The President Looks Ahead

Dr. McCulloch

For twenty-five years, the informational revolution in science and engineering has taken diverse forms, often linking disparate disciplines by notions of computation, control and command that constitute cybernetics. Our society was founded to bring together those groups who are concerned with these problems and who share the requisite varieties of seminal ideas from which our future ventures may selectively evolve.

For this we need a common language that has been developing in interdisciplinary teams, meetings and publications, and which must become comprehensive enough for our disciplines of analyzing, of synthesizing and of compiling systems, constituted of organisms and machines. The success of our first scientific meeting, in Washington, to diversify in speakers and to well attended, would have been impossible a few years ago.

The program of the opening meeting of the Chicago chapter, on January 17th bids fair to follow suit. This is due partly to the success of applications of cybernetics to the solution of problems in the entrenched disciplines of science and engineering, partly to the increased use, understanding and invention of the appropriate logic and mathematics, which is a development of the logic of triadic relations and the theory of coupled nonlinear oscillations.

The mentalism which still cries "No machine can think!" will seem to our children as dead as the vitalism of our fathers which said "No machine can live!" — provided cybernetics becomes their common language. To promote this, and to keep pace with the explosion of our thoughts, we have started this newsletter. Please give it and us the support of your new significant ideas, branches or achievements.

Dr. Warren McCulloch

ASC's First Annual Symposium
Is a Resounding Success

Gaithersburg, Md. — The possibilities of designing computers to perform creative tasks was one of the subjects of a two-day American Society for Cybernetics (ASC) symposium held at the National Bureau of Standards Auditorium in Gaithersburg October 26-27, 1967. Although computers will never replace man, scientists hope one day to be able to build and program them to solve problems when the procedures to develop the answers aren't already stored in the computer's memory.

Computers that can do this are called "purposive systems". Today's most perfect purposive system is man. Tomorrow, perhaps, it will also be a computer — a computer designed to help man solve technical, scientific and social problems that because of their complexity were previously unsolvable.

Cybernetics experts from Western Europe, the Middle East and from behind the iron curtain presented papers at the ASC meeting — the theme of which was "Purposive Systems: The Edge of Knowledge." The program was the first annual symposium of the American Society for Cybernetics and was sponsored by the National Science Foundation.

International speakers on the program included Dr. Y. Bar-Hillel, Hebrew University, Israel; Herbert Anschutz, Ministry of Defense, Germany; and Dr. Nicholai M. Amosov, Head, Biological Cybernetics Department. Institute of Cybernetics, Kiev, Ukrainian S.S.R.

Keynote speaker for the conference was Dr. Frederick Seitz, President of the National Academy of Science. His topic was "The Challenge".

The two-day cybernetics conference was presented in four sessions. The first — "Man as a Purposive System" was chaired by Dr. Warren McCulloch of M.I.T. who is also President of the American Society for Cybernetics. "Purposive" has been defined as the ability to seek goals. Man is a perfect goal-seeking system. He seeks a job or a change in jobs. He seeks a mate, an education, or various methods of relaxation.

Machines are not yet developed into successful goal-seeking (or purposive) systems and the second ASC session covered problems surrounding that subject under the chairmanship of Dr. Carl Hammer, Director of Scientific Marketing, UNIVAC.

The third session covered "Men and Machines Together as Purposive Systems" and was chaired by Dr. Heinz von Foerster of the University of Illinois.

The fourth and final session was an open forum discussion between the symposium speakers and attendees. Speakers included Dr. Ralph Gerard, Dean of the Graduate School, University of California; Dr. Alexander Frazer, University of Cincinnati; Dr. Emmanuel Mesthene of Harvard; J. A. Haddad, Corporate V. P. for P. & D, IBM; Dr. Saul Amarel, RCA, Princeton Laboratories; Dr. Seymour Papert, M.I.T.; Dr. Ivan Sutherland, Harvard; Dr. J. C. R. Licklider, IBM; and Dr. David Hawkins of the University of Colorado.

Special presentations were made by Dr. Talcott Parsons, (Harvard), President, American Academy of Arts and Sciences, and Dr. Margaret Mead of New York Museum of Natural History.

Dr. Parsons' talk covered "Facilitating Technological Innovation in Society". Dr. Margaret Mead, well known anthropologist and co-editor of the proceedings of the first meetings on cybernetics held at Princeton in the early 1950's (under the sponsorship of the Josiah Macy Fund).

Continued on Page 2
Will Machines Enslave Man?

by Dr. Anatoly Dorodnitsin

Man - machine relationship, the natural by-product of rapid technological progress, has some curious sides.

Only the silent electronic computers seem gungovernable, and therefore frightening; other machines from diverse branches of engineering will obey man, and, what is more, will never be able to start working without man.

So far computers are in their infancy. All they do is calculate and perform operations of elementary logic — and only as man tells them. But some people already visualize assignment of all kinds of mental work to computers. Everyone agrees now that they can do mental work. What is more, 'feelings' can be imputed to computers.

Primary feelings are the physical senses. A computer fitted with all kinds of devices to act as sensory organs can perceive and assess environmental situations. Technically, creation of a perceptor-machine is no longer a problem.

Many mathematicians and cybernetics scientists are working on image identification by machine. The machine accurately portrays the images it perceives. Some computers can read printed texts and grasp sounds. Perceived and decoded, the images can be developed into stimulants of machine emotions. Depending on the nature of perception and assessment the computer can act one way or another.

Intriguing efforts are being made to simulate the process of creation. Machines can compose melodies, ranging from primitive to quite fair. It seems that if the machine could be lent inspiration, it would create good music.

A scientist looks for ways to solve problems that interest him. He gathers information for months, or even years, until he hits on the procedures required. His joy at times may border on ecstasy. Long-stored information reaches fullness and fruition. Storage of information, experience, aims, and desire can be programmed into a machine.

Future computers, of course, will have little resemblance to those of today; the difference will be greater than the difference between the abacus and the most modern computer now available.

Man or Robot Victorious?

While man creates automatic thinking machines that will be his helpers, he could, in principle, also create machines that would be his enemies. Hence

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The Chicago Chapter of The American Society for Cybernetics gets under way with its first symposium on Wednesday, January 16, 1968, sponsored by the Chicago Academy of Sciences, 2001 North Clark Street. A membership drive will be held in conjunction with the symposium.

The program will be as follows:

- Dr. Jerald S. Brodsky, Asst. Professor, Biomedical Engineering and Dr. William B. O'Neill, Asst. Professor, Systems Engineering, University of Illinois Medical School, "BLACK AND GRAY BOX EXPERIMENTS ON THE ACCOMMODATIVE AND ACCOMMODATIVE CONVERGENCE SYSTEMS";
- Dr. Albert Wolfson, Professor, Dept. of Biological Sciences, Northwestern University, "DAILY TIME MEASUREMENT AS A REGULATOR OF ANNUAL BREEDING CYCLES AND MIGRATION OF BIRDS";
- Dr. Earl Gose, Assoc. Professor, Dept. of Information Engineering, University of Illinois, "PATTERN RECOGNITION BY ANIMALS WITH MACHINES";
- Dr. Peter Greene, Assoc. Professor, Committee for Mathematical Biology and Committee on Information Sciences University of Chicago, "MOTOR CONTROL IN BRAIN AND ROBOT: SOME MATHEMATICS AND SOME SOVIET EXPERIMENTS".

The afternoon session will include:

- Dr. Gilbert K. Krueke, Professor Industrial Engineering and Management, Northwestern University, "HOW PEOPLE PROCESS LANGUAGE";
- Dr. Roger C. Conant, Biological Computer Laboratory, Department of Electrical Engineering, University of Illinois; "INFORMATION TRANSFER IN COMPLEX REGULATORY SYSTEMS";
- Dr. Jack D. Cowan, Chairman, Committee of Mathematical Biology, University of Chicago, "STATISTICAL MECHANICS OF NEURAL NETWORKS";
- Dr. Warren McCulloch, President of the American Society for Cybernetics will close the symposium.

Attendance at the symposium is open to all interested individuals. No admission will be charged. For further information, contact: G.T. Jacob, IIT Research Institute, 10 West 35th Street, Chicago, Illinois 60616: 312/225-9630 X 4002.

As Mr. Webb expressed his concerns about the secondary and tertiary effects of the space program, the listener would conclude that the approach to the management of complex, man-machine-social systems which he was calling for would be more revolutionary and far-reaching than the vast and impressive technical accomplishments of NASA. Generalization of such a spin-off from the space program might provide insights into the mechanisms by which societies evolve in adapting to radically new changes in their environment. Thus the experience of NASA could contribute to the US capabilities not only for the space race but also for that larger contest hinging on the abilities of contestants to manage their increasingly complex social systems.

Mr. Webb's address therefore was more than a fascinating first-hand account of the Governmental administrators' role in today's world; it was also a challenge for the ASC to aid in the formulation of an appropriate adaptive approach to tomorrow's management problems.

L. J. Fogel
Vice-President, A. S. C., President, Decision Science Inc.

ASC Newsletter
AROUND THE MEETING HALL...

Dr. Frederick Seitz President of the National Academy of Sciences and opening speaker of the symposium ponders "as to the genesis of a particular canister of spirits presented to him as he prepared to address the audience. Dr. Heinz Von Foerster, Chairman of the ASC Board, (right) seems to be wondering, too, as T. C. Helvey looks on.

Not a lecture in aeronautics -- rather, an E² (energetic, erudite and entertaining) presentation by Seymour Papert of M.I.T. on "Why Machines Can't Think!"

Three Honorary Founders of the society and members of the Scientific Council meet like old friends, ASC President, Warren S. McCulloch, M.D., (left); Dr. Gregory Bateson, (center), and Dr. Frank Fremont-Smith.

The chores of Presidency. Dr. McCulloch personally and patiently signs "in original" the membership cards of each of the current members of the society. Surely a memento that will become a collector's item immediately on issuance (around the first of the year).


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Form 3570 Requested