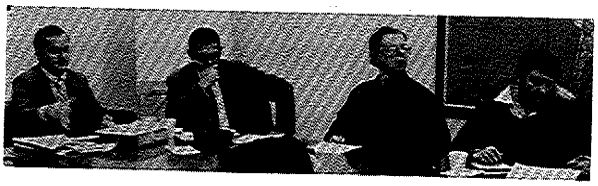
Gugliemo Marconi

Tom Patterson

Bert Pearlman

Emily Schlesinger

Ron Blicq

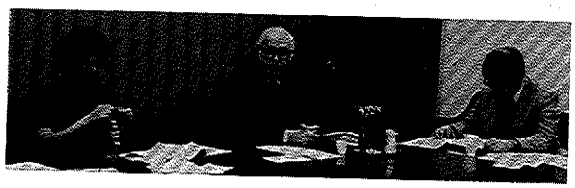


Rich Robinson

Pat McBride

Ron Eames

Craig Harkins



Della Whittaker

Joe Chapline

Dick Gowen

No photos of Dan Rosich because all photos by Dan Rosich.

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Award for Service

At the Annual Meeting of PC's AdCom on November 10, Emily Schlesinger was named recipient of the Alfred N. Goldsmith Award for 1978 in recognition of "outstanding contributions to engineering communication."

President Tom Patterson presented a handsome certificate and read a citation for "cheerful inspiration, leadership, and service within the Society's organization."

Emily joined PC in 1964, served two terms on AdCom, was president in 1976 and 1977, and has edited the Newsletter for two years. She has opened direct communication between AdCom and PC members in the US and abroad, promoted the work of the Education Committee, strengthened the organization of AdCom, and fostered cooperation between PC and other groups concerned with communication, particularly the Society for Technical Communication and the Council of Communication Societies.

Emily is employed at the Baltimore Gas and Electric Company where she has written, edited, and managed the production of company reports and procedural documents, and of engineering articles for trade and professional journals.

She holds the AB degree from Goucher College and the MA degree from Mt. Holyoke College, in physics; and the MA and PhD degrees from the University of Maryland, in English. She is a member of Phi Beta Kappa, a Senior Member of IEEE, and a Senior Member of the Society for Technical Communication.

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When you try to make an impression, that is the impression you make.

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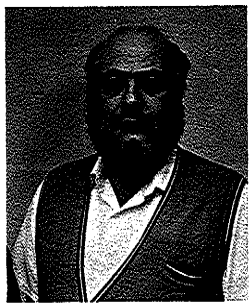
Berman Elected to AdCom



IRA M. BERMAN

Ira Berman, electrical engineer and professional communicator, recently became a Senior Editor of Power Engineering. For the past eight years he worked at General Electric Company's Knolls Atomic Power Laboratory (Schenectady, NY), but he has also been employed by Fairchild Camera and Instrument Company, General Electric Re-entry Systems, and the U.S. Naval Air Development Center.

Holding the BS (EE) and MS (EE) degrees, Ira was registered as a Professional Engineer (Pennsylvania) in 1962. He joined IEEE (i.e., AIEE) as a Student Member in 1948. For five years he was Associate Editor of the Electromagnetic Compatibility Group Newsletter, and for three years he was active in IEEE's Schenectady Section, serving on the Executive and other Committees and editing the Section Newsletter.

Ira has taught electrical and electronic subjects in schools and colleges, written military equipment manuals and equipment design guides, and served as chairman and newsletter editor for an American Mensa group. A skier, actor, photographer, and radio reader, he has been a PC-er since 1971 and was our Area Representative in Northeastern New York.

At the Annual Meeting on November 10, Ira was unanimously elected a member of PC's AdCom for the term 1979-81. His picture and biography should have appeared in the October issue of this Newsletter with those of the other five nominees.

Points of View

The following examples of angled attitudes, written by Robert French, are reprinted from the Newsletter of IEEE's Information Theory Group (September 1978):

I am conceptualizing.
You are daydreaming.
He is asleep.

Your unique combination of talents, unfortunately, does not fit within the range of skill-mix requirements currently available.
We have no openings at this time.
Don't call us, we'll call you.

Your suggestion is meritorious, and deserving of further attention; however current funding levels do not include any appropriations for this purpose.
We can't use your idea at this time.
Your idea stinks.

I make full use of compiler diagnostic facilities.
He lets the computer proof-read his programs.

My system is applicable to situations with unique parameters.
Your system doesn't work very well.
His system is a piece of junk.

We write proposals that present a thorough understanding of background materials.
You must have quite a library to refer to when writing proposals.
He writes his proposals at the Xerox machine.

My accountant employs the latest algorithmic accounting techniques with optimization of cash flow and maximization of profit.
Your accountant seems to do a few shaky things.
His accountant is a crook.

Welcome to PC!

The 59 new members of PC who joined us in October and November live in 8 countries and 20 of the United States. Welcome, all! We would enjoy having a communication from each of you--about PC, about communication, about your work or your ideas.

Arabia
A. H. Qureshi

Canada
R. H. Thom
E. E. MacEacheron

Columbia
G. Gonzales
J. E. Leal
G. A. Montana
J. Camacho

Costa Rica
L. G. Salas

England
M. A. Giddings

Italy
G. A. Rossi

Korea
D. M. Ahn

Nigeria
I. H. Idowu

United States

Alabama
F. I. Denny
K. O. Warren

Arizona
A. G. Herron, Jr.

California
V. C. Correa
L. M. Nirenberg
J. Weiss
H. S. Hansen
P. M. Warrington
D. S. Williams

Colorado
T. G. Booth
R. Galka

Connecticut
P. M. Glattstein

Florida
S. D. Weiss
W. Davis, Jr.

Georgia
J. D. Borst

Hawaii
A. M. Foster

Illinois
M. K. Bhatia
D. L. Wynen

Indiana
L. E. Mastin

Maryland
J. F. McPhail
J. E. Vrancik

Massachusetts
M. S. Blaha
G. T. Cromack
H. J. Thamhain
R. C. Rossignol
F. E. Donnelly, Jr.
R. Cassels

Minnesota
K. Slingsby
R. G. Schulze

New York
V. Gutierrez
G. L. Jones
G. Salton
P. J. McKenny
I. J. Kinal
W. K. Chew

Ohio
P. C. Marriott

Pennsylvania
N. J. Bialik
S. E. Morton
S. P. Saccone

South Carolina
G. J. Love

Texas
J. B. Gibson
J. P. Martin

Virginia
J. D. VonBergen
C. W. Bostian

Washington
A. A. Smith
G. C. Thompson
W. M. McIntyre

Area Representatives

PC-ers, if the spirit moves you to communicate, address your words or documents to any one (or more!) of the officers named on page 1 or the following Area Representatives (find names in telephone book or IEEE Directory):

K. Bramham - France and Holland
E. Giovanetti - Italy
E. O. Taylor - England
R. C. Winton - England

A. Ledbetter - Alabama and Louisiana
G. F. McClure - Florida
F. J. Reitmeyer - North and South Carolina
D. Rosich - New York City area
G. P. Roullard - Southern California
P. Welch - San Francisco area
W. R. Wilson - Southern California
R. M. Woelfle - Arizona, New Mexico, Oklahoma, and Texas

Education Commitee

PC's Education Committee made two "appearances" recently.

As part of the Joint Engineering Management Conference in Denver, October 16-18, and a complimentary service for the IEEE's Engineering Management Society, Ron Blicq conducted a half-day seminar, "Communication Guidelines for Managers."

Ron also chaired a program session, "Teaching Technical Writing/Communication to Engineers," at the Frontiers in Education Conference at Lake Buena Vista, Florida, October 23-25. The FIE Conference is a joint effort of the IEEE Education Society and the ASEE (American Society for Engineering Education).

As part of Ron's session, PC-er Dan Rosich presented a paper, "Continuing Communication Education and the IEEE Professional Communication Society,"

After the FIE Conference, on October 26 and 27, Ron and Dan conducted the two-day workshop, Technical Communication and Report Writing, which is sponsored by PC and IEEE's Educational Activities Board.

Credit

Fillers in this issue were found in and taken from the Newsletter of the IEEE Components, Hybrids, and Manufacturing Technology Society (June 1978).

Great opportunities come to those who make the most of small ones.

Home-Study in England

Professor E. O. Taylor, Chairman of the PC Chapter in IEEE's United Kingdom and Republic of Ireland Section, sends frequent word of Chapter activities. His latest communication tells of a talk given on November 9, 1978 at the Chapter meeting at Imperial College, London.

Professor J. J. Sparkes, Dean and Director of Studies of the Faculty of Technology at The Open University spoke on "Communication Problems at The Open University."

The Open University has about 60,000 students, each of whom studies individually at home; the problem of effective communication with these students, widely scattered throughout the country, is thus immense.

Basic instruction is provided by specially-prepared texts, radio and television programs, and, in appropriate cases, experimental kits; local centers are also available to which the students may travel to discuss assignments with their tutors, and a compulsory summer school of one week per year is organized for all students.

The major part of Professor Sparkes's talk dealt with developments in telephonic communication between students and between students and tutors. Conventional teleconferencing using the public telephone network is employed in a system like that used by the University of Wisconsin.

The Electronics and Communication Department of The Open University has developed an electronic device (a "black box") that can be linked to an ordinary television set and will be provided on loan to each student. This "black box" can be connected to a telephone line for teleconferencing, to a cassette recorder for presenting prepared audio-visual teaching packages, or to a light-pen whereby a drawing on the screen can be transmitted over the telephone circuit to provide a two-way audio-visual link with the tutor or with other students. Also, if a computer terminal is displayed on the screen, and the images of the keys are touched with the light-pen, access to a computer can be achieved.

Although developed for educational use, the methods of communication described can clearly be applied and adapted in many business and industrial situations.

In addition to writing this account of Professor Sparkes' talk, Professor Taylor notes that Chapter members were pleased to welcome to this meeting PC-er John F. Wilhelm of the U.S., IEEE's Director of Educational Services, who was visiting in England at the time.

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Hit or miss methods usually miss.

Failure is frequently the path of least persistence.

When the going gets tough, the tough get going.

Opinion on Home-Study Course

Ron Blicq, Education Chairman, presented a summary of student evaluations of PC's home-study course, "Technically--Write!" The comments, submitted in answer to a questionnaire, were generally favorable.

The majority of 25 persons who completed the course reported that it met their needs well, was structured conveniently, and was administered satisfactorily. About half, however, said that they would have liked more assignments--i.e., more practice--in all of the topics considered.

"Technically--Write!" features personal interaction with and individual attention from an experienced professional communicator. The course, which can be completed in about 3-1/2 months, provides supervised practice in writing business and technical reports, letters, resumés, and articles.

"Technically--Write!" is still available for $80 to IEEE members sending Membership Number, or $105 to non-IEEE members. Include $2 for handling and delivery. Send inquiry or check to IEEE Continuing Education, 445 Hoes Lane, Piscataway, NJ, 08854.

A PC Forum

Rudy Joenk, Editor of PC's Transactions, hopes to establish a feature called "Forum" as a vehicle for informal reader involvement.

He wants each installment of Forum to contain a letter to the editor or a short essay-like communication, accompanied by two or more responses solicited by the Editor and perhaps a reply from the original author.

Contributions should be suggestions or ideas for "brain-storming" rather than comments on published articles. Suitable subject matter is anything that may be of interest or value to communicators of technical information.

PC-ers, write a page or two on your pet peeve, a proposed "step forward," or thoughts about a controversial subject, and send your communication to R. J. Joenk, IBM Corporation, Boulder, CO, 80302.

Intercepted Letters

To PC-er Jim Lufkin from E. C. Sears of the Mid-continent Area Power Pool Coordination Center in Minneapolis:

"Your play, The Co-Authors, which you and your colleagues performed for us at the Minnesota Power Systems Conference, was very exciting and was very well received by the people here at the MAPP Coordination Center.... One person here even suggested that we perform the play for some of the committees for which we work. Please send us three copies.

"As I said when I met you in the hotel, I attended Mr. Ron Blicq's workshop on technical writing last November here in Minneapolis. Since then I have im-

proved my writing ability greatly and joined the Professional Communication Society of IEEE. I consider my decision to develop my writing ability a landmark decision in my engineering career. It has helped me immensely."

To PC President Tom Patterson from Jim Lufkin:

"I'd just like to tell you that I've had zillions of letters like this.... (But I haven't.)

Watch that Word

Definitions by David Diefendorf, publication unknown:

Jejune	the month after Memay and before Jejuly
Marionette	a very small bride
Decadent	someone having exactly 10 teeth
Savoir-faire	the art of having exact bus change
Diffident	not the same
Salmonella	rags-to-riches fairy tale about a young fisherwoman
Debark	what protect detree
Catacomb	grooming tool for cats
Rehabilitate	to habilitate once again
Indentured Servant	a houseboy with false teeth
Mandrake	a creature half man, half duck
Pusillanimous	scummy-looking
Restitution	a place where nervous people go to relax
Bushwhacker	one who is unkind to shrubs
Sycophant	an ailing pachyderm
Marigold	alimony
Sublime	a lime that is not up to par
Cyclomates	a gang of bikers
Stucco	past tense of "sticco"
Precursor	one who has not yet learned to swear
Sordid	arranged in neat piles
Lawsuit	what lawyers wear to work
Summersault	sault that will pour in humid weather
Palette	a small friend
Zoroastrian	one who bears the mark of Zoro
Shamrock	a fake diamond
Parcheesi	containing cheese and other ingredients
Omnipresent	an all-purpose gift
Propagate	a respectable entranceway
Raison D'Etre	a French breakfast cereal
Artifact	e.g., Matisse was born in 1869
Oxymoron	an especially stupid ox
Bombard	a poet who reads very badly
Kinesthesia	drug used to put relatives to sleep
Octopus	a cat with only eight lives

The man who makes every minute count becomes the man of the hour.

PES Project

A representative of the IEEE Power Engineering Society's new Public Affairs Department recently asked PC's AdCom for suggestions about ways and means of meeting one of the Department's objectives--namely, to establish communication links for the PE Society and its members with government and the public.

Specifically, a member of the Department's Public Affairs Committee inquired about the possibility of writing to interpret or explain, for "laymen," important engineering articles from the Transactions of PES and perhaps those of other IEEE Societies.

PC's AdCom agreed that such an opening of doors is greatly to be desired. We have tried to get short interdisciplinary, even transdisciplinary, articles for our Newsletter. But these are not toss-off-in-spare-time documents. In most cases, they must be researched, re-checked, and conferred about; and they cannot be written in a hurry.

PC's answer to PES, therefore, was both supportive and cautionary: Accurate interpretive articles should be written and PC can help find people to write them, but the project should be planned, funded, and controlled for quality.

PC-ers, employed or retired, let us know if you would like to hear more about this PES proposal.

Communications Society Magazine

Two technical articles in the September (1978) issue of the IEEE Communications Society Magazine concern engineering aspects of communication:

"NASA's Tracking and Data Relay Satellite System," by W. M. Holmes, Jr., tells about an $800 million set of four giant high-altitude relay satellites which will begin operation in 1980. These satellites in geostationary orbit 35,800 km above the earth, will receive data at rates as high as 300 Mbits/sec from lower-orbiting scientific and experimental satellites.

At present, the lower satellites store data on tape recorders and "dump" at high speed when in view of a NASA Network Station on the earth. With the new System, they will send data up to the Relay Satellites instead of down to many earth stations, and they will be able to undertake missions that generate volumes of data beyond the capacities of present tape recorders. The high Relay Satellites will transmit data to a single earth station, at White Sands (New Mexico), and stations which now receive data from low- and medium-altitude orbits will be closed.

Each of the Relay Satellites weighs more than 1000 kg (nearly 2-1/2 tons) and is over 17 m (57 ft) long. They look like fantastic insects with rectangular head and tail (solar panels) and circular wings connected by thin rods to several miscellaneous body parts.

The 4-satellite Tracking and Data Relay Satellite System is called, not surprisingly, TDRSS; each individual Relay Satellite is a TDRS. The System will be owned and operated by Western Union Space Communications, Inc., but shared by Western Union's satellite

communications system and NASA's tracking and relay functions.

One TDRS will be an on-orbit spare, one will serve Western Union's communication system in the U.S., and the other two, TDRS East and TDRS West, will be leased by Western Union to NASA.

* * * * * * * *

"Spread Spectrum," by W. F. Utlant, describes techniques for sharing the radio spectrum. Traditionally, bands of particular frequencies in the spectrum have been assigned to particular users, but such frequency division is inefficient for many kinds of service and the spectrum is becoming overcrowded.

One possibility of alleviating some of the demands for spectrum use is to move to higher frequencies, but these require different kinds of system performance, techniques, and equipment. Another method--the one most generally adopted today--is to reduce allotted frequency bandwidths, but this tends to reduce the quality of system performance and require more costly equipment.

A third method uses still evolving techniques of "spread spectrum." These techniques, instead of reducing frequency bandwidth, use a coded, modulated signal, other than the information being sent, to broadband (i.e., spread) the transmitted signal.

Spread-spectrum systems produce low interference for other systems, have high capability for rejecting interference, and allow multiple access. They permit transmission of messages under difficult conditions of low signal-to-noise ratio, low signal levels, and low message detectability.

They could be used in either of two ways to increase the efficiency of sharing and using the radio spectrum: overlay widebank spread-spectrum usage in selected frequency bands now assigned to several narrowband users, so that both kinds of user would use the same frequencies at the same time; or establish certain bands for spread-spectrum systems and assign codes rather than frequencies.

* * * * * * * *

A third technical article in the same issue deals with mathematics rather than engineering--in "Gentle Diversions," F. S. Hill, Jr. discusses the quantity phi:

Divide a line segment into two parts, with lengths A and B such that the length of the whole segment, A + B, is to the larger part A as A is to the smaller part B:

$$(A + B)/A = A/B. \qquad (1)$$

The term A/B, called the "golden ratio," is also written as ϕ, in which case equation (1) becomes

$$1 + 1/\phi = 1 \quad \text{or} \quad \phi^2 = \phi + 1. \qquad (2)$$

The positive root can be calculated to as many decimal figures as desired:

$$\phi = \frac{1 + \sqrt{5}}{2} = 1.6180339$$

Equation (2) shows that $\phi - 1 = 1/\phi$, as Hill points out, and he demonstrates algebraic and geometrical characteristics of ϕ, including the straight-edge-and-compass construction of an arc of length ϕ and the use of ϕ in "golden" rectangles, triangles, and ellipses, and in the logarithmic spiral.

Hill includes diagrams and puzzles, discusses "uses" of ϕ, and lists eleven references; one of the latter, The Divine Proportion, by H. E. Huntley (New York: Dover, 1970) is concerned exclusively with ϕ and golden relationships.

Microprocessor Software

IEEE's Educational Services Department offers a home-study course on "Understanding Microprocessors through Software Design." It is designed to give subscribers a user-level knowledge of microprocessor chips and their applications.

The two five-section units of the course deal respectively with basic software concepts and with computations, interfacing, and advanced functions. Students send answered review questions and completed exercises for comment by members of The MGI Management Institute (Larchmont, NY).

The course may be examined by 15 days with no payment. It costs $125 U.S., complete, in the U.S. and Canada; $85 U.S. for Unit One only. Prices are increased by $15 U.S. per unit to cover air-mailing to other countries. For a 15-day free trial, send your name and address to IEEE Educational Services ES-1, 445 Hoes Lane, Piscataway, NJ, 08854.

Social Implications of Technology

The first Award by the IEEE's Committee on Social Implications of Technology for "Outstanding Service in the Public Interest" was presented to three employees of the San Francisco Bay Area Rapid Transit at WESCON. The three engineers, Holger Hjortsvang, Robert Bruder and Max Blankenzee, suffered considerable personal loss in their efforts to bring attention to unprofessional engineering practices in the design of the BART system. The cash award with the CSIT certificate was supplied by an anonymous IEEE member. As a result of this case, the IEEE has established a procedure for supporting engineers whose jobs could be in jeopardy for upholding the Institute's code of ethics for the protection of the public.

SSP

The Society for Scholarly Publishing will meet June 4-5, 19 9 in Boston. This organization has developed from the Conferences on Scientific Journals sponsored by IEEE and PC in 1973, 1975, and 1977.

SSP has two classes of membership, individual ($20 U.S. per year) and organizational ($100 U.S. per year). In both classes are international representatives of the humanities and related arts as well as of the sciences and related technologies.

For further information, write to Suite LL, 1909 K Street, N.W., Washington, DC, 20006.

26th ITCC

The 26th International Technical Communication Conference, sponsored by the Society for Technical Communication, will be held May 16-19, 1979, at the Marriott Hotel in Los Angeles.

The theme of the Conference is "Technical Communication--Shaping the World We Live In," and submittals have been grouped in four stems or categories:

Education and Research
Visuals and Audiovisuals
Management and Development
Writing and Editing

Although the STC is an organization of writers, PC engineers find many helpful, useful ideas at its Conferences and in its Proceedings. More detailed information about the 1979 program will appear in the next issue of this Newsletter, as encouragement for Californian PC-ers to attend the Conference and as suggestion for all PC-ers to consider purchasing the Proceedings.

PC will sponsor two workshops at the 26th ITCC --one given by Ron Blicq and Dan Rosich on how to teach technical writing and one given by Dr. Lee Gershuny and Dan Rosich on "Values and Bias in Linguistics."

Get more information from STC, 1010 Vermont Avenue, N.W., Washington, DC, 20005, or 26th ITCC, 10730 Seven Hills Drive, Tujunga, CA, 91042.

Professionalism by E.W. Herold

It is my thesis that if an engineer acts like a professional, he or she is apt to be treated as one. The present text suggests a few steps which help to distinguish technical professionals.

PERFORMANCE

The engineer employed by a large company, if he begins to lose his identity as an individual professional, also begins to lose the prestige which adds to his self-esteem. What should his behavior be to prevent this? There are many answers.

Foremost, the engineer must perform outstandingly at his job. If he is inventive, he surpasses others in writing down and promoting his ideas. If he is highly analytical, he uses this skill in evaluating ideas of others. The tenacious engineer persists when others are discouraged, and the impatient engineer takes advantage of this converse quality to move fast in trying many, many potential solutions in a short time. The person who is less brilliant or inventive simply works harder on the ideas of others, so that his performance remains outstanding.

The one sure way to build up self-esteem is success as proven by performance. All other professional characteristics support, and are supported by, outstanding job performance. Three such characteristics are:

1. The need for continuing education in new fields and other disciplines has been stressed so often that it needs no amplification.

2. The engineer should communicate often and freely with his peers. Within his organization, he finds individuals with all the special qualities needed for outstanding group performance. By using their help, and by helping them, he enhances his individual prestige as well as that of his company. Outside his organization, the engineer should publish his work, attend technical meetings in his field, and make personal contacts with as many as possible in environments other than his own.

3. The engineer should support his profession by joining and participating in his own professional society as well as in those of related disciplines. Far too many engineering employees of large corporations view the professional society as a journal subscription service, instead of as the representative body of his profession. The result is that the society loses its representative status, but the engineer loses even more: an important distinction between himself and the nonprofessional.

This list is by no means all-inclusive. The present discussion will be limited to an expansion of items 2 and 3.

PUBLISHING

First, let's consider the publication of one's own work. Free publication of results helps many others, because it expands knowledge, saves time, and minimizes duplication of effort. But such considerations are not the most important reasons. For every result which an individual publishes, there are thousands of results published by others for him to use. He is part of a vast system, in which he contributes a little and is given, in return, access to a tremendous quantity of knowledge contributed by other professionals. There aren't many instances in life in which the return on investment is so high. However, this return will not happen if individuals, collectively, do not make their small donation.

In the case of research and development, of course, there is an additional reason for writing up one's work, and that is that otherwise there's not much point to doing the work at all. In R&D, there isn't any product if there isn't any record; one of the key products of research and development is paper with information on it. This situation is so well understood that technical publications are replete with R&D papers.

But not all is communicated. There are the lazy fellows who just never find the time to do the writing. Then there are the overly industrious engineers who are so busy on the next project that data on the former ones remain in crude original notes, never again to be interpretable by anyone but the originator. Finally, there are the deadbeats who are going to beat the game by using everyone else's published work, but who purposely withhold their own. All three types defeat the system, lose prestige and self-esteem, and rarely end up among the more successful R&D workers.

For professionals who are not in research or development, such as the manufacturing engineer, the quality expert, the sales engineer, and many others, the question of communication and publication is equally important. Unfortunately, one does not find in these areas as many prestigious outlets for publi-

cation or presentation, nor has there been as great a system built up whereby the "return on investment" is measured in high powers of ten. This state of affairs is entirely the result of so little input to the system. If all the non-R&D engineers communicated as freely and widely as do the R&D workers, the return would build up quickly.

I have often been dismayed to find the great reservoir of professional knowledge and talent within a large company that lies hidden and unknown except in the immediate environment of the individual possessing it. Small wonder that, with such disregard of the professional's obligation to help others, many engineers are viewed as just another bunch of employees.

PRESENTATIONS

So far, I've talked of publication, but this is only one form of communication. It's an especially useful form because it permits archival storage, and to the reader it allows detailed personal study and repetition. Every sentence can be read and reread, a page can be returned to and re-studied, and every figure and diagram is available for later use.

But there's another way to communicate which is remarkably effective, the oral presentation. In my own experience, I have often been surprised, after hearing a talk on a subject I had already seen in written form, to suddenly find I could see something significant that had eluded me. The reason is, of course, that the speaker requires the listener to follow linearly a train of thought. The listener can't stop and reflect, or jump to some other part of the material, or go back to repeat.

The good speaker, who knows exactly the message he wants to convey, moves the listener along the track directly to the conclusion. Far too many engineers fail to see this distinction. They fail also to use the technique to advantage for themselves; more commonly, they fail to go to meetings and talks, on the ground that they can read about the subject. The two media are not equivalents and again, the engineer possibly has failed to utilize fully the means at his disposal to enhance his performance and that of his profession.

THE PROFESSIONAL SOCIETY

What of the professional society and the role it plays? Clearly, one of the chief functions is to provide publication media and forums for oral presentation. But success in these two endeavors requires more than the dedication of small bands of volunteer editors, program chairmen, and committee members. The society must be supported actively by the professionals it is intended to serve. The engineer has many temptations to freeload on his obligation. His company library provides journals, and his employer often permits expense account travel to meetings, so that a higher registration fee for nonmembers is not inducement to join.

No professional society, however, can survive on library subscriptions and registration fees and remain a fraternity of professionals who organize to help themselves. Failure to belong to your professional society (often, to several different societies) is like failing to feed yourself properly: you starve the very source of your welfare, and reduce the "return on investment" mentioned above, which is potentially many powers of ten.

Most professional societies do much more for the profession they serve than act as a communication medium. They become official spokesmen for the profession in local, national, and international affairs. The successful society serves its members by dissemination of general news, by surveys of membership views and of the status of the profession in society, and by setting up engineering standards of measurement and definitions of terminology. By establishing criteria for various levels of performance, including a hierarchy of membership grades, they maintain the professional standards without which professionalism has no meaning. The membership directory of the society is a valuable source book for personal communication and solicitation of help. In most societies, an award system provides incentives to perform over and beyond the normal rewards provided by other parts of society and by one's own self-esteen. Again, none of these factors can be highly successful unless the qualified professionals are members.

The society appropriate for [many] engineers is, of course, the IEEE. Yet, in my own experience, this largest engineering society in the world has never been supported by the profession to the extent one might expect. Perhaps as many as half of the professionals whose livelihood depends on the electrical and electronic sciences are not members at all, and, if members themselves, many fail to use the advantages of membership to the extent they could. I hear criticisn of the organization, its aims, and its polocies; but much of the IEEE's problems can only be ascribed to apathy and lack of ambition on the part of the members.

There has probably never been a year in which there wasn't some Institute policy that needed change or improvement. Yet, in integrating everything that IRE, AIEE, and IEEE have done over the years, the positive so far outweighs the negative that I cannot conceive what engineering careers would be like without the Institute.

Furthermore, I have not seen many instances in which the nonmember has contributed much to improve the Institute. Thus I have always resented the engineer who fails to join or renew his membership on the ground that the IEEE should be better. Of course it should, but the way to make it better is to support it, first with membership and second by participating actively in all the functions in which the Institute can or should serve him. To be practical about it, we can't make a better investment.

CONCLUSION

There are many ways in which engineers can be professional. Communicating through publications and presentations and being actively involved in professional groups are but two. I would like to challenge you to take stock of your activities. What are the various ways in which you act as a professional? If my thesis is correct, that you will be regarded and treated as a professional only to the extent that you demonstrate your professional credentials, then the means to a professional goal are at your disposal.

--Adapted by permission of Dr. Herold.

Great minds discuss ideas, average minds discuss events, small minds discuss people.

"Reading Problems"

Adapted from The Underground Grammarian (November 1978):

The public schools often teach reading in such a way as to insure continued employment for the swarms of reading specialists, diagnosticians, and therapists who conned them into teaching it that way. If it weren't for the "professionals" of reading, most children would learn how to read almost as easily as they learn how to talk. If your child has been in school for years but still can't read worth a damn, be skeptical when the school people start talking about a "reading problem." [Many of them] would breathe easier if they could only persuade us that the failures of the schools are due to all those "problem youngsters" and their "learning disabilities." Remember that the "reading problems" of many students have mysteriously disappeared after less than a year of traditional teaching.

If you have disquieting suspicions about the way your child is being taught to read, or if you'd rather teach him yourself, you should write for counsel and comfort to the Reading Reform Foundation, 7054 E. Indian School Road, Scottsdale, Arizona 85251. At the RRF, you will find concerned and informed people who do not make livings by convincing you that they are experts.

Handicapped Managers ?

Communi-Vu, Inc., of New York City, volunteers its time, experience, and facilities on Monday mornings to train physically handicapped people for management positions. Training consists of teaching them to improve communication effectiveness in interpersonal situations, small group meetings, and formal presentations. There is no charge for this training. For more information, call or write to Roslyn Bremer, president of Communi-Vu, 58 W. 58th Street, New York, NY 10019 (212-PL9-7343).

Information for Employees

An item in the Industrial Communication Council's Newsletter for November 1978 says that pamphlets are the most favored form for distributing information to employees. Of company representatives surveyed by the University of Southern California Center for the Study of Private Enterprise, 88 percent preferred pamphlets.

Among other media suggested, in order of judged appropriateness, are posters, film and slide presentations, payroll stuffers, and closed circuit television.

Of the nearly 500 respondents, 89 percent, however, said that they would like to receive newsletters. Only one quarter of the companies represented have employee information programs, but another quarter are planning to establish them.

Adjusting

Karen Furuhjeim of Vanda, Finland, writes in the Newsletter of IEEE Women Engineering Students (Fall 1978) about on-the-job attitudes:

[There are many] differences between ideal and actual.... In the ideal world, people are friendly; intelligent people are open-minded and even more friendly; men are gentlemen and women are ladies.

In the actual world, there is nothing of the sort. People are tired, bored, frustrated, malicious, overworked, narrow-minded, lazy, or generally too wrapped up in themselves to know or care about what is happening to other people.

There is no guarantee that you will like your job. There is no guarantee that you will like your co-workers, or that they will like you. There is no guarantee that you like your family or your neighbors, either, but most successful people don't let that stop them. They try to be friendly, or at least polite. They work together, talk together, joke, ask questions, clear up misunderstandings.

It takes a tremendous amount of courage, some days, to face people, to make a first, second, third gesture, to be willing to suspend judgement, and to give people the benefit of the doubt. But without this courage to try and try again, you will give up, and it will be a very unfriendly world.

Digital Time

The regular feature, "Final Tribute," in New Times magazine was called "Hello Mr. Chips" in the issue of July 10, 1978. Author Craig Buck began with a brief history of integrated circuits.

"In 1958, researcher Jack Kilby of Texas Instruments invented a chip of silicon, about the size of an infant's fingernail, upon which the equivalent of 15,000 transistors and diodes could be systematically arranged like so many angels on the head of a pin. Everyone in the electronics industry immediately caught new-product fever and chips flew fast and far.

"Then, late in 1971, the Royal Typewriter Company advertised the first hand-held digital calculator, the primitive Digital III. Another race was on, and as products became more sophisticated, prices dropped from around $200 to around $10.

"In the electronics industry, silicon chips were gambling stakes; rapid technological changes and reductions in manufacturing costs led to chaotic marketing, to overpricing, to obsolescence, and, for many companies, to financial ruin.

"But," Buck's article continues, "shed no liquid-crystal tears for the digital electronics industry. Save them for the slide rule industry--may it rest in peace.

"There was a time when an engineer, chemist, mathematician or physicist felt naked without his elegant, mahogany, precision K&E (Keuffel & Esser, once the Rolls-Royce of slide rules). But university stores no longer stock slide rules, schools no longer teach their use,

professionals no longer refer to them, and K&E no longer makes them. Nor does K&E's former competitor, Pickett Industries."

"The slide rule has been around since 1621, when William Oughtred put two of Edmund Gunter's plotted logarithm sticks together. K&E began producing them in 1891. Three years of aging and crafting went into each slide rule. But five years ago the tradition died. Today, K&E ignominiously distributes TI calculators.

"Slide rules are already extinct--but what about watch faces? Surely Big Ben isn't slated for the scrap heap. Or is it? This year, between 55 and 60 million watches will be sold, of which some 40 percent will be digital. TI estimates that this slice of the market will reach 75 percent by 1980. By 1990, only nostalgians will wear watches with faces and hands, and no one under college age will be able to read them.

"Glass thermometers have already disappeared from the antiseptic halls of major medical centers. In a few years automobile dashboards will look like fluorescent tickertape readouts. Our lives will be awash in liquid crystal faster than we can say 'Jack Kilby.'

"No doubt we are gaining more accurate readouts and ever smaller equipment, but we are losing a seldom considered philosophical tool. The hands of a clock, the needle of a gauge, the hairline of a slide rule, or the liquid of a thermometer do more than just pinpoint a reading. They symbolize the concepts behind what they record, the cycles, the relativity.

"Just as riding a subway gives us no understanding of a city, using a calculator gives us no understanding of mathematics. We must walk a city's streets to know it, and we must plod through calculations to comprehend numbers. The face of a clock lets us see the relationship between then and now, like a map to help us plan our movements through the geography of time."

"But the digital watch or the calculator transports us blindly from one number to another. Numbers in a void. This is magic, not method. We regress to the mentality of centuries past, when numerical concepts were the exclusive province of the high priests.

"Nonethless, the chips are down, like the leavings of a buffalo herd. Most of us are already accustomed to this isolated-number technology. So goodbye Big Ben, wherever you are; your days are glowingly numbered."

--Reprinted with permission from New Times

Deaf Persons Use Telephone

An attachment devised by engineers at SRI International (a non-profit research firm founded by Stanford University) permits deaf people to communicate with each other by telephone.

The device looks like a small pocket calculator. At one end it has a small readout screen which is somewhat bigger than that on the normal calculator; beneath that is a 40-character pad of pushbuttons which includes the entire alphabet, the numbers from 0 to 9, a space bar, line-return key, shift key, and back-spacer.

When clamped on the handle of a regular telephone, the device will transmit messages as the buttons are pushed, and receive and display messages as buttons are pushed at the other end of the line.

The designer expects this portable aid to be commercially available by 1980 for $200 to $300, and points out that it has the added advantage of giving the deaf person fairly ready accessibility to a wide range of computer terminals already attached to telephone networks.

Development work was funded by a grant from the Rehabilitation Services Administration of the U.S. Department of Health, Education, and Welfare.

--The (Baltimore) Sun via Communication Notes (September 1978)

Comments & Suggestions

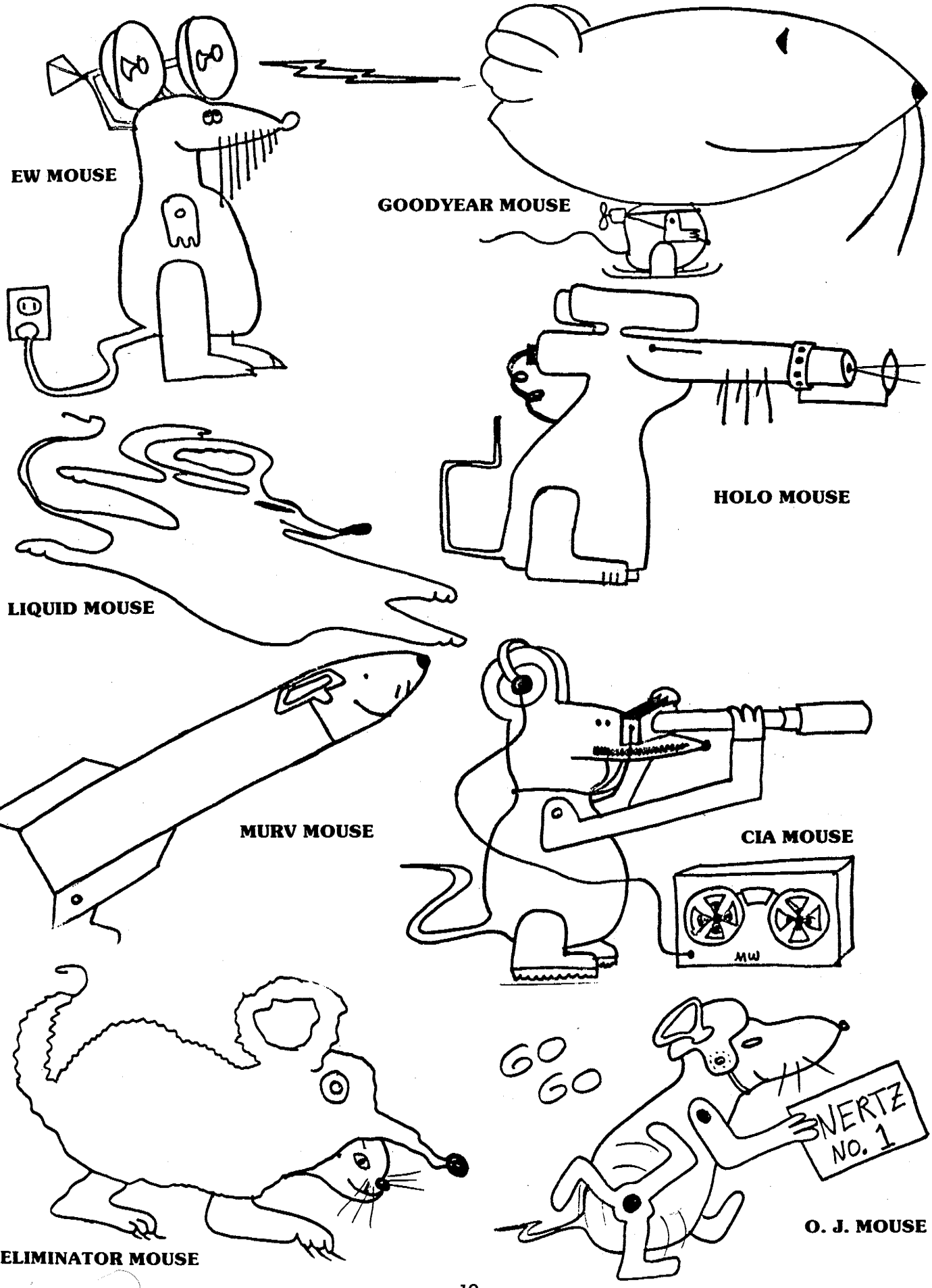
Travis Walton, editor of IEEE's Geoscience Electronics Society Newsletter, recently asked readers for responses to the following ideas about his publication (September 1978). His list is reprinted here to suggest topics that PC-ers might want to write to their editor about.

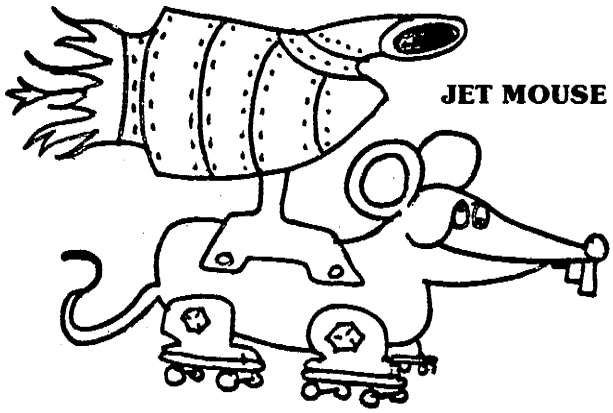
I don't read it so why bother.
Put in more book reviews.
Include short tutorials.
I only read the first page anyhow.
Would like to see forum with both sides of controversial topics.
More energy news.
Some articles on history of various areas of technology.
Cut out most of the IEEE announcements; I see Spectrum monthly.
Put some humor in it.
I won't read it no matter what you do.
Include surveys of what various Government agencies are doing.
Run roster of members.
Run roster, but note geographic area and technical interest if possible.
Would like profiles on people I hear about but do not have a chance to meet.
More inputs from industrial side.
How about some personal experience articles on trips/leisure activities.
Try to get some short student papers.
Let's save a few bucks and stop publication.
Emphasize meeting notices and preliminary programs.
I want cartoons.
I want cartoons to color.

Walton received ten responses, including one "unreasonable demand" from Scotland--"Don't include cartoons to color unless you supply crayons."

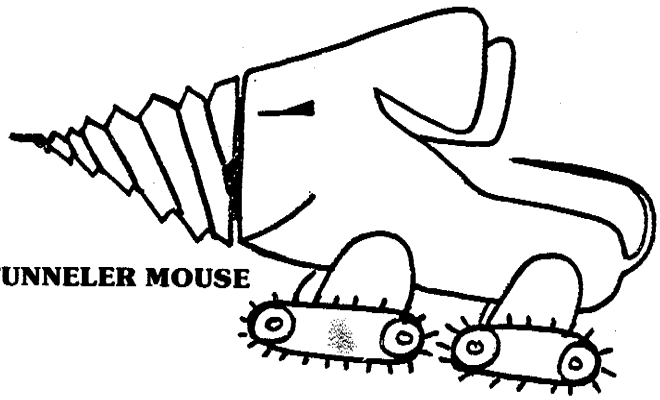
Overleaf is Walton's personal, double-spread response to the Great IEEE Micromouse Maze Contest. His mice only appear to be two-dimensional--each one moves in a cloud of fun, pun, and suggestion.

★

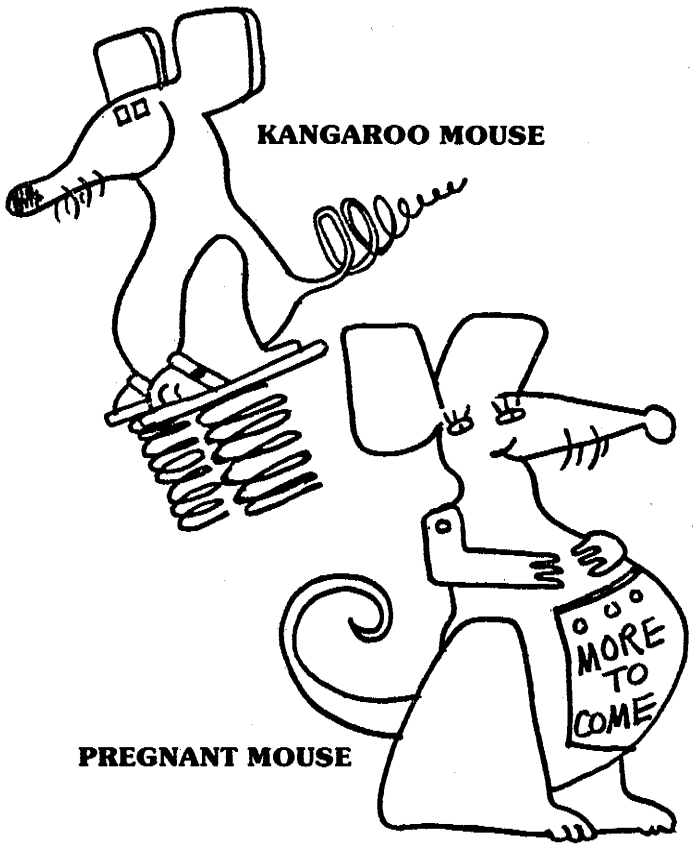

EW MOUSE
GOODYEAR MOUSE
HOLO MOUSE
LIQUID MOUSE
MURV MOUSE
CIA MOUSE
MW
ELIMINATOR MOUSE
GO GO
NERTZ NO. 1
O. J. MOUSE



JET MOUSE



TUNNELER MOUSE



KANGAROO MOUSE

PREGNANT MOUSE

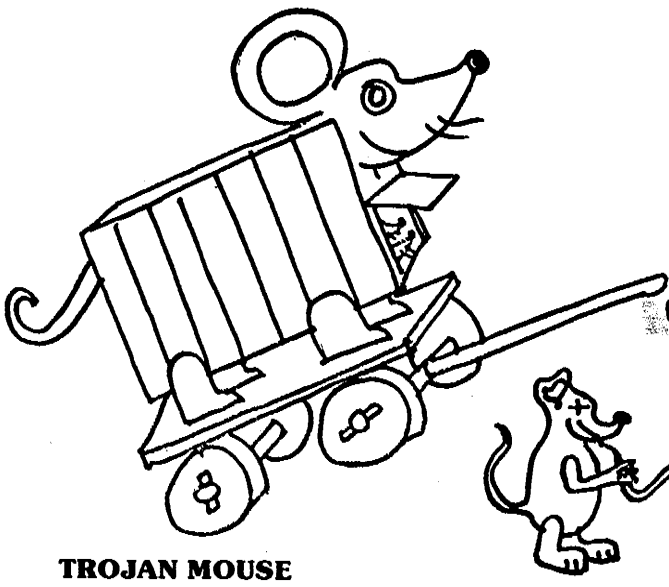
The Micromouse Maze Contest has fostered a lot of sneaky designs. Here are several concepts to look out for.

- PREGNANT MOUSE—at each turn, gives birth to another pregnant mouse, etc., until all possible paths are tried.
- KANGAROO MOUSE—jumps over walls.
- METAL MUNCHING MOON MOUSE—eats its way through the walls.
- TUNNELER MOUSE—drills through/under walls.
- HOWARD COSELL MOUSE—tells it like it is, turning other mice off.
- JET MOUSE—dumb, but fast.
- 3 BLIND MICE—with seeing-eyecaterpiller.
- TROJAN MOUSE—rolls across starting line, then releases thousands of mice to try different paths.
- EW MOUSE—jams electronic signals of other mice.
- RONALD REAGAN MOUSE—always turns right.
- GEORGE MCGOVERN MOUSE—always turns left.
- GERALD FORD MOUSE—stands still, then falls over.
- JIMMY CARTER MOUSE—moves randomly in all directions.
- CIA MOUSE—spies on maze designers.
- 800 POUND MOUSE—crushes maze.
- ELIMINATOR MOUSE—disguised electronic cat.
- MURV MOUSE—blasts over maze.
- O. J. MOUSE—runs to rent ride on another mouse.
- GOODYEAR MOUSE—floates over maze.
- HOLOMOUSE—projects fake maze image, causing other mice to go in the wrong direction.
- LIQUID MOUSE—enters maze, then turns to liquid, flowing to real opening.

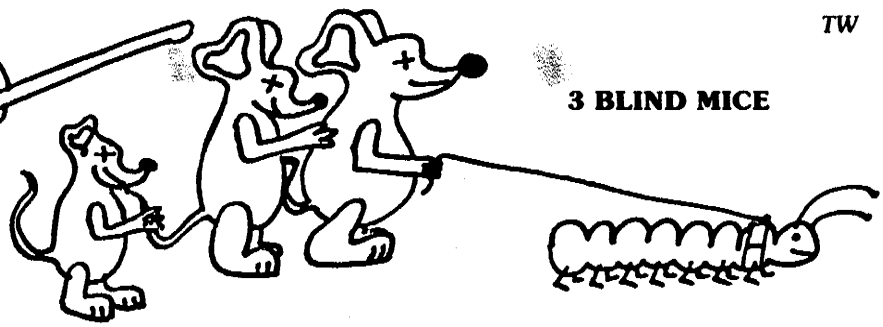
A. Nonymouse

Acknowledgment—basic idea and several of the mouse concepts taken from *Open Channel* column of the June 1978 *Computer*. The rest were home bred.

TW



TROJAN MOUSE



3 BLIND MICE

Engineers' Moving & Changing

At IEEE's Electro '78 Convention in Boston last May, Thelma Estrin spoke on "Upward Mobility and Career Development for Women Engineers." An excerpt from her talk was printed in the Fall 1978 issue of the IEEE Women Engineering Students' Newsletter, and that excerpt is further excerpted here--i.e., the paragraphs referring in particular to women have been omitted. What remains might be called "Upward Mobility and Career Development for Engineers Male and Female."

Dr. Estrin has recently been elected Director of IEEE's Division VI, which consists of the Education and Reliability Groups and four Societies--Professional Communication, Engineering Management, Engineering in Medicine and Biology, and Systems, Man and Cybernetics.

The paragraphs of Dr. Estrin's talk that pertain to all engineers are as follows:

"The recession of the early seventies and the abrupt termination of thousands of successful engineering careers serves as a warning that career planning with alternative options is a high priority task for all engineers. In addition, career planning can help surmount the special obstacles women encounter because societal attitudes and institutions have not yet accommodated to the changing status of women.

"Our complex world of work and increased life expectancy have caused many professionals to realize the need for career guidance. In particular, career planning is critical for engineers faced with rapidly changing technology and a fluctuating supply/demand ratio in the various sub-specialities of EE. While institutions have assumed some responsibility for career development, with managers offering guidance and identifying career opportunities, individuals are primarly responsible for the control and direction of their careers.

"Career and life planning is a relatively new field which takes a "systems view" of a person's life. For engineers it addresses such fundamental questions as: Do I want to pursue a technical or managerial career, or both? What type of job do I want in the next-years? Where is it? What is the knowledge base? What level of experience is required? What skills are needed? What kinds of interpersonal relationships are important to develop? Career planning can also improve short-term decision-making on job assignments, and can provide the motivation for continuing education and the acquiring of new skills.

"Many factors which relate to carrer development apply equally to male and female but there are distinct problems for women in implementing their career goals. Qualified women may be reluctant to move ahead because upward mobility requires significant deviation from social norms. In other cases, women may be hindered by the attitudes of men who are their peers and supervisors. Withholding promotion of women may not be overt but due to unconscious discriminatory attitudes.

"Upward mobility and career development are not subjects for women only. Male engineers can benefit from increased awareness of the problems encountered by their women colleagues. In the next years the probability of working with women engineers will have increased enormously and insights into sexist attitudes can improve working relationships for both men and women. The benefits that can accrue from fuller and more equal participation of women in engineering are many. Women constitute a largely untapped national resource and society will benefit as more women have an opportunity to utilize their talents in engineering careers."

Vacations in West Germany

The Newsletter of the Industrial Communication Council (November 1978) reports on the generous number of paid vacations enjoyed by West German workers:

By law, in West Germany, everyone is entitled to at least three weeks of paid vacation a year; those under 18 or over 35 get four weeks and 72 per cent of all workers get at least five weeks. Moreover, about 80 per cent of all blue- and white collar workers receive a vacation bonus averaging about 40 per cent of the monthly take-home pay.

There also are about 16 paid holidays each year, give or take a few depending on regional differences. West Germans celebrate nearly every major and minor Catholic and Protestant holiday--and stay away from work twice as long as job-holders elsewhere. Christmas officially lasts three days throughout the nation. Then follows a protracted New Year's celebration, a week-long Easter, and a long Pentecost weekend.

Bavarians celebrate Epiphany Day in January. In most states, Corpus Christi, Assumption, All Saints' and Repentance Days are legal holidays. Rhinelanders --in the industrial heart of the country--and Bavarians take at least a week to bring the annual carnival season to a liquid and joyous conclusion. Nearly every village and town sets aside a day to celebrate its founding.

But the German who still feels overworked has yet another option: the six weeks of annual sick leave--at full pay--to which he is entitled. That can be followed by a month's paid convalescent cure at a spa, which can be stretched into an additional period during which the "patient" is required to report to the job but must not work "too hard." The sick-leave system often prompts comments like "I think I'll take my flu this week," or "He's celebrating his grippe."

The best time for scheduling a business trip to West Germany seems to be between late January and late April, or from early September through November. The rest of the time is fragmented by summer and winter vacation schedules.

But April can be a problem because of Easter. As Good Friday and Easter Monday are both legal holidays, most people tend to stretch the four-day weekend by taking off the preceding Thursday and the following Tuesday, and as the schools observe Easter vacation also, most parents want to stay away from work then too.

May is a complete disaster for businesses. It starts with Labor Day, May 1, and then, depending on when Easter was, there's usually Ascension Day, which is a legal holiday; Pentecost, which is celebrated not only on a Sunday but also on the following Monday and frequently on the preceding Friday; and Corpus Christi Day, which is also a legal holiday. The government, moreover, is now planning to make May 23 a holiday--"Constitution Day."

Perspective on Communication

Peter Welch, one of PC's Area Representatives in California and a member of the Speech-Communication Department at San Jose University, suggests that the following remarks on the historical aspects of communication may interest other PC-ers. Frederick Williams of the International Communication Association wrote them for the "President's Column" of the Fall 1978 issue of the ICA Newsletter:

To consider how methods of communication have changed in the history of humankind, suppose that the roughly 35,000 years since Cro-Magnon humans roamed this earth were condensed into the period of one year. In the span of this year, we can mark some of the significant dates in the development of human communication:

* Other than the evolution of speech, which some scholars believe took place during the Cro-Magnon Period, the first major landmark in communication, the invention and implementation of writing around 5000 B.C., would not have occurred until about October 21 in our year.

* Movable type did not come into major use until around 1500 A.D., or December 27 on our calendar.

* If we date the telegraph at around the beginning of the 19th century, it would be about 4:00 a.m. on December 30.

* Mass printing in the second half of the 19th century would be around 4:00 p.m. on the same day, December 30.

* Radio and films coming into wide-spread use in the early part of this century would be around 10:00 a.m. on December 31.

* The television of the 1950s emerged later on this same day, December 31, at 5:15.

* Satellite communication of the mid-1960s would occur about 9:00 p.m. on December 31.

* Home video recording devices would first be used about 11:30 on New Year's Eve, a very busy day!

The remarkable thing about changes in communication is that most of the great advances in our ability to duplicate, transmit, and store messages have occurred in this century. The mass implementation of an "intelligent" communication technology, the electronic computer, is occurring within our lifetime.

At this very moment, we are on the threshold of a number of significant advances in communication. For example, video-disc should be in widespread use within several years. A single disc, about the size of a phonograph record, will eventually carry several hours of audio-visual programming. Each "ring" on a disc carries a numerical address, so it is quite easy for a device to search through any of the many thousand images which a disc can hold and select instantaneously any one given at that address. Raw material for a disc costs only a few cents.

New fiber-optic systems can be used to transmit information with more efficiency than wire. The cost is only a fraction of that of copper. The copper mines of the future may well be our telephone lines.

Computers as calculation and communication devices are becoming increasingly adapted to their users and are decreasing in price annually. For a little over $1,000, it is now possible to buy a "personal" computer about the size and one fourth the weight of a portable typewriter; it will internally manipulate thousands of units of information. Personal computing --for record keeping, numerical calculation, self-instruction, text editing, games, budgeting, or intellectual companionship--may well be the communication feature of this decade.

When we examine the large picture of this evolution of communication in the context of the evolution of humankind, it is remarkable not only that so much is happening in our century, but also that the rate of evolution seems to be constantly increasing. It may well be that when scholars (hopefully humans) a thousand years from now write the history of our times, we will have truly created a revolution in communications.

For those of us who came to maturity in the age of the atomic and hydrogen bombs, perhaps our feared age of mass annihilation will be replaced by an age of mass communication.

Communication A Factor in Morale

J. E. Baird of the University of Michigan and P. H. Bradley of Indiana University recently conducted a study of employee morale in various organizations. Their results, reported recently in the Journal of Business Communication, are discussed in part in Communication Notes for October 1978.

It appears that a supervisor can do more to harm his employees' satisfaction with their job by his style --see negative correlations below--than by the contents of what he communicates to them.

On the other hand, more content items have a particularly high positive correlation with job satisfaction than do items of style--except the ability of the supervisor to listen carefully to his employees.

The table lists details of communication content and communication style in the order of their correlation with job satisfaction:

Communication Content	Correlation with Job Satisfaction
Emphasizes teamwork	.458
Stresses happy relationships	.421
Reinforces good performance	.396
Stresses company goals	.352
Stresses conflict avoidance	.340
Encourages effort	.327
Gives information	.182
Allows unsupervised work	.169
Solicits input from employees	.159
Tells workers what to do	.027*
Communication Style	
Listens carefully to others	.433
Attentive to others	.329
Friendly with others	.327
Shows concern	.323
Communicates comfortably	.215
Communicates actively	.037*
Communicates dramatically	-.087*
Is open with others	-.134*
Quick to disagree	-.199

"Comes on strong" -.307

* Not "statistically significant."

Communication Notes discusses several aspects of these data on job satisfaction, which was only one of the morale factors dealt with in the study. Baird and Bradley urge further research on the role of communication factors in maintaining organizational confidence and cooperation.

Irrelevance

Four articles in Volume 23/Number 4/1978 of The Journal of Irreproducible Results deserve the attention of PC-ers:

D. C. Jolly (Massachusetts Institute of Technology) discusses the "lost theorem" of Euclid, recently discovered "in Instanbul, when an old monastery was razed to make way for a parking lot." The theorem states that "All obtuse angles are equal to the right angle." Jolly gives a geometric proof of this proposition and discusses historical instances of its application.

In particular, he says, many of Archimedes' devices were based on it, but unfortunately, in 212 BC, the fall of Syracuse occurred because of one such construction. By a clever combination of obtuse and right angles, the Father of Engineering had designed a fortification whose entrance could not be stormed--it always seemed to be "just around the corner."

The force sent to defend the fort, however, "could not find the entrance either, and were caught in the open as they milled about in confusion. Archimedes himself was slain while frantically trying to re-derive the lemma necessary to find the entrance."

* * * * * * * *

In "Nutrition of Pet Rocks," F. H. Clews and F. H. Riter (Llenrock University, Stone Flats, NY) report that further study is needed to continue their investigation on the dietary role of calcium and other substances provided for but not consumed by four stones of unknown ancestry.

* * * * * * * *

H. J. Highland (N.Y. State Agricultural and Technical College) proposes a 26-digit "Definitive Untenable Coding System for Numbering Courses at a University." In addition to conventional information like department, academic level, and course number, the proposed system also provides for coding course hours and semester, year of course introduction and revision, levels of instructor experience and student interest, probability of instructor's appearance during class, index of instructor's tolerance for "undress," a density function to indicate the availability of A-grades, and data on required homework, reports, and examinations.

* * * * * * * *

S. J. Haines (University of Pittsburgh) describes a new disease. In his title, he calls it "Disphasia Medicus Multisyllabatorum," but the ailment is not limited to the medical profession; engineers suffer from it also. Disphasia means "speech disorder." In this case, the pathological process consists of the insertion of extra syllables into spoken and written words. Examples of virulent multisyllabalisms noted are the following:

dilatate	(ir)relevancy
dilatation	(in)competancy
(dis)orientate	(im)potency
preventative	militancy
preventatative	succulency
sequestrate	resiliancy
interpretate	(in)continency
assortatative	irregardless

Five "associated findings" are reported: fixate, tolerize, associationships, summate, and quiten.

Haines states that no definitive treatment is known for this disease, but suggests the use of supportive measures such as patience, sympathetic understanding, and gifts of dictionaries or style manuals. Although he questions the efficacy of courses in remedial English, he hopes that his description will "generate further research to elucidadate the mechanisms of this maladady."

No More Writing or Speaking ?

R. J. Hoyle of Halifax, Nova Scotia, writing in the Journal of Irreproducible Results (24:2, 13-14), reports an investigation on changes in the complexity of written English over the last four centuries. His article, "Decline of Language as a Medium of Communication," indicates that sentence length and word length in both American and British documents have shown a downward trend with the passage of time. He mentions such authors as Francis Bacon (1598), William Pitt (1777), and Winston Churchill (1940).

A plot of word length in letters against time in years (5 points, no supporting data) shows a very slight straight-line decline. A plot of words per sentence against years shows two curves, one from data on seven British authors (documents not identified) and the other from data on five unnamed American authors; both curves slope sharply downward and extrapolate to zero word length at about the year 2150--although, we are assured, both curves may actually be asymptotic.

Hoyle points out that "The decline of English as a means of communication is evident here and its eventual demise may be postulated." He foresees one-word sentences and, ultimately, communication by single letters, as in Shakespeare's pilot experiment (1604), "2B or not 2B," and such reductions as tea, see, I, you, etc.

Increases in number of books and periodicals being published suggest that the written language is growing in volume, but it may at the same time be decreasing in content. Hoyle thinks that radio, television, and public address systems will probably make documents obsolete by replacing them with professional talkers.

But he goes even further. Non-verbal communication (NVC) will in turn cause the eventual repression of even spoken language, he says. Our knowledge of NVC through the study of kinesics, extra sensory perception, and so on, will expand until we all "hold our tongues" and communicate solely through posture, gesture, and "long, long thoughts."

Engineers & Writing

A long-time exchange of ideas began two years ago with an article by Terry C. Smith in Technical Communication (Fourth Quarter 1976)--"What Bugs Engineers Most About Report Writing."

Smith analyzed responses to the question, "What is your biggest single problem in report writing?" His subjects were 1033 engineers, scientists, and technicians who attended writing seminars at more than 200 companies in Montreal, Toronto, and 36 of the United States.

The problems named and the percentage of respondents were as follows:

Problem Reported	% of Authors Reporting
1. Organization and outlining	28
2. Lack of conciseness	19
3. Interpersonal difficulties	9
4. Writing	8
5. Lack of time	7
6. Audience	7
7. Grammar (spelling, punctuation, sentence structure)	6
8. Insufficient clarity	5
9. Poor continuity	4
10. Emphasis	3
11. Editing (review of one's own material)	2
12. Technical accuracy	1
Miscellaneous	1

In discussing these problems and percentages, Smith expressed surprise that Editing was specified as a problem by only 2% of his sample. He compared editing with reviewing a completed examination paper and thereby raising its grade from B to A. Many engineers, he suggested, don't recognize that editing not only improves any single document but also makes writing the next one much easier.

More important perhaps, at least in view of what followed, were Smith's comments on the number of respondents (5%) who found Grammar a problem. "Mostly," he wrote, "I am pleased at the self-confidence reflected by this low percentage. My experience has been that many engineers who are quite competent in this area subject themselves to needless worry over minor points that only a grammarian would question."

Moved by this expression of confidence in engineers' knowledge of grammar, reader David B. Whitley of Mount Holly (NJ) wrote a Letter to the Editor. He remarked (Technical Communication, Third Quarter 1977) that although "many grammatically competent engineers may worry needlessly over minor points, most engineers aren't grammatically competent." His letter continues:

"One reason Mr. Smith may feel differently about this is that the engineers who attended his seminars were, by the very fact of their attendance, expressing a concern for writing that the average engineer may not have.

"I think that many engineers would not list grammar as their most significant writing problem simply because they are unaware of how bad their grammar really is. As an engineering graduate who for many years did some technical writing, but who became a full-time technical writer just two years ago, I speak from experience. Only recently, when I began to study grammar in depth, did I become aware of many of the more fundamental grammatical errors. The minor points will take much more study.

"The errors I find in engineering writing, at least those to which I object, are not minor. They are typified by this sentence...

> Each engineer should include a book on grammar, a thesaurus, or at least a dictionary, among the reference books on their desks.

"In the quoted passage, the pronoun their has each engineer as its antecedent. I suggest that the use of a plural pronoun with a singular antecedent is not a minor error; nor is it one that grammarians, enlightened or not, are likely to overlook.

"Any engineer who wants to write well must understand the fundamentals of the art of writing--and it may be unwise for him to assume blithely that he learned these in engineering school. Engineering curricula are too crowded to permit addition of the courses necessary to make engineering students into good writers.

"Good writing can be an important asset to an engineer, winning recognition and advancement for him; bad writing can impede him. I believe that good, effective writing--the kind that wins advancement--is rooted in good grammar. I suggest that any engineer who thinks he writes well test his knowledge, just to be certain.

"To evaluate his knowledge of grammar, the engineer need only go to his local bookstore, buy one of the workbooks containing samples of the tests given to students applying for college admission--tests used to determine placement into remedial, regular, or advanced composition classes--and then compare himself with the worst crop of writers we've ever grown. The closer his score is to the 50th percentile, the less confidence the engineer may have in his ability to write well. At or below that mark, he might consider taking remedial English, or at least hiring a ghost writer for any report he plans to publish."

In a later issue of Technical Communication (First Quarter 1978), an answering Letter to the Editor took up David Whitley's early statement that "most engineers aren't grammatically competent."

Sheldon J. Karlan of Buena Park (CA) expressed agreement, pointing out, however, that "many non-engineers aren't either." Karlan speculated as to "why grammar is out of season among engineers":

"One reason, I suspect, lies with their management. Many company executives fail to place any value on grammar in communication. Secretaries and technical editors are hired to zap that petty problem...

"It seems to me that many of us--too many--in our profession interpret what ought to be in the documents we write and edit, without pressing to make certain that those ingredients are built into the next documents in the cycle. We snicker repeatedly at the poor documents we receive from engineers, but are we willing to help these guys avoid making the same grammatical mistakes over and over again? Do we split hairs over grammar, or do we truly teach good writing?

"If engineers do write poorly, the chances are that they also engineer poorly. In my own work, I frequently observe that an engineer's poorly written sen-

tence can be improved technically as well as grammatically once the sentence is interpreted and revised orally. I think the author has to hear his stuff read back to him before he can actually realize the poverty of his technical expression.

"But who really speaks for the quality of engineering documentation? Who cares? Certainly not the engineer/author. Certainly not the engineering school that 'shoveled' him out. The engineering societies? They're too fragmented. The last hope lies in the engineering companies.

"One would think that engineering companies would sense a self-interest in producing quality documentation, but I doubt that they do. Perhaps it takes the collective efforts of a national society such as STC [Society for Technical Communication] to spark action. We could package a workshop on practical writing problems for engineers, sponsor an engineer-oriented seminar, and give talks to engineering managements within the companies. We could, and should, do something."

Another Letter to the Editor (Technical Communication, Third Quarter 1978) replied to Sheldon Karlan. PC's President Tom Patterson and Past President Emily Schlesinger responded to the question, "Who cares about the quality of engineering documentation?" and to the exhortation, "We could, and should, do something." Their letter pointed out that IEEE's PC Society cares and explained what PC is doing; it also acknowledged the part of individual STC-ers in this effort:

"IEEE/PC offers engineers not only a home-study course and a two-day workshop in technical writing but also a two-day practicum in communication. Some of our instructors are PC members, some are STC members, some belong to both Societies.

"The IEEE Press has published a hardbound collection of articles on technical presentations and PC has re-issued a brochure on report construction; both the editor of the anthology and the author of the booklet are members of STC as well as of PC.

"PC's quarterly Transactions prints original, reprint, archival, survey, and how-to articles on various aspects of communication of interest to engineers, and PC's quarterly Newsletter contains news about communication in general and PC activities in particular.

"So, you see, IEEE/PC is doing something about engineers' writing, and STC is helping. Much remains to be done, however. We hope to expand our current activities, to establish STC/PC cooperation at organizational levels, and to increase the amount of involvement by individual members of both Societies in the work of both Societies."

The appearance of other letters (if any) in this series will be brought to the attention of PC-ers via this Newsletter.

Take a Letter

Abstract of "Writing, Dictating, and Speaking Letters," an article by J. D. Gould and S. J. Boies (IBM, Yorktown Heights, NY) in Science (22 September 1978):

"It is commonly assumed that dictation requires a long time to learn, but authors eventually dictate much faster than they write. Performance results now show that novice dictators can learn in a few hours to dictate with the speed and quality with which they write. However, they do not think they perform this well. Dictators with years of experience are from 0 to 25 percent faster than novices, depending upon the complexity of the letters. Planning time is about two-thirds of composition time, regardless of the method of composition."

Ugh, Shudder

The Underground Grammarian (November 1978), in an item called "Opacity in Iowa," notes that a "curriculum developer" in the Cedar Rapids Community Schools posted the following memo:

> If you know the whereabouts of the Opaque Projector that was stored in the Board Room call 2105. If this item is not located its disappearance will have to be reported as missing.

The Grammarian also records several comments made (early 1978) by a "functionary" of the US Department of Health, Education, and Welfare in evaluating a remedial mathematics and writing program. These are complete responses to questions on the evaluation form:

* The objectives were not to specified are the measureable participants that involves to the fullest extent practicable to the total educational resources

* evidence demonstrated by the standardized achievement test data was surfaced to the desegregation elimination, reduction, and prevention of minority group isolation.

* there is no realistically promises that addresses the needs identified in the proposes program.

* sufficient magnitude in relation to the number of participants cost of project components, contains evidence of the proposes project & a very measureable a mount of funds are very specified in the project program.

The Grammarian calls these "gibberish," and so they are.

Listening

"Are You Really Listening?" asks Muriel Lederer in The Toastmaster for March, 1978. Listen creatively, she says. Effective listening

* promotes understanding

* reduces grievances

* collects new ideas

"There is no such thing as a worthless conversation--if you know what to listen for." Rules for being a good listener include

1. Concentrate on what is being said; don't fake attention.

2. Accept messages in each speaker's own terms; don't be impatient or prejudiced against a speaker because of awkward manner or unattractive appearance.

3. Listen "between the lines" to recognize feeling and tone; don't let emotionally shaded words close your mind--or open it too widely.

4. Give the speaker a chance; don't decide beforehand that you're not interested in his subject and don't formulate counter-arguments while he is speaking.

5. Mentally summarize the speaker's ideas and try to anticipate what he will say next; don't fail to listen thoughtfully.

Speaking

In The Toastmaster for September 1978, Thomas Montalbo calls four kinds of words "Roadblocks to Communication":

1. Abstract words like patriotism, peace, justice, truth--every person interprets them differently. If you need to use them, say what they mean to you, or define them so that listeners can "see" them as pictures.

2. Equivocal words like tough, cheap, litter, streamlined--they have more than one generally accepted meaning. If you use them, state and illustrate exactly what you mean.

3. Emotive words like agitator, communist, lobbyist, flunky--they have different suggestiveness according to the experience of those who hear them. If you want to use them, remember that they are very powerful, that they sometimes "backfire," and that plain facts, well stated, can be just as eloquent.

4. Slang words like okay, the bottom line, get with it--they are often confusing, offensive, and ineffective. If you are tempted to use them, be cautious. Are you sure that you have the latest "correct" expression?

5. Jargon words like overkill, testator, software, zeroing--they clutter, contort, confuse, and antagonize. If you must use them, explain by giving simple definitions and examples, or putting them in familiar contexts.

Remember, however, that words in themselves are not the problem. They are roadblocks only because of the way we use them. Think what they will mean to your audience, and make sure that all understand them as you do.

* * * * * * * *

Once your words are under control, you need to control your fear of making the oral presentation. Mike Major, in the same issue of The Toastmaster, tells "How to Overcome Platform Panic":

1. Admit your fear.

2. Prepare your speech thoroughly.

3. Practice before a live audience.

4. Consciously assume control of your body.

5. Make sensory points of contact with your physical surroundings.

6. Make mental points of contact with your audience.

7. Make your nervous energy work for you--to electrify your listeners, not short-circuit your efforts.

Electricity in America

Turning Points in American Electrical History--ed. James E. Brittain. New York: IEEE Press, 1977, about 400 pp., index; clothbound, $19.45 to IEEE members, $25.95 to non-members; paperbound, $12.95, available only to IEEE members and for educational purposes.

Note: As the bulk of this long review was inadvertently omitted from our October issue, we are reprinting here in full.

Turning Points contains 64 complete and partial reprints of original journal articles, with historical comments, bibliographic notes, and brief author biographies by the editor. The volume is thus a history told by those who made the history. Included are state-of-the-art summaries, discussions of engineering economics, considerations of the social and professional aspects of engineering, and historical surveys, written at various stages of the development of electricity and electronics in the United States. The years covered stretch from the 1740's to 1976.

Although the first reprint in Turning Points describes the work of an American, it was written by the 18th-century British authority, William Watson. It is "An Account of Mr. Benjamin Franklin's Treatise, lately published, intituled Experiments and Observations on Electricity, made at Philadelphia in America."

Watson read his review of Franklin's book to the Royal Society on June 6, 1751. "This ingenious author," he said, "from a great variety of curious and well-adapted experiments, is of opinion that the electrical matter consists of particles extremely subtile, since it can permeate...even the densest metals."

Furthermore, Watson continues,

> if anyone should doubt whether the electrical matter passes through the substance of bodies, or only over and along their surfaces, a shock from an electrified large glass jar, taken through his own body, will probably convince him.

After Watson on Franklin, in Turning Points, comes J. F. Dana on the electric battery. Dana, an early 19th-century physician and professor of physics, introduced both Samuel Morse and Joseph Henry to electromagnetism. In 1819, he designed and described a "powerful, cheap, and easily constructed" electrical battery --not a voltaic cell but a set of glass plates alternating with sheets of tinfoil to replace the "battery" of foil-lined Leyden jars then used to accumulate and store electric charges.

Between Oersted's discovery of electromagnetism in 1820 and the publication of Ohm's work in 1827, some scientists argued that the "galvanic fluid" obtained from a voltaic battery was a mixture of "caloric fluid" (heat) and "electrical fluid." Two reprints in Turning Points express this point of view.

Later, Joseph Henry, professor of physics at Princeton and first Secretary of the Smithsonian Institution in Washington, writes "On a Reciprocating Motion Produced by Magnetic Attraction and Repulsion" (1831). Henry speaks of his battery-powered motor as "a little machine [which], in its present state, can only be considered a philosophical toy," but he thinks that its principle "may hereafter be applied to some useful purpose."

After Henry's report come accounts of other electrical "firsts." Samuel Morse and John Draper write about electricity in long wires (1858). A contributor of "Miscellaneous Scientific Intelligence" to the American Journal of Science describes the laying of the first Atlantic cable (1858) and gives excerpts from Cyrus Field's journal.

A. G. Bell tells of the "galvanic music" that led him to "researches in telephony" (1876). There is Edison's description of his "jumbo" steam dynamo which could "supply 1400 incandescent lamps continuously, and with high economy, without heating the armature, or burning or injuring the commutator or brushes" (1882).

Albert Schmid describes Tesla's alternating-current motors (1892). Steinmetz proposes a law of magnetic hysteresis (1890). There are papers on "electrifying" Niagara Falls in the 1890's; on the "pioneer electric railroad" (streetcar) in Richmond (1891); and on the various aspects of the electric power industry --generation, transmission, and distribution--from the 1890's to 1960, including W. D. Coolidge's account of producing a ductile form of tungsten, a process which revolutionized the design of incandescent lamps.

Next in Turning Points comes a section on communication. A demonstration/discussion of Marconi's apparatus for wireless telegraphy is reported (1897), Michael Pupin describes his loading coil for telephone conductors (1901), and A. E. Kennelly calculates the probable height and conductivity of a layer of the upper atmosphere that might serve to reflect wireless telegraph signals and greatly extend their range (1902).

Large-scale planning is discussed too--A. N. Goldsmith proposes a world-wide communication system and E. F. W. Alexanderson suggests that such a network can be provided by using radio stations like central power stations (1921).

In other selections, important pieces of communication equipment are described by their inventors--the vacuum-tube repeater which reinforces current in telephone circuits (1919); the multi-channel telephone carrier system by which a number of separate messages can be transmitted simultaneously on a single circuit (1921); the filter which separates electric waves according to frequency (1922); Zworykin's kinescope (intensity-modulated cathode ray tube) which replaced the mechanical scanning equipment in television receivers (1933); frequency modulation of transmission waves to reduce noises (1936); coaxial cable (1934) and wave-guide systems (1937) for telephony and television.

In addition to accounts of these advances, the section on communication contains a summary of radar systems developed during World War II (1946), a history of transatlantic communication via submarine telephone cable (1957), a discussion of transoceanic communication via satellites (1959), and a review of advances in the field of antennas and propagation from 1945 to 1961 (1962).

In the same section are also Karl Jansky's early article on "static from the Milky Way," which was the birth-cry of the science of radio astronomy (1932), and Claude Shannon's "Mathematical Theory of Communication" (1948) which linguists, as well as engineers, have found useful.

The next section of Turning Points concerns electronics. It is introduced by "Notes" and a discussion of the "Edison effect," a phenomenon called "puzzling" in this early presentation of 1884--the emission of electrons from a strip of platinum inserted between the branches of the filament in an incandescent lamp. (Twenty years later, J. A. Fleming used this phenomenon to make the thermionic vacuum tube.)

Lee de Forest's account of his grid triode amplifier (1914) is reprinted next, followed by the Varian brothers' discussion of their "klystron" (high frequency oscillator and amplifier, 1939) and the report of the first transistor or solid-state amplifier from Bell Laboratories (1949).

The last section of Turning Points contains, among others, several articles on negative feedback amplifiers from the 1930's, one on the amplidyne (a two-stage electronic amplifier, 1940), and one on ENIAN, the Electronic Numerical Integrator And Computer (1948). The editorial introduction to the last-named account states that this description and assessment of the first all-electronic general-purpose computer was the first of its kind to appear in an engineering journal.

Construction of ENIAC, the introductory note continues, marked the effective beginning of the age of computers. It was the most complex electronic machine built before 1945. Electrical engineers had developed such complex computing systems as the ac calculating board and the differential analyzer, but ENIAC was a far more ambitious undertaking. Many doubted that any machine which used 18,000 vacuum tubes could be a practical success.

In mentioning so many articles (though failing to mention so many others), this account of Turning Points has attempted to review American electrical history briefly, and to suggest that many "goodies" are here for many people--students, scholars, engineers, scientists, technicians, humanists, intelligent and informed general readers.

The book is a fascinating collection of important archival papers, thoughtfully chosen, rescued from library stacks and heavy volumes, and reprinted in the different formats of their first publication. In most cases, long mathematical and theoretical passages have been omitted as being supportive detail of interest chiefly to specialists.

The subjects discussed are inventions and developments that intimately affect modern living, culture, and thinking. The articles are attractively presented, arranged in chronological order under nine headings (Telegraphy and Telephony, Professionalism, Electric Light and Power Systems, etc.), and indexed by author and subject. The writing throughout is logical, literate, and illuminating--here are 64 admirable examples of engineers' technical prose style.

From THE TOASTMASTER

PC-ers may enjoy--and benefit from--supplying and applying in their own professional life detailed suggestions to "flesh out" these subjects discussed in The Toastmaster for June, 1978:

Robert Montgomery writes about "Interruptions: How to Manage Them Before They Manage You." The telephone, casual visitors, and subordinates are the great interrupters, he points out. They disrupt your thought pattern, force you to re-focus your attention, and then leave you to pick up as best you can the thread of your original thinking.

How can you best deal with such triple frustrations? Use an assistant. Delegate responsibilities. Set, adjust, or observe priorities, schedules, and deadlines.

Other possibilities are more "internal": Learn to say, "Please excuse me, I can't break away now." Use your most-efficient hours wisely. Cultivate self-discipline and determine to "work smarter" in your own day-to-day situations.

* * * * * * * *

Vivian Buchan, in "How to Make What You Say Say More," reminds us that our voices are just as important as our words and our ideas. Remember to use pauses, control projection (i.e., adjust voice volume), change pitch, and vary pace in your own public speeches and private conversations.

* * * * * * * *

Stanley Gross, in "Enthusiasm: The Essence of a Winning Speech," suggests that to "turn an audience on" we must speak with whole-body animation. Select a subject that excites you, one that you are personally involved with; use colorful, active words; and re-experience, as you are speaking, the incident feeling, and attitude you're describing.

Microphone Manners

Two types or aspects of public speaking are discussed in articles reprinted in The Toastmaster for July, 1978:

Mike Lewman, in "How to 'Focus' Your AV Narrations" (from Audiovisual Communications, January 1976) writes about reading prepared script. Get into the situation, he says, by picturing yourself as part of it; reflect it in your voice, move your body, and be both physically and psychologically involved in the actions and the emotions you are describing.

"The Microphone: Friend or Foe" from Toastmasters International's Audiovisual Handbook) suggests that before a presentation you should, with the help of an assistant, test and adjust the placement of the microphone and the volume and tone settings of the amplification system.

If there is only one microphone, imagine that your nose is connected to it by a cord that will keep you speaking in one direction, however you move your body.

If you use visuals, get a lavalier microphone, worn on a cord around the neck, or even a wireless microphone.

Don't touch the microphone.

Be aware of how your voice is coming through the amplification system and speak more slowly, distinctly, or directly as necessary.

Keep on the Track

In The Toastmaster for August 1978, David Adamy writes about "Speech Notes: How and When to Use Them." He describes seven methods of keeping "on the track" during the preparation, rehearsal, and presentation of a speech:

1. One Piece of Paper--size 8-1/2" x 11"; it becomes an old friend.

2. Notes from Manuscript--key words and phrases to nudge your memory.

3. Stack of Cards--3" x 5" or 5" x 8"; a major idea on each one; don't drop them as you walk to the lectern.

4. One Little Card--for a speech organized simply and directly.

5. Barefoot in the Wild Woods--no cards or notes, but don't memorize; not for beginners.

6. Mark Twain--a row of crude pictures, carried in the mind, to illustrate main points or ideas.

7. Visual Aids--projections or flip charts, use used as an outline; have a list of titles and numbers from which a particular one can be called up out of sequence.

Choose your own method or methods, but speak, don't read, your material.

Business Letters

John L. Kent, writing in The Toastmaster for September 1978, says that "Your Writing Affects Your Success." Good business writing can put money in your bank account, he tells us. Plan ahead to make your letters helpful, friendly, courteous, and brief. That is,

1. Write on your reader's level.

2. Give information clearly.

3. Tell your story quickly.

4. Use short words.

Meetings

"Planning the Successful Meeting" is the special subject of The Toastmaster for November 1978:

An article called "Planning Your Program" (reprinted from Successful Meetings, 1977, Bill Communications, Inc.) points out that as you plan meetings for a company or department, you should consider ten factors:

1. Kind and success of past meetings held by the group
2. Necessary or allowed expenses
3. Organizational requirements
4. Number and professional status of participants
5. Time and place of meeting
6. Amount of time allowed
7. Objectives of meeting
8. Available resources
9. Ways of getting participation
10. Need for feedback

An article by Donald Kirkpatrick tells what to do when you attend a meeting. The message of "Attend Only Useful Meetings" is "Help make every meeting productive:"

1. Know why you are going to the meeting.
2. Be on time.
3. Keep to the subject.
4. Don't cause problems for the leader by taking part in side conversations, arguing, receiving telephone messages, or being inattentive.
5. Be open to the ideas of others.
6. Take a participant's part in helping to keep order--ask "Can we get back to our main subject?" or "Does this tie in with out purpose?"

(The Toastmaster reprinted Kirkpatrick's article from the World Training Magazine, 1978.)

Mathemathical Approach to LR^2H

A concomitant of the burgeoning of modern mathematics has been the increased use of ingenious symbolism to reduce the writing involved in the communication of mathematical ideas. It seems regrettable that contemporary composers of literature have not seen fit to streamline their communication methods similarly. Through ignorance or design, they remain blissfully aloof from the opportunities afforded to incorporate greater precision in, and to inject a new austere beauty into, their works. Consider, for instance, how much more satisfying and appealing the following well-known classic becomes when clothed in the new notational raiment.

$\exists\, t_o \ni$ at $t=t_o$ $\exists$ * a small girl, denoted by Little Red Riding Hood (notation: LR^2H). LR^2H left her home, taken as the origin, to pay a visit to $f[f(LR^2H)]$, (hereafter denoted by G), where f is the Murrow mapping** (daughter)$\rightarrow$(mother). Her purpose in the visit was the construction of the set $G \cup S$, S being a certain finite subset of the set $C \cup K \cup Q$, where $C = \{\alpha : \alpha = \text{candy}\}$, $K = \{\beta : \beta = \text{cookies}\}$, and $Q = \{\gamma : \gamma = \text{other goodies}\}$.

Now $G \subset F$, a forest, and the set $W_1 = \{ w : w \text{ alive}; w \in W\}$ where $W = \{ w : w = \text{wolf} \in F\}$, was not empty. At $t=t_1 > t_o$, LR^2H met $w_1 \in W_1$, who inquired about the zeroes of $P(LR^2H)$ for $t > t_1$, $P(X)$ denoting the position vector of the argument X, and the dot denoting, as usual, the time derivative. On learning that the

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* Note the gain in precision over the time-honored "Once upon a time, there was ...."

** Also known as the person-to-person mapping.

first zero was at X = G, w_1 embarked on a minimal variational fixed-end point path with termini $P(LR^2H)$ and $P(G)$. Arriving at the cottage of G (at $t=t_2$), he effected the transformation $w_1 \cup G \rightarrow w_1$ and, donning the nightgear of G, ensconced himself in the latter's bed.

At $t=t_3 > t_2$, the condition $\left|P(LR^2H) - P(w_1)\right| < 8$ feet was realized. To describe accurately the ensuing conversation it is necessary to introduce some notation. Let $F_1(x)$, $F_2(x)$, and $F_3(x)$ denote, respectively, the ear length, eye brightness, and tooth sharpness of x. Let $H_1(y)$, $H_2(y)$, and $H_3(y)$ denote, respectively, the efficiency of w_1's acquisition, from y, of energy of the following types: (1) acoustical, (2) visible electromagnetic, and (3) nutritional. The following conversation then took place, where $\langle z \rangle$ denotes, as usual, the expectation value of z:

$$\left.\begin{array}{ll} LR^2H: & F_i(\text{you}) \gg \langle F_i(x) \rangle \text{ , G: \#} \\ w_1: & F_i(\text{me}) \text{ maximizes } H_i(\text{you}), \text{ my dear.} \end{array}\right\} \quad i=1,2,3$$

With the last remark for i=3, w_1 leaped out at LR^2H.

But at that very $t=t_4$, a woodcutter who had random-walked by and overheard the conversation burst into the cottage and axe-ially transformed w_1 into $\bar{w}_1 \in \bar{W}_1$, the complement of W_1 in W. Fortunately, w_1 was now separable, with G as one component, and the universe of discourse happily $\forall\ t > t_4$.

\# The ! here is an archaic symbol used in literature, and should not be confused with the factorial, or Grandma, function.

R. F. Rinehart
CASE Institute of Technology

Ethics & Engineering

ETHICAL PROBLEMS IN ENGINEERING--ed. Robert J. Baum and Albert Flores (Troy, NY, 1978, Rensselaer Polytechnic Institute, 335 pages, softbound (8-1/2" x 11"), $6.00.

Ethical Problems, a collection of 62 reprinted articles, was designed for use in academic courses dealing with engineering ethics. It should be read attentively, however, or at least "sampled" carefully, by every engineering student, practitioner, and associate. And every one whose life is touched by technology should be aware of the issues it discusses.

The articles have been taken from such publications as Whistle Blowing (ed. Ralph Nader et al.), Ethical Problems in Engineering (published by John Wiley and Sons), Cases in Business Ethics (Garrett et al.), Science, and the professional journals of ASCE, NSPE, and IEEE.

The book is organized in four Chapters, each with several numbered Sections and subsections. Chapter 1 contains six formal Codes of Ethics (including those of NSPE and IEEE), along with essays on the historical and theoretical bases of engineering codes and on problems of application, enforcement, and revision.

Chapter 2 presents abstract problems of engineering ethics. Cases are presented briefly and simply, without identifying persons or organizations, and then analyzed by several professionals in the context of one of the engineering society codes. Situations considered involve advertising, conflicts of interest, competitive bidding, employer-employee relationships, societal responsibility, and political activities.

Chapter 3 contains detailed descriptions of actual cases involving engineering ethics. Individuals and organizations are identified, but there are no formal analyses. The biases of the presentations, however, illustrate the complexity of many of the ethical issues on which professional engineers must make decisions. Included in this Chapter are the "stories" of Allan Kammerer, Spiro Agnew, the DC-10 door latch, Carl Houston and welding at the Surry Nuclear Power Plant, Charles Pettis and the Peruvian highway, the three engineers vs. the BART project, the Teton Dam fiasco, the California water hoax, and the Rasmussen study of nuclear reactor safety.

Chapter 4, the shortest main division, contains eight articles dealing with the general question of engineers' responsibilities to society. Should engineers be servants and act as "society" dictates, or should they be guardians and do what they believe is "right" or "best" for society? Cases are presented which deal with general technologies (e.g., water projects and nuclear power) and with groups of engineers (e.g., the Corps of Engineers), rather than with individuals.

Ethical Problems is fascinating and provocative. Every engineer should have a copy and every engineer can afford one. It deserves to be a best-seller, and its contents should be discussed wherever engineered products or projects are planned, worked on, paid for, used, or discarded.

Conservation of Energy

WAGE THE ENERGY WAR AT HOME--J. C. Davis and Claxton Walker (Buchanan, NY: Emerson Books, 1978, 256 pp. incl. glossary, references, and index, $9.95).

Davis and Walker's Energy War is not only a practical how-to guide for conserving energy at the domestic level but also an enlightened discussion of house building, maintenance, and management in relation to heat loss and power consumption. This is a rare book --it can be consulted as a reference work, followed as an instruction manual, and enjoyed as information.

The authors explain basic energy and engineering terms, discuss wind-energy machines, and innovative energy savers. They describe solar energy systems, suggest room-by-room household energy-saving routines, and discuss the energy-related aspects of house design, orientation, construction, and landscaping.

The five chapters on energy-using and energy-controlling devices discuss the characteristics, application, installation, advantages, and disadvantages of various kinds of commercially available material and equipment: specifically, insulation; doors, walls, and windows; climate control systems and machines; stoves and fireplaces; household fixtures and appliances.

Wage the Energy War at Home is instructive and entertaining--good reading for the whole family and for all families.
