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OCEANIC ENGINEERING SOCIETY

NEWSLETTER



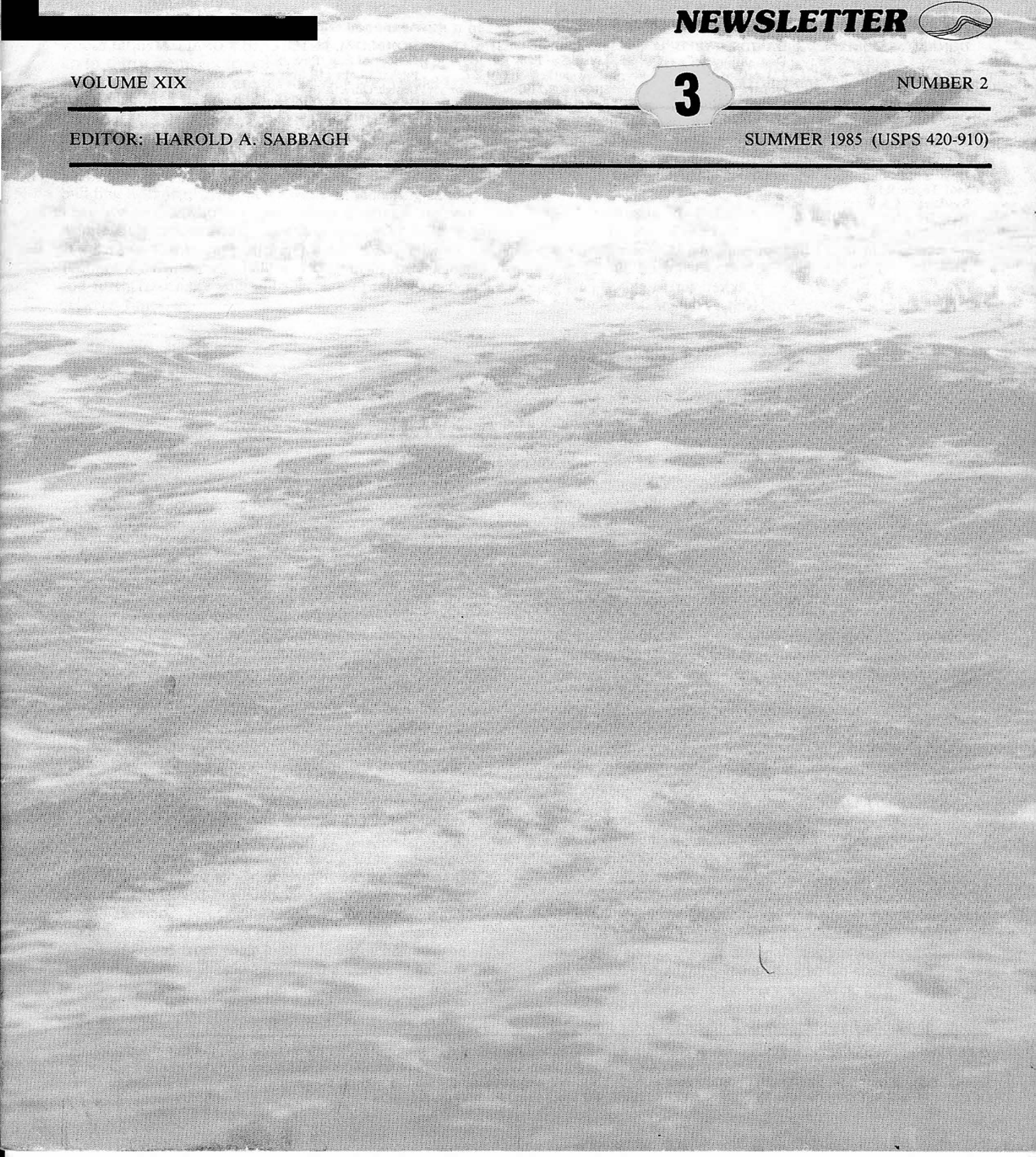
VOLUME XIX

3

NUMBER 2

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SUMMER 1985 (USPS 420-910)



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Constitution and Bylaws Committee

JOSEPH CZIKA

CALL FOR NOMINATIONS OES ADMINISTRATIVE COMMITTEE

The time has come again to request nominations for the OES Administrative Committee. At this point we have twenty-one members serving on the committee with nine whose terms end December 31, 1985. We are able to elect up to thirty members to our Ad. Com. The nine members whose terms are up this year are: Daniel L. Alspach, Lloyd R. Breslau, Robert H. Cassis, Jr., Thomas M. Dauphinee, Edward W. Early, Richard C. Robinson, Harold A. Sabbagh, Joseph R. Vadus, and David E. Weissman.

We seek nominations of individuals willing to help us in building a strong, dynamic Oceanic Engineering Society. They are people who must be willing to attend the two Administrative Committee meetings each year held during the Oceanic Conference in the Fall and the Off-shore Technology Conference held in Houston in the Spring, and furthermore are willing to work on projects in between times.

The Nominations Committee seeks volunteers as well as nominees. In each case, the individuals nominated must express a willingness to be considered by the Nominations Committee and to appear on the ballot. They must provide a brief five hundred word biography listing professional activities, current affiliations, and participation in IEEE activities. We would expect to have no more than fourteen candidates for Ad. Com. positions placed on the ballot. Please submit nominations and supporting material to:

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College of Engineering and Physical Sciences
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Bethlehem, PA 18015

NEWS AND VIEWS

S. H. Durrani, Director, Division IX

I would like to address two issues and invite your comments. Please forgive me if I don't respond to you individually; I tried to do so last time and it quickly became too much to handle!

Election Procedures

Some of you may recall a question I raised last summer regarding multiple vs. single nominations for the two top offices in the Institute (President-Elect and Executive Vice President). To refresh your memory, the procedure is as follows: The IEEE Nominations and Appointment Committee presents several names to the Board of Directors; additional nominations can be made from the floor; and the Board selects the names to be placed on the ballot for these offices. The bylaws allow the Board to pick one or two names for each office (in addition to any other names put up by petition). The question was: Does it help or hurt a volunteer organization like the IEEE to pit two highly qualified candidates against each other?

I received about 45 responses, and a large majority (almost 2:1) favored single nominations. I presented the results to the Board in its November 1984 meeting, but several Directors felt (rightly so) that the sample was too small to draw any general conclusions. Also, some of them had heard from their local "constituents" to the effect that members should be "given a choice". Consequently the Board voted to name two candidates for each office. Since all nominees are highly qualified, we don't have any cause for concern this time. However, one wonders if we tend to give too much attention to a vocal

minority at the expense of the silent — or soft-spoken — majority.

Finances and Dues

In recent years, several Societies have built up healthy financial reserves. Of course this did not happen by chance or by itself; they worked hard to get the income through publications and conferences, and then preserved the reserves through prudent management. Similarly, the general fund has built up a large reserve. However, the reserves held by Regions and Sections are much smaller.

In addition, many Sections — both large and small — are finding it hard to maintain normal activities because of increased costs and almost constant income. Their income primarily consists of a "rebate" sent by Headquarters, computed on the basis of number of members, meetings held, and certain other criteria. The average rebate is between \$3 and \$4 per member per year, compared to the basic annual dues of \$52.

Clearly the Sections need additional income, and the matter has been discussed by the Board of Directors on several occasions. In early 1984 the Board allocated about \$38,000 from the general fund to support needy Sections; later in the year it approved an additional \$90,000 for this purpose, this being the amount received by Headquarters as its share of surplus from the Electro conference. However, these are temporary measures, and the question is how to find a permanent remedy, assuming that costs are kept to a minimum and we still need additional income to support Sections and Chapters.

Several approaches have been proposed, some of which are highly controversial. Let me summarize a few and ask your opinion.

1. Allocate a fixed fraction of the basic dues — say 10% of the \$52 — to Sections. The drawback: This will reduce the amount left over for other services, which will have to come from the general reserve.

2. Raise the basic membership dues by say \$2, and allocate the entire increased revenue to Sections. Counterpoint: Are Sections the only entity needing support? How about the needs for additional funds to support Professional Activities in Regions 1 thru 6 (U.S.A.), where a \$2 increase is also being suggested? Should the dues be increased by \$4 in these regions, and if so, is that too high an increase?

3. Take a part of the Society reserves and give it to Sections. Counterpoint: This is like robbing Peter to pay Paul. The Societies worked hard to build up their reserves, and no money should be taken away from them arbitrarily.

4. Take a certain fraction of the surplus from each successful conference (or a fraction of the surplus above a certain threshold), and give it to Sections. Question: Does

it mean penalizing success? And who will come to the aid of Societies if they start losing money?

5. Help the Sections help themselves, through joint activities with Societies. For example, Societies can offer financial and administrative cosponsorship of conferences and short courses to Sections. Similarly, Societies can assist Sections and Chapters in better serving the members, e.g., by providing Distinguished Speakers at no cost, or by partially reimbursing the expenses of Chapter meetings.

My preference is for the last approach, because I believe self-help is the best help! Moreover, I have a high regard for the capabilities of Section leaders; given the freedom to experiment and proper motivation, I am sure they will come up with many innovative ideas for new revenues. I also believe Societies are ready to help whenever a specific request is made by a Section or Chapter. What we need is a concerted effort to develop a few pilot projects and show what can be done.

Any takers? I would welcome your offers to help, or your comments on your preferred approach for a workable solution. Please write to me at NASA-Goddard Space Flight Center, Code 540, Greenbelt, MD 20771.

THE FORMATION OF CHAPTERS OF THE OCEANIC ENGINEERING SOCIETY

The Oceanic Engineering Society is unlike any other Society in the IEEE. We are Electrical Engineers addressing the technical problems related to one part of the World's environment. It is a second society for most of us, since we derive our specific technology in topics that are largely covered by another Society, AESS in my case. We are drawn together because the Ocean involves some serious technical challenges, and the solutions are generally multidisciplinary in nature.

Increasingly it is becoming clear that not only are Ocean-related problems drawing solutions from many corners of Electrical Engineering, but they also are very diverse geographically. The problems of an engineer in Houston, struggling with Petroleum recovery issues, differ hugely from the Engineer working in defense systems in San Diego, or the concerns of the research engineer in Cambridge, Mass. All do have common threads, but we, as OES members, are certainly distinguished by our diversity.

A national society, representing the needs of this entire group, cannot meet very well the specific interests represented by the local regions. We must diversify ourselves geographically to serve well, and this is done best by the establishment of strong local Chapters. Our National Society, moreover, attempts to hold its Annual Meetings in the local areas where the strength is present to organize a worthwhile program. It is necessary, therefore, that a vigorous local working group exist at each potential Conference site to assure that a worthy Annual Meeting may be mounted effectively. Obviously then, the Society needs strong local Chapters to serve both its avowed purpose, and to reinforce the specific regional quality of its technology.

Much forward motion has been seen in the past year from our joint effort to bring local Chapters into being. I am pleased to report on the results of the work of a large number of people laboring to achieve these purposes.

There is action in process in nine regions, in various stages of completion. The following table summarizes the status of each effort.

Area	Leadership chosen?	Petition filed?	Organizational meetings?	Tech. meetings?
New Engl.	yes	approved	yes	yes
San Diego	yes	approved	yes	no
Seattle	yes	pending	yes	no
Halifax	yes	approved	yes	no
Houston	yes	no	yes	yes
So. Fla.	yes	no	no	no
Wash. DC	yes	no	yes	no
S. Fran.	yes	no	no	no
Los Ang.	yes	no	yes	yes

In New England, the first Chapter completed a successful initial year with six superb programs. Mike Serotta has shown a large measure of that needed ingredient, leadership, and the results are a credit to him. Chapters are being organized by two past-Presidents of the Society,

in San Diego by Lloyd Maudlin; and in Seattle by Ed Early. It is a credit to these men who have given so much and yet are willing to take on yet another important role. The San Diego Chapter will pick up much momentum from their OCEANS' 85 effort, while the Seattle Chapter will undoubtedly offer a proposal to host OCEANS' 89.

Halifax, the site of our 1987 Conference, has a Chapter well along in formation. The leadership here is Dr. Ferial El-Hawari, who has given several well received papers at past Conferences. Her enthusiasm is much appreciated.

In San Francisco, Capt. Bob Cassis is starting to pull together the people to make a Chapter function, as are Dr. Tony Eller, and Dr. Joe Czika in Washington. Tony is, and Bob was, Vice-President of the Society, while Joe is currently Secretary. In Los Angeles, Larry Bacon, also a past Vice-President, is working steadily to get a Chapter going. He has already formed a group, and has held two meetings with technical programs, all without waiting for the formal petition process.

In Florida George McClure, Chairman of the So. Florida IEEE Council, has offered to form a Chapter, which will do a lot to support their forthcoming proposal to sponsor OCEANS' 89. Dr. Rui deFiguieredo, of Rice University in Houston, is leading a strong effort to form a Chapter in that region, both to reinforce the Houston Section, and to strengthen this Institute's participation in OTC. At their final meeting of the 84-85 year, the Houston Section met with their fledgling OES Chapter in a joint technical program with an OES Speaker.

What is next? Nine Chapters are a lot for this young Society to get organized in a short time, and our interests as a Profession are so regional that potential growth in Chapters is limited. We look with interest on the potentials of the New York region, as well as New Orleans, for future starts. We will welcome suggestions, as well as labor, to make this effort grow.

Arthur Westneat
Chapters Chairman

PUBLISHING BOOKS WITH THE IEEE PRESS

1. General

The expanded IEEE PRESS stands ready to publish quality books on all subjects of importance and interest to the IEEE membership and the profession. Book proposals from Societies, other IEEE entities, and individuals are encouraged.

Besides serving the information needs of the profession, the IEEE PRESS is organized to contribute financially to the Institute and its Societies and, at the same time, to offer financial returns to authors and editors at least comparable to those of other publishers.

A decision to publish a proposed book is based, in part, on the endorsement and sponsorship of the Society or Societies in which its subject matter falls. All proposals are carefully reviewed, and quality, need, and marketability are taken into consideration.

Brief descriptions follow of the types of books published, the organization of the PRESS, book sponsorship, the business and financial arrangements, and the procedures for proposing a book.

2. Types of Books

Various categories of books, organized into series, are published or are planned. These include the Selected Reprint Series (a prominent feature of the past book program), the Tutorial Book Series, and a series based on journal special issues. Other categories are original professional and reference books, compendia, and bibliographies.

These categories span a spectrum of level of involvement of authors/editors. At one end of the spectrum are the books of selected reprints, which consist of collections of papers that originally appeared in various publications

at various times, with limited introductory and transitional material provided by the editors. At the other end are specially written books requiring major investments of effort and time by the authors. In between, are books that contain varying combinations of reprinted and authored material.

3. Organization of the PRESS

The IEEE PRESS is guided by a structure of volunteers, whose charge is to assure that it operates for the benefit of the Institute, its Societies, and the membership. Much of the actual operation is carried out by editorial, marketing, and business staff at the IEEE.

The head of the volunteer structure is the Editor in Chief, who is appointed by the Board of Directors and who serves on and reports to the Publications Board. He is assisted by Editors of book series, as needed, and by an Editorial Board appointed by the Publications Board. Series Editors set up their own advisory committees for planning and reviewing purposes, as warranted.

4. Book Sponsorship

The idea for a book often, though not always, originates within the Society (or other IEEE entity, such as the Educational Activities Board or the History Committee) most closely identified with the subject of the book. When proposed by an individual, the endorsement of the appropriate Society is sought. After an entity proposes or endorses a volume that is accepted for publication by the PRESS, that entity becomes the sponsor of the book. As such, it shares financially in the success of the book, as described on the following page.

5. Business and Financial Arrangements

Ground rules have been established (1) to achieve a straightforward business operation of the PRESS, (2) to provide financial incentives to book sponsors and authors/editors, and (3) to accommodate a wide range of book types. Highlights are given in the following paragraphs.

Funding: The costs and financial risk for books are borne by the PRESS.

Book Pricing: A list price is set for each book that is aimed at optimizing revenue from nonmember sources. A member price is based on a discount (10% to 40%) from the list price. Discounts are available for bulk purchases.

Reprint Fees: A fee of \$5 per page is paid, on book publication, to the IEEE publications from which material is reprinted. This payment allows the original IEEE publishing entity to benefit from reuse of its material.

Royalty Payments: An incentive payment based on net income is paid in the form of a royalty. This royalty is divided between the book sponsor (usually a Society) and the author or editor of a book. For 1985, the scale is as given below. Percentages are of net sales income.

8%	of the first \$10.4k of net income
10%	of the next \$10.4k
12%	of the next \$10.4k
14%	of the next \$10.4k
16%	of the next \$10.4k
18%	of the next \$10.4k
20%	of the next \$10.4k
22%	of the next \$10.4k
24%	of the next \$10.4k
26%	of the next \$10.4k
28%	of the next \$10.4k
30%	of net income above \$114.4k

The dollar amounts are adjusted each year, according to the Consumer Price Index, for new books published. Once set for a given book, the dollar amounts do not change. Payments are made for five full years at the end of each fiscal year.

It should be emphasized that these royalty figures represent the total payment, which is divided between the sponsor of the book and its editor/author. How these royalty payments are apportioned depends on the kind of book, with the author getting the major portion for a specially

written book, on the one hand, and the sponsoring entity getting the major portion in the case of a collection of reprints, on the other hand. (Examples: For an authored book, 9/10 of the royalties to the author, 1/10 to the sponsor; for a reprint book, 3/5 of the royalties to the editor, 2/5 to the sponsor.) As pointed out above, many books will fall between these two extremes of the spectrum. In general, the individual author/editor gets a larger share of the royalty dollar the greater his or her investment of time and effort.

6. Proposing a Book

Individuals and Societies are encouraged to submit proposals for IEEE PRESS books.

It facilitates their review if proposals are submitted in a standard format. Special proposal forms are available for Books of Selected Reprints and also for Tutorial Books. Blank forms, or guidelines for proposing books of other types, should be requested from the Managing Editor, IEEE PRESS (345 East 47 Street, New York, N.Y. 10017). Completed proposals should be submitted to the same address. Telephone queries to the Managing Editor are welcome (212-705-7557).

Individuals proposing a book should seek the endorsement of the Society (or Societies) whose technical interests cover the subject of the book. They are encouraged to obtain this endorsement prior to submitting the proposal to the PRESS, although the proposal can be submitted in parallel to the PRESS and to the appropriate Society for simultaneous consideration when saving time is important.

7. Summary

The IEEE PRESS is operated to serve the information needs of the profession and, at the same time, to make a financial contribution to the Institute and its Societies. It accomplishes this by publishing books of high quality and marketability. Authors and editors benefit from the success of books by sharing incentive royalties with book sponsors.

Book proposals from Societies, from other IEEE entities, and from individuals are welcome. Publication decisions are reached by the Editors and Editorial Board of the PRESS after careful review.

The format of a proposal varies depending on the type of book. Proposal guidelines and forms are available from the Managing Editor of the IEEE PRESS.

Statements by Candidates for 1986 President-Elect

The following independently written statements by the two candidates for President-Elect, Mr. Henry L. Bachman and Dr. Jose B. Cruz Jr., have been especially prepared for readers of IEEE newsletters. It is hoped that these statements will supplement the biographical sketches and other statements made by the candidates which appear elsewhere in the IEEE literature and that they will assist IEEE member voters in the election process.

Statement by Henry L. Bachman

My objective, as President of the Institute will be to assure that the Institute will provide the basis for the health and growth of the profession and its members, for their own benefit, for the benefit of the electrotechnology industry and supporting institutions and, as a result, for the benefit of the members of society at large.

Essential to accomplishing this objective is the need to maintain the vigor of the technical societies and to see that these activities are not compromised. The professional activities of the Institute must support these technical activities by encouraging and assisting able engineers to join and to prosper in a lifelong career within the profession. These activities together, must take action to strengthen the profession's image and its contribution to public policy and, by so doing, create the environment that is necessary to enhance the strength and stature of the profession and its members.

More specifically, there is a need to derive more benefit and broaden the impact of technical activities by better application of the resources and capabilities provided by the Regional and Educational activities, particularly as to the need to increase the utilization and make more productive the engineers that are already working, to prevent the loss of older engineers from the profession, and to be more responsive to the careers in industry with requirements for competitiveness in product cost and quality. This requires improving the ability of the Institute to deliver relevant technical information to the members, economically and effectively, both to individuals or local groups, and with emphasis on life-long learning through continuous education.

There is a need to assure the freest dissemination of technical information, as embodied in presentations or products, consistent with proprietary needs and national security, in order not to discourage the economic and intellectual pursuit of technological innovation. There is a further need to encourage the contributors of such innovation by proper recognition of their rights to intellectual property.

There is a need for the Institute to direct more attention to external affairs. With employers of engineers, for example, to further the understanding of the contribution of the Institute to all enterprises. With institutions at the local level, especially when certain member problems and concerns have more relevance and urgency regionally, than nationally, and with the media, and the public they serve, to combat the limited awareness and often, therefore, the low regard for technology, by speaking out knowledgeably about technology to the government and the public at large. The recently established Industrial Relations Committee, increased USAB interactions, through PACE, with local governments, an IEEE Annual Conference, and more media attention to Institute awards are examples of such public information programs which require more emphasis.

Statement by Jose B. Cruz, Jr.

Extend technical and educational services to a broader member base

IEEE is the largest technical professional society in the world. It disseminates numerous major advances in the field through its technical publications and technical conferences throughout the world. Our publications and conferences are preeminent but we need to extend our publications and conference activities to serve a broader member base. We should have more offerings of tutorial and practice-oriented material to assist our members in their career-long professional development. We need to develop effective delivery mechanisms using our own computer/communications technology.

Continuing education is for everyone—Advances in computers, communications, microelectronics, electronic materials, optoelectronics, electromagnetics, systems, power and energy, and other areas have been dramatic in recent years. IEEE members must continuously learn a significant amount of new material to maintain technical viability. The nature of our profession demands that life-long learning, in its broadest sense, occupy a central place in our individual activities.

Enhance opportunities for professional development—The most critical factor affecting the professional development of engineers is the presence of challenges for creativity and opportunities for growth in the work environment. IEEE should work with industry leaders to address the productivity problem through greater incentives for professional growth. We need to match our educational offerings with industrial challenges at the workplace.

Improve communications—We need to express our concerns and opinions to IEEE officers. Our representatives want to hear from us so that they can represent us more effectively. More communications with our local Section/Chapter officers, Society officers, and Institute officers should lead to a more effective organization.

Forecast engineering manpower demand—When demand exceeds supply, more high school graduates are induced to seek a career in engineering. Unfortunately, there is usually a lag of four to five years before an increase in supply is felt. This could then lead to an excess supply of engineers. We need longer term forecasts to improve stability. We must be very careful not to overestimate demand.

Fight Age Discrimination—IEEE should assist industry to achieve a more effective engineering manpower utilization. IEEE must assist its membership against age discrimination practices which may occur in advertising, early retirement, employment, promotion, transfer, or other forms. IEEE should support those industry leaders who create the necessary environment for employed engineers to have full and productive careers.

We Need Your Feedback

Based on my conversations with numerous IEEE members throughout the world I know that we need more services for technical and professional development in our stride for greater productivity, and we deserve improvement in our social and economic status. I believe that I have broad support for my goals to improve member services and to enhance the status of the engineering profession. I urge you to express your feedback by exercising your right to vote.

Statements by Candidates for 1986 Executive Vice President

The following independently written statements by the two candidates for Executive Vice President, Mr. Merrill W. Buckley, Jr. and Dr. Emerson W. Pugh, have been especially prepared for readers of IEEE newsletters. It is hoped that these statements will supplement the biographical sketches and other statements made by the candidates which appear elsewhere in the IEEE literature and that they will assist IEEE member voters in the election process.

Statement by Merrill W. Buckley, Jr.

The duties of the Executive V.P. are probably the least explicit of any of the IEEE corporate officers. This has been particularly evident since the adoption of the President-Elect concept in 1982. The value of the position therefore depends in large measure on how the person who is elected approaches their term of office.

If elected, I would enthusiastically undertake the usual functions of the office which are to assist the President, to chair the Conference Committee, and to coordinate and report on the activities of the committees assigned to the Executive V.P. But I would also spend a good deal of time on other important Institute issues. The recently completed Centennial Year survey of what our membership thinks should be done to improve the IEEE would be my agenda.

Since our bylaws state that "the Executive V.P. will be responsible for broad corporate matters and may appoint such ad hoc committees as may be required to discharge his/her duties" there is a ready made mechanism available to work on key issues.

I believe we need, and would initiate, ad hoc committees of our best people to address the membership's concerns and to develop specific recommendations for Board of Directors action on such issues as:

- Enhancing our professional image
- Low cost continuing education
- Application oriented publications
- Improving the IEEE/industry relationship
- Worldwide distinguished lecture program
- An affordable dues structure
- Priority review for professional activities
- Continuing support of AAES

Statement by Emerson W. Pugh

It is an honor to be considered for the office of Executive Vice President. If elected, I will devote myself to that position with four primary goals:

- Improve the volunteer structure of IEEE to attract our best members, to use their services wisely, and to assure that their efforts are applied to the good of all members.
- Help our members increase their technical competence through improved IEEE publications, conferences, and educational programs.
- Increase the monetary rewards and other recognition accorded to engineers through improved public awareness of their contributions and by developing broader opportunities for engineers.
- Make the international engineering community, and IEEE in particular, a force for promoting world peace and a better life for all.

In working to achieve these goals, I will seek the advice and help of as many members as possible; I will draw on my work experience in industry, government, academia, and international technology development and on my fifteen years of experience as an IEEE volunteer—including conference chairman, transactions editor, society president, Publications Board vice chairman, and member of the Board of Directors.

A specific function of the Executive Vice President is to chair the Conference Board, created last year to address a number of specific problems. As a member of that board this year, I am obtaining insights that will help me be more effective during the one-year term of the Executive Vice President.

ELECTRICAL PERSONALITIES

Reprinted from
Instrumentation and Measurement Society
October/November, 1984

ANDRE MARIE AMPERE (1775-1836)

The invention of the voltaic cell in 1800 gave electrical experimenters a source of constant flow of current. Seven years later the Danish Experimenter, H. C. Oersted, announced that he would attempt to establish a relationship between an electric flow of current and a magnetic needle. Yet it required thirteen years more for this brilliant discovery to be made and announced by Oersted in 1820.

The news of Oersted's experiment reached Paris thru Arago who repeated the experiment at a meeting in Paris on September 11, 1820. In the audience was Ampere, then professor of mathematics of the Ecole Polytechnique. So deeply was Ampere impressed by the Oersted experiment that within a week he himself had repeated the experiment and elaborated it into a number of other basic relationships demonstrating the behavior of electric current flowing in straight and in formed conductors. On September 18th, Ampere presented before the Academy his observations establishing the science he designated as "electrodynamics." In a paper entitled "Experiments on the New Electrodynamical Phenomena," published in 1822, Ampere stated, "I have determined to use the word electrodynamic in order to unite under a common name all these phenomena, and particularly to designate those which I have observed between two voltaic conductors." He then distinguished electromotive action as being of two kinds, which he designated as those of electric tension and those of electric current. The former exists, he said, when two bodies are separated from each other by a non-conductor, such as the tension between the poles of a voltaic cell before they are connected by a conductor, such as the tension between the poles of a voltaic cell before they are connected by a conductor. In the case of flowing current the second exists where elements form part of a circuit of conducting bodies. Thus, pointed out Ampere, two bodies similarly charged electrostatically repel each other, whereas two conductors carrying currents in the same direction attract one another. Ampere was convinced that magnetism was an electrical phenomenon and that the direction of motion of a magnetic pole, when adjacent to a current-carrying wire, was neither towards nor away from the wire "but in a line at right angles to a plane passing through the pole and the conductor." The force of this attraction or repulsion, he proved, was directly proportional to the strength of the currents, and inversely proportional to the square of the distance between them a relationship which prompted Clerk Maxwell to write that these achievements had "leaped full grown and fully armed from the brain of the Newton of Electricity."

The relationships between parallel wires were then expanded to include conductors bent into the forms of coils and helices, some fixed and some free to move on pivots, and to show that such a spiral coil (solenoid) when carrying a current behaved exactly like a magnet. Such a coil, if delicately balanced and free to swing, should swing and adjust itself to the earth's magnetic field; this he arranged and demonstrated, the reby causing a current-carrying wire to behave like a magnetic compass needle. He could then explain the earth's magnetism by terrestrial electric currents that circulated in the earth from east to west. Such currents, he speculated, might be caused by chemical action between the heterogeneous materials in contact within the globe, as Volta had demonstrated with different metals in contact.

Ampere formulated these observations into some general rules: (1) Two electric currents attract when they flow parallel to one another in the same direction and repel when they flow parallel to one another in the opposite direction. (2) It follows that when metallic conductors along which currents flow cannot turn into the parallel plane, each conductor tends to move the other conductor into a position parallel to it and in the same direction. (3) The attractions and repulsions are absolutely different from ordinary (electrostatic) electricity. (4) All the phenomena disclosed by Oersted regarding the relationship of the flow of an electric current and a magnet are covered by the law of attraction for two electric currents. This law follows from the deduction that a magnet is a product of electric currents produced by the action of the particles of iron on one another, similar to those of a voltaic pile.

Ampere recommended two experimental approaches to determining the mutual action of currents. The first consisted in actually measuring the forces at varying distances; the second consisted in balancing the effects produced by the two currents acting on a third body in keeping it in equilibrium. This second method (called the null method) is experimentally the more accurate. To apply the second method and determine if the forces were in true balance, Ampere arranged two coils on his apparatus and mounted them so that they were equally and oppositely affected by the earth's magnetism, forming, the reby, and a static pair of coils. With this and similarly original equipment he arrived at the following four observations:

(1) The effect of a current is reversed when the direction of the current is reversed. (2) The effect of a current flowing in a circuit twisted into small turns is the same as if the circuit were expanded. (3) The force exerted by a flowing current on an element of another circuit is at right angles to the line uniting them. (4) The force between two elements of circuits is unaffected when all linear dimensions are increased proportionately, the current-strength remaining unaltered.

As one who had mastered the mathematics of his day at age 12, Ampere at 18 had read the main works of Lagrange, and later was a teacher of mathematics at

Lyons and at Paris; Ampere had acquired habits of clear, exact thought which resolved ideas into quantitative elements. His electrical investigations were therefore developed into a hypothesis that magnetism was essentially a phenomenon of electrified particles of matter. It must be borne in mind that when Ampere was formulating his theories, there was still no conception of the idea of a difference of potential or that of electromotive force, and that Ohm's guiding law had yet to be determined, given to the world, and tested. Nor could Ampere show the difference between an electric current and the electromotive force that caused it to flow. He did state that a new instrument was available for detecting current flow and that from the nature of the new current to be measured this instrument should be called a galvanometer. Just as an electrometer measured "ordinary" electricity, so the new galvanometer would measure the flow of electricity. Ampere intended his instruments to operate along the lines of Oersted's pivoted needle but, a few months later, J. S. Schweigger of Halle brought out the first true galvanometer consisting of a coil of many turns of wire and a magnet hung on a silk thread in the center of the coil. Ampere suggested a method of signaling at a distance by placing a galvanometer in a circuit of great length.

The ideas propounded by Ampere found slow acceptance because his explanations of electric behavior showed the forces to act at right angles to the directions of flow of these forces and were therefore counter to Newton's ideas of forces acting in straight lines. However, later Ampere's explanations were endorsed by such recognized authorities as Fourier and Laplace and thereafter received ever-widening acceptance.

To Ampere the world of science owes a debt for his part in formulating the then little-understood electrical phenomena into a measurable and corroborative body of experiments and theory. His personal life was a disciplined and joyless one. His father was a victim of the excesses of the French Revolution, a tragedy that almost destroyed Ampere. His scientific interests were broad, and his published works included studies in mathematics, physics, chemistry, psychology, and natural history in addition to those in electricity. In his advanced years he developed a new classification of all the sciences and, by a process of subdivision, reached a total of 128 sciences and subsiences including one he called "cybernetics," another "technesthetics." His work and his name have become perpetuated by action of the International Congress of Electricians who designated the practical unit of electric current as the ampere.

'TIS A PUZZLEMENT

SOLUTION TO LAST PUZZLE:

Up on the High Wire

Last quarter's puzzle had you running off to join the circus and trying to find a way to measure the tension in a tight-rope without the benefit of a strain gage.

A cable or chain supported at each end sags in the middle, and the greater the tension on the line the less it sags. The shape of such a cable is called a catenary curve. You can derive the equation for a catenary curve by working with a chain as a model and using the links in the chain as the differential elements. The forces acting on each link are: (a) the horizontal component of the tension in the chain, (b) the weight of the link, and of all links below it in the chain, and (c) the supporting force exerted by the links above. This derivation leads to the following differential equation:

$$\left(\frac{W}{F}\right)^2 \frac{df(x)}{dx} = \frac{d^3 f(x)}{dx^3} \quad (1)$$

W =weight per foot of chain

F =horizontal component of tension in the line,

which can be solved to give the catenary equation:

$$f(x) = \frac{F}{W} \left(\cosh\left(\frac{Wx}{F}\right) - 1 \right). \quad (2)$$

(This equation can also be obtained from the *Electrical Engineer's Handbook—Electric Power*, 4th Edition, Pender & DelMar, Editors, Chapter 14.)

The sketch below shows the important parameters of this problem, which are:

\bar{W} = total weight of cable (lbf)

T = tension in the cable (lbf)

F = horizontal component of T (lbf)

$\frac{\bar{W}}{2}$ = vertical component of T (lbf)

L = distance between the two support points (ft)

D = sag in the cable (ft)

W = weight per foot of cable (lbf/ft)

Z = length of cable (ft)

Hence,

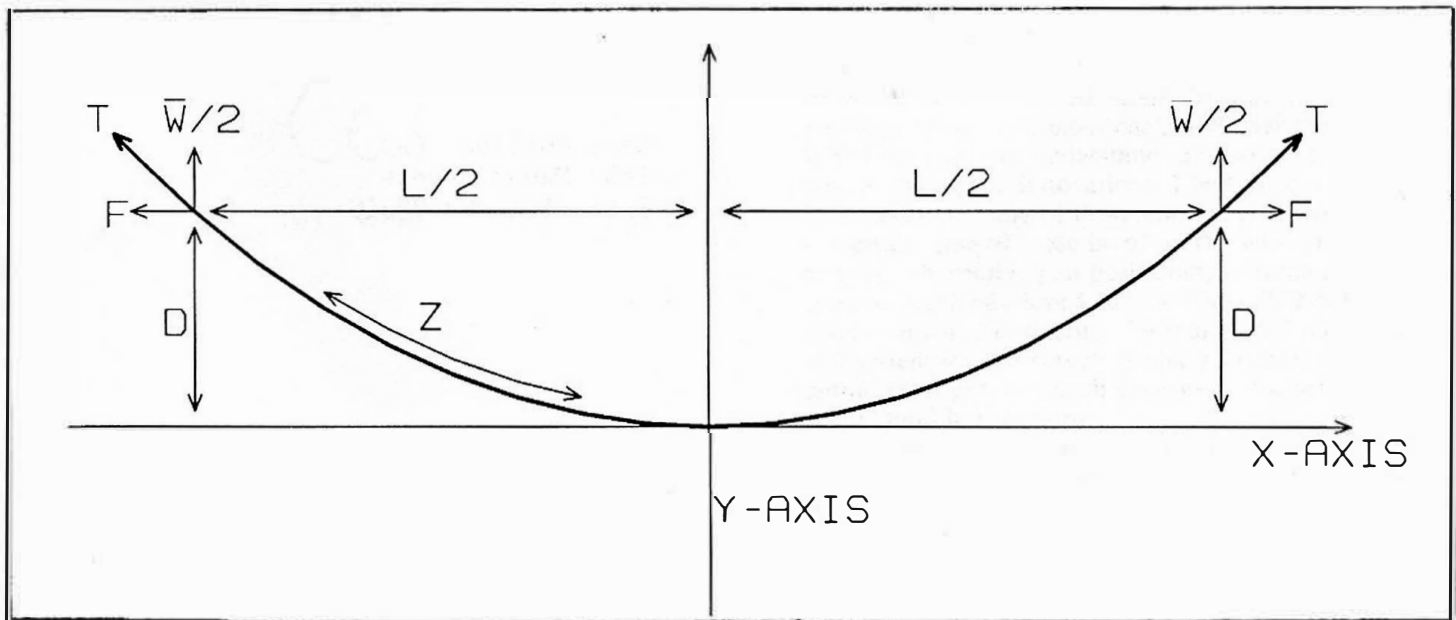
$$D = f(x = L/2) = \frac{F}{W} \left(\cosh \left(\frac{WL}{2F} \right) - 1 \right) \quad (3)$$

You can measure D , L and W , so (3) can then be used to solve for F :

$$T = \sqrt{F^2 + \left(\frac{\bar{W}}{2} \right)^2} \quad (4)$$

For a reasonably taut cable, $z \approx L$, so $\bar{W} \approx WL$, and so

$$T = \sqrt{F^2 + \left(\frac{WL}{2} \right)^2} \quad (5)$$



Trivia Question: What well-known architectural structure is based on the catenary curve?

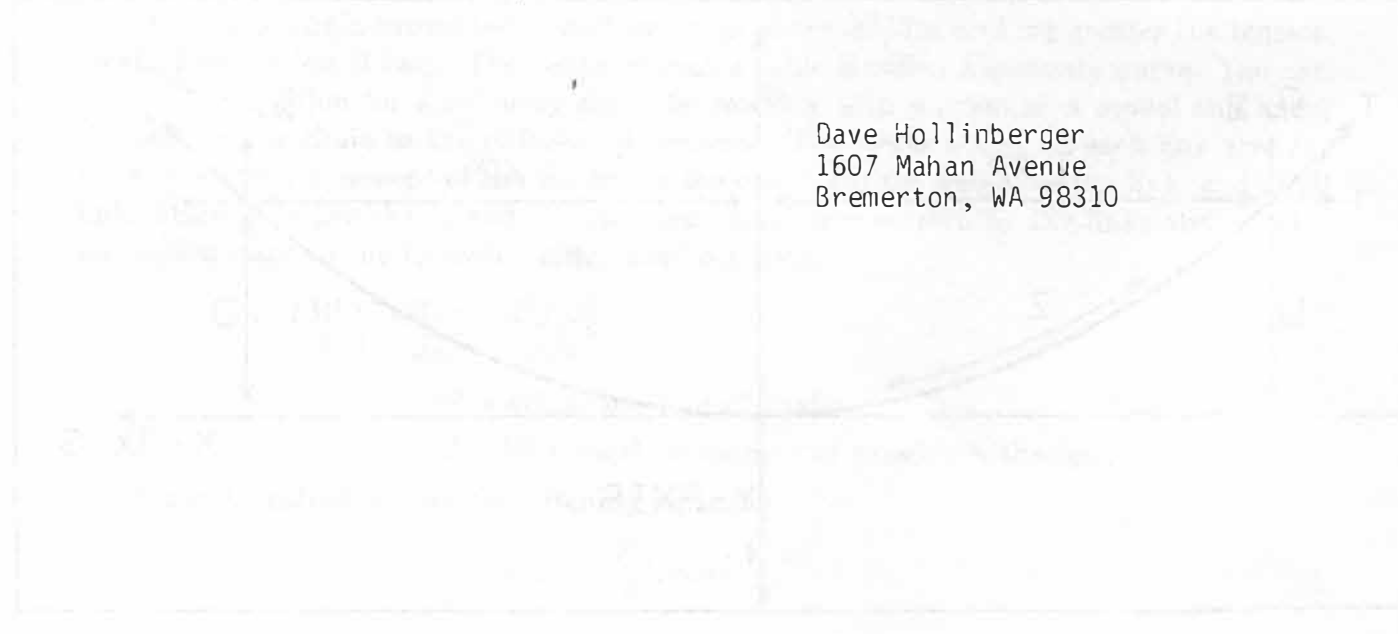
THIS QUARTER'S PUZZLE

PotPourri

This quarter's puzzle is a series of short puzzles:

1. A glass of iced tea, filled to the brim, is untouched until the ice melts. What happens to the level of the iced tea?
2. A mean solar day is 24 hours long. A sidereal day is 4 minutes shorter. Why the difference?
3. A bird lives in an airtight cage which sits on a scale. How does the weight measured by the scale change when the bird is flying or resting?
4. You've just poured a cup of coffee, when the phone rings. Do you put your cream and sugar in now, or wait until you've finished the phone call?
5. You've been kidnapped and placed in solitary confinement. You have the following possessions: keys, pen, pencil, change, watch, belt, shoes, clothes, tie, notebook. Your cell has a bed, sink, table, mirror and toilet. Your captors feed you three meals a day and permit you to go outside for exercise once a day. How do you find out where you are?
6. Balloons and submarines sometimes trail a length of chain for precise altitude control. How does this work?

Answer to Trivia Question: The Gateway Arch in St. Louis, MO is in the shape of an inverted catenary curve.



Dave Hollinberger
1607 Mahan Avenue
Bremerton, WA 98310

CORRESPONDENCE

Arthur S. Westneat
P.O. Box 208
Durham, N.H. 03824
603-659-2195

February 20, 1985

Mr. Harold A. Sabbagh, Editor
IEEE Oceanic Engineering Society Newsletter
Bloomington, IN

Dear Hal,

As you know, we have a fledgling OES technical committee on the subject of Artificial Intelligence, as it relates to Oceanic Engineering. I have had a hard time getting something started here since it has had minimal contract support, and scarcely anyone is working in the field.

I have shared in organizing an occasional Conference at UNH in this field, which has been relatively well attended and is full of creative new technology. One is coming up in six weeks, too late to be properly announced in the Newsletter. The fact that it exists is important, however, and the focus of its program is very pertinent to the purposes of the Society. The fact that Admiral Mooney will speak at the Classified Session is certainly encouraging to me.

Would you care to use some of this material in your Newsletter to encourage attention to the topic of intelligent systems in Ocean Engineering?

You might also care to note that a rather comprehensive article on this subject appeared in SPECTRUM an issue ago. I played a role in getting this published, and it certainly reflected well on OES.

Thank you for your help. I certainly hope that we may talk in Houston next month.

With kindest regards,



Art Westneat

Dear Mr. Sabbagh:

Thanks very much for publishing my paper on "Cooperation, For Technological Progress, Between Private Industry and the Government's National Laboratories." I believe that when the present boom in defense industries tapers off, technology transfer will be the salvation of many high-tech industrial firms, and of many in the electronics engineering profession. By republishing this paper you will be doing a very good turn to many of our fellow members of the IEEE.

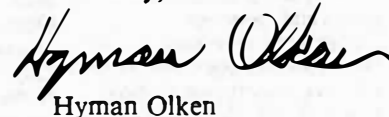
I was delighted with Mr. Mason's article on the historical development of Sonobuoys. During the years of World War II I was also employed, as an engineer, in technology development for the Navy. I worked in the Engineering Design Department of the U.S. Naval Gun Factory, which was located in the Navy Yard at Anacostia, just outside Washington, D.C., next door to the Naval Research Laboratory.

The Naval Gun Factory had the responsibility for design and development of all naval ordnance. I was employed in the section of the Engineering Design Department that did the development of automatic control systems for making the turrets and all the individual guns on a cruiser or battleship follow the gun director (fire control section). This was exciting work because the Navy was then developing the automatic gun control systems for the new cruisers and battleships being built to replace those lost at Pearl Harbor.

Much of what Mr. Mason says of the hectic early days of World War II applied equally well at the Naval Gun Factory. There were moss backs left over from World War I who did not understand, and so opposed, many new technological innovations. I had the good fortune to be engaged in some of these internal professional controversies. One of these involved the selection of the test of those alternative gun positioning automatic control systems being developed for the Navy. The other was discovering and correcting the fault in the automatic control system for the Navy's primary weapon — the 5-inch anti-aircraft gun — which once went "berserk" while on a test stand in the shops.

I would give you a good account of both these episodes if you would want to use them in the Oceanic Engineering Society Newsletter.

Sincerely,



Hyman Olken

Oceans 85

TENTH ANNIVERSARY JOINT MTS/IEEE
CONFERENCE AND EXPOSITION

NOVEMBER 12 — 14, 1985

TOWN & COUNTRY
CONVENTION CENTER

SAN DIEGO, CALIFORNIA



TECHNICAL PAPERS DISPLAYS AND TUTORIALS WILL COVER THESE AREAS:

Ocean Science

Biology
Fisheries
Oceanography
Ocean physics
Geology and geophysics
Geodesy
Remote sensing
Pollution
Ocean energy
Meteorology
Coastal processes

Marine Resource Management

Education and training
Policy and law of the sea
International issues
Economic potential
Economic issues
Marine recreation
Oil and mineral resources
Coastal zone management
Food and drug resources
Water quality
Ocean monitoring

Ocean Engineering

Materials technology
Viewing and photography
Buoys and moorings
Cables and connectors
Diving and salvage
Offshore structures and ships
Oceanographic instrumentation
Undersea vehicles
Power systems
Sea floor engineering

Polar Research

Through ice geology
Under ice geodesy
Ice station engineering
Under ice operations
Sea floor engineering
Information exchange
Resource management
Other polar related topics

Marine Information Systems

Communications
Acoustic analysis
Telemetry techniques
Data base management
Data processing
Navigation
Data acquisition
Artificial intelligence
Information systems
Air/sea interface data

Emerging Ocean Technologies

Basic research
Ocean related research
Technology advancement
Program development
International activities
Ocean investigation
Operational capabilities
Engineering developments
Systems technology
Advanced development
Other ocean related topics

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	YALE CORDAGE, INC.

EXHIBITS

An extensive exhibit of marine products and services is planned as part of the OCEANS '85 conference and exposition. Special events have been scheduled at the exhibit hall to encourage interaction of exhibitors and attendees. San Diego has more than 100 ocean oriented industries, research and military centers.

For information call or write:

OCEANS '85 Exhibits Chairman
P.O. Box 6830
San Diego, CA 92106 U.S.A
Frank Simpson (619) 569-3541

SPECIAL EVENTS

(Details will be provided in the Advance Program)

- Tutorials (Monday, Nov. 11)
- Welcoming Cocktail Party (Monday, Nov. 11)
- Keynote Luncheon (Tuesday, Nov. 12) Dr. Erich Bloch, Director of National Science Foundation
- Exhibitor Cocktail Party (Tuesday, Nov. 12)
- Special Evening Extravaganza at Sea World (Wednesday, Nov. 13)
- MTS/IEEE Awards Luncheon (Thursday, Nov. 14)
- Film Festival Competition — Show of Winners
- Tour of UCSD's Scripps Institution of Oceanography and Hubbs-Sea World Research Facilities
- Tours of other San Diego Industrial and Research Centers for the Marine Industry
- Special Tours of La Jolla, San Diego and Tijuana, Mexico
- Special Post Convention Package to Hawaii

. . . and home of more than 100 ocean-oriented companies, Navy ships, the Naval Ocean Systems Center, and Scripps Institution of Oceanography, will be the site for the Oceans '85 Conference from November 12-14, 1985.

Oceans '85 will be the tenth international joint meeting of the Oceanic Engineering Society of the Institute for Electrical and Electronics Engineers (IEEE), and the Marine Technology Society (MTS).

More than 1,200 persons are expected to attend the meeting, which will stress maritime needs and common interests important to the international body of attendees and solutions that marine technology may provide.

Early response to the call for papers indicates nearly 300 topics in 80 categories will be presented by scientists and engineers from nearly 20 countries. There will be nine concurrent sessions, several workshops, panels, tutorials, and a plenary theme session.

TOURS AND ATTRACTIONS

San Diego has been known for many years as America's Finest City, and with good reason. There is near perfect weather and sunshine. Watersports abound in both the bay and the harbor, and vary from jet-skiing to sailboating. La Jolla has the internationally renowned Underwater Park for snorkeling and scuba diving.

For land loving sports enthusiasts, there are about 90 golf courses and over 1,000 tennis courts, plus interesting walking tours.

Special hospitality programs have been planned to explore the city and harbor, and also La Jolla. There will be a fascinating trip behind the scenes at the Zoo where you will be given a private look into some of the enclosures and the food preparation areas. If you haven't been to Tijuana in a couple of years, you won't recognize the new city. Its import stores, like Ralph Lauren and Fila, are mixed in with the traditional Mexican handicraft bazaars — a perfect opportunity to do your holiday shopping.

A special evening is planned at San Diego's famous aquatic park, Sea World, where you will enjoy dinner, entertainment and visiting the Penguins in their natural environment. And, for those wishing to extend their trip, a post convention in Hawaii will be offered at very special convention rates.

Oceans '85 will be headquartered at the Town & Country Hotel in Mission Valley. This is one of the major hubs in the city and is in close proximity to the attractions, with easy freeway access. For those who like the night life, there are 35 nightclubs near the hotel.

- DR. WILLIAM NIERENBERG Director, Scripps, UCSD
- DR. CURTIS CROOKE Global Marine Development Co.
- MICHAEL L. FISCHER Executive Director, California Coastal Commission
- DR. ROBERT FROSCHE Vice President, GM Research Laboratories
- ADM. JAMES GRACEY, USCG Commandant, USCG
- ROBERT M. HILLYER Technical Director, NOSC
- DR. ANTON Inderbitzen Director, Polar Programs, NSF
- DR. JOHN KNAUSS Vice President, Marine Programs, URI
- J.E. LANGILLE III Deputy Director, Scripps, UCSD
- RADM JOHN B. MOONEY, USN Chief of Naval Research
- DR. JOHN PENHUNE Vice President, Science Applications Inc.
- COMO JOHN R. SEESHOLTZ, USN Oceanographer of the Navy
- DR. DEREK SPENCER Associate Director, WHOI
- DR. FRED SPIESS Director, Institute of Marine Resources, UCSD
- DR. JAMES WINCHESTER Associate Administrator, NOAA
- DR. JAMES ZUMBERGE President, USC

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Hotel Reservations

Oceans '85 has reserved a block of rooms at the Town & Country Hotel at special rates.

Standard	\$55 (single)	\$65 (double)
Superior	\$65 (single)	\$75 (double)
Deluxe	\$80 (single)	\$90 (double)

Note: Cut-off date for these rates is October 21, 1985. Make your reservations directly with the hotel. Call direct (USA) 1-800-854-2608; (Calif.) 1-800-542-6082; (International) 619-291-7131. Mention that you will be attending the Oceans '85 Convention.

Students

Special accommodations will be available in host homes for students. Contact Oskar Kirsten (619) 452-2598.

Airline Reservations

American Airlines is the official airline for Oceans '85. American Airlines will guarantee discounts.

Call these special toll free numbers for more information and ticketing. Ask for Star File S-7699.

- 1-800-433-1790 (except Texas)
- 1-800-792-1160 (in Texas)

Automobile Reservations

Oceans '85 has arranged special rates with Dollar Rent A Car. These include economy cars at \$22 per day, compacts at \$25 per day, intermediates at \$28 per day and standard sized cars at \$30 per day.

OCEANS '85 ADVANCE REGISTRATION FORM

Please PRINT as you want shown on badge

Name (first or initials) _____ Last _____

Company/Organization _____

Position _____ Telephone (include area code) _____

Address Bus. or Home _____ Dept. or M/S. _____

City, State, Postal Code/Country _____

Spouse to attend (no fee required) Name _____
(Additional Luncheon Tickets Required)

REGISTRATION FEES

PACKAGE

(Includes three day conference, proceedings, luncheon tickets for Tuesday, Thursday and Sea World)

	AT DOOR	ADVANCE
Society Member	\$175	_____ \$145
Non-Society Member	\$220	_____ \$190

REGULAR

(Includes conference and proceedings)

	AT DOOR	ADVANCE
Society Member	\$135	_____ \$105
Non-Society Member	\$180	_____ \$150

SPECIAL RATES

1-day rate _____ \$50 ea
Specify day/days Tue. Wed. Thur.

ADDITIONAL TICKETS

- Luncheon tickets _____ \$20 ea
Specify days Tue. Thur.
- Sea World Tickets _____ \$40 ea
- Conference Proceedings _____ \$50
- Mailing USA _____ \$ 5
- OVERSEAS _____ \$15
- GRAND TOTAL _____

Make checks payable to: **OCEAN '85 CONFERENCE** (in U.S. dollars)
P.O. Box 6830
San Diego, CA 92106 U.S.A.

**Member registration represents the following:*

- Acoustic Society of America • American Geophysical Union • IEEE
- Marine Technology Society • National Sea Grant Foundation
- National Advisory Committee on Oceans and Atmosphere



CALL FOR ENTRIES

OCEANS '85 FILM FESTIVAL

**Conference & Exposition
November 12-14, 1985**

**Town & Country Convention Center
San Diego, California**

We are looking for Films & Video Tapes of Short
Length 16mm Film, 3/4 & 1/2 VHS
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Subject

OCEAN ENGINEERING & THE ENVIRONMENT

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For Information Contact:

Phil Rapp, Film Festival Chairman
Marine Physical Laboratory
Bldg. 106, NOSC Bayside
San Diego, CA 92152
Phone: (619)294-3656

ANNOUNCEMENTS AND CALL FOR PAPERS

SPECIAL ISSUE ON BEAMFORMING

Reprinted from IEEE Journal of Oceanic Engineering

Vol. 10, No. 3 1985 July

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Sonar Cross-Sections of Bodies Partially Insonified by Finite Sound Beams	Guillermo C. Gaunaud
A New Approach to the Design of Broad-Band Elements Space Antenna Array Processors	Meng H. Er and Antonio Cantoni
Adaptive Frequency Domain Beamforming and Spectral Analysis Using Small Sparse Arrays	Carl M. Bennett
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Beamforming on Bottom-Interacting Tow Ship Noise	William A. Kuperman, Michael F. Werby, Kenneth E. Gilbert and Gerard J. Tango

Application of Beamforming Techniques to Measurements of Acoustic Scattering from the Ocean Bottom Jonathan M. Berkson, H. J. Kloosterman, T. Akal and J. L. Berrou

Papers

Asymptotic Detection Performance of Discrete Power and Higher-Order Spectra Estimates Roger F. Dwyer

An Acoustic Positioning System Using Demodulated Signals of an FM Ultrasonic Wave Hideto Mitome, Toshio Koda and Shuji Shibata

Model JDC1-1 Precision Conductivity Ratio Measurement System Luo Jiuru

Book Review

The Times Atlas of the Oceans, Edited by Alastair D. Couper Reviewed by William M. Carey

Announcements

First National Conference in Dock and Harbour Engineering, 1985 December 27-29 at Bombay, India

Third IEEE Working Conference on Current Measurements, 1986 January 20-22 at Washington, D.C. — Call for Papers

1986 Offshore Technology Conference (OTC), 1986 May 5-8 at Houston, TX — Call for Papers

Symposium on Underwater Acoustics, 1986 July 16-18 at Halifax, NS — Call for Papers

CALL FOR PAPERS

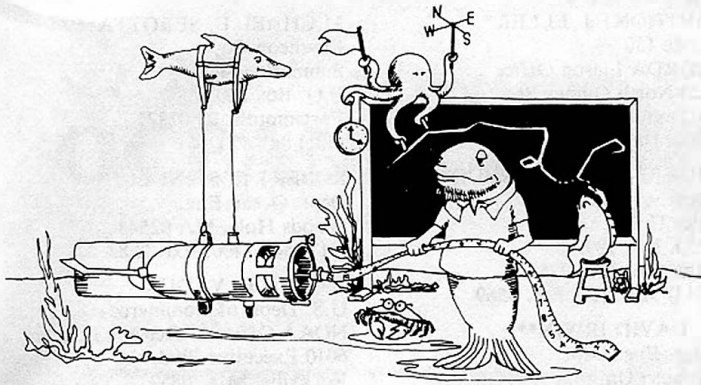
International Conference on Systems, Man and Cybernetics 1985, November 12-15, Holiday Inn-Broadway, 180 W. Broadway, Tucson, AZ 85701. Sponsor: IEEE Systems, Man and Cybernetics. Contact Russ Ferrell, Systems and Industrial Engineering Dept., University of Arizona, Tucson, Arizona 85721; (602)621-6551. Papers are invited covering human-machine interaction, large scale systems, behavioral decision making, manufacturing systems, pattern recognition, human computer interaction, expert systems, robotics, biomedical engineering and other related topics at the forefront of technology. Authors submitting papers should forward 3 copies of a one-page abstract to the Technical Program Chairman: A. Terry Bahill, Systems and Industrial Engineering Dept., University of Arizona, Tucson, Arizona 85721 by April 15. Completed papers due June 15.

Fourth International Symposium on UNMANNED UNTETHERED SUBMERSIBLE TECHNOLOGY

June 24-27, 1985
New England Center
Durham, New Hampshire

This symposium is focused directly on the programs and technologies in the field of unmanned untethered submersible systems. The symposium is meant to provide background and insight relating to this developing technology. The emphasis of the symposium is to stimulate informal interaction among the participants.

Sponsored by:
Marine Systems Engineering Laboratory
University of New Hampshire
Durham, New Hampshire 03824
603-749-6056



CURRENT MEASUREMENT TECHNOLOGY COMMITTEE NEWS AND INFORMATION

A primary objective of the Current Measurement Technology Committee (CMTC) of the Oceanic Engineering Society (OES) is to provide a focus for information exchange and promote cooperation and coordination among those in the marine community involved in current measurement. To this end, this column has been established as a regular feature of the *OES Newsletter* and everyone is encouraged to participate by submitting news items and information about active or planned current measurement efforts to Bill Woodward (301) 443-8444 or Jerry Appell (301) 443-8026 for publication in the column. This will be an effective forum only if everybody participates, so let's hear from you.

Our column in the previous newsletter issue described an ambitious field survey program at the Institute of Ocean Sciences in British Columbia. The individual's name to contact for further information was inadvertently omitted. It should have read: For further information contact M. J. Woodward (604) 656-8342.

The Bedford Institute of Oceanography has experienced large calibration drifts in the conductivity cell reading from the Aanderaa RCM. Laboratory tests of twenty cells soaked in sea water for sixty-six days gave an average drift of -0.32 ± 0.08 PPT. The drift occurs on cells with serial numbers over 5050 which are not equipped with the quartz liner. Aanderaa instruments is now redesigning the cell with quartz liners to cure the drift problem.

Second, we have experienced rotor count drop-out (rate reading zero) over large periods of time on the Aanderaa RCM. This problem has been traced to faulty rotor follower magnet bearings which have become contaminated with resin particles or glue during the manufacture of the assembly.

For more information, contact A. J. Hartling at (902) 426-6102.

The U.S. Naval Air Development Center has installed an AMETEK-Straza DCP 4400/300 Acoustic Doppler Profiler in a "piggyback" fashion aboard the U.S. Navy's HESS, a survey ship operated for the U.S. Naval Oceanographic Office. The profiler operates by piggybacking on the ship's existing acoustic speed log system in

the same manner as the system aboard the EXXON Tanker JAMESTOWN (see CMTC column in summer 1984 *OES Newsletter*). A shakedown cruise has taken place and the data is being analyzed.

For further information contact Tony Marino (215) 441-1743.

Bill Terry of the Woods Hole Oceanographic Institution has volunteered to take the lead in establishing a CMTC subcommittee to explore the issue of standards and their applicability to technology for measuring currents. As a first step Bill, is gathering information on what facilities exist for the testing and evaluation of current measurement devices. He is interested in information on physical dimensions, speed range, oscillation capability, outside user availability, cost, etc.

If you have any facilities or knowledge of them, please contact Bill Terry on (617) 548-1400 extension 2427.

Announcements and Calls for Papers

continued from page 18

CALL FOR LECTURERS

Members are invited to apply for the 1985 Distinguished Lecture Tour of Region 9, which will take place during the fourth quarter of this year. The group will be composed of lecturers in the following fields:

(a) Power: new developments in power system protection; power transmission (new developments, EHV, DC transmission, compact transmission lines); power distribution (new developments, underground systems); (b) Computer: computer networks; microprocessor applications (control, industrial applications); robotics; (c) Communications: digital communications (public networks, packet switching, satellite communications, integrated networks); fibre optics; local area networks.

The approximately two-week tour will include visits to cities in Region 9 in some or all of the following countries: Argentina, Brazil, Chile, Colombia and Peru.

Funding for the trip is the responsibility of the individual lecturer. The deadline for application is AUGUST 15, 1985.

Prospective tour participants should send letters indicating their interest in the tour, accompanied by a resume and a one-page summary of their proposed technical lecture, to their respective Society or Council president. A copy should also be sent to Dr. Matthew Kuhn, Chairman, IEEE Transnational Relation Committee, c/o Ms. Barbara Ettinger, TRC Administrator, IEEE Headquarters, 345 E. 47th St., New York, NY 10017.

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