NARST Newsletter

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President's Column

The Fifty-fifth Annual Meeting of the National Association for Research in Science Teaching will be held April 5-8, 1982 at The Abbey on Lake Geneva. This is a resort setting near Chicago and will provide facilities similar to those we had for last year's annual meeting.

Several features that were well received by people attending the meeting last year will be continued this year. Examples include poster sessions, our "hour-with" sessions and informal sessions. We believe the program will provide an excellent range of research topics.

Because we will again be meeting in a self-contained setting, there will be excellent opportunities for NARST members to get to meet one another in informal as well as in formal circumstances. We strongly encourage you to take advantage of the setting to make new friends among your professional colleagues. While our meals will not be served under the same conditions as last year, we will all be in a single dining room and we will constitute by far the majority of people at The Abbey. Sharing a meal with new friends will afford an ideal situation to explore common interests and endeavors. We invite you to make the most of the opportunity.

Stanley L. Helgeson,

Free Register-Directories of NARST Members to Respondents

Our paper file on NARST members describing their experiences, publications and interests continues to grow in size. Our computer file program is commencing this month. Be sure to complete the Register information form on the reverse side of your 1982 dues invoice. Information reaching the Association headquarters by February 20, 1982, will be compiled and distributed at The Abbey (April 5-8) for the price of $5.00 or will be mailed for the price of $7.00. Members submitting this information will receive FREE copies of the entire register at the annual meeting or by mail. So complete the register form today. Be included. We need to know each other better.

President-Elect's Column

The 1981-82 program committee for NARST met in Chicago and was pleased with the number and variety of papers submitted. Over 120 papers were presented for possible inclusion in the 1982 annual NARST convention. The papers were rated blind and the rejection rate amounted to 20%. In this respect, the committee would like to encourage people in the future to submit only proposals describing completed research studies. The committee was pleased to note that a wide variety of presentations and discussions were scheduled for the 1982 meeting at The Abbey on Lake Geneva near Chicago. The committee believes that we have a viable and interesting program and look forward to submitting a preliminary program for the membership to review in a future newsletter.

Carl F. Berger

New Feature in the Newsletter

From time to time people will be asked to comment in the newsletter on issues and developments of general interest to the membership. Your suggestions are always appreciated.

NARST Helps NSTA Select Papers

The executive secretary of NARST will head a subcommittee charged with the responsibility of selecting the NSTA contributed papers (in all cate-

gories) to be presented at the 1983 NSTA (National Science Teachers Association) national convention meeting in Dallas, according to Professor Robert Beck Clark, Co-Chairperson of the Dallas program committee. This NSTA subcommittee will evaluate submitted abstracts in a discriminating fashion. Of course, NSTA goals and objectives will be used as a basis to select papers. Nevertheless, NARST members are encouraged to write the Calgary headquarters describing their views regarding the art of selecting contributed papers for NSTA. Specific suggestions will be seriously considered. Once again, NARST is pleased to assume this leadership position in science education.

Profile: Science, Mathematics and Environmental Education at Cornell University

The origins of Cornell University's efforts go back to the 1890's when Dean Bailey and Anna Botsford Comstock initiated programs in nature study to improve instruction in elementary school science. The work in nature study and teacher education was continued by E. Lawrence Palmer and later by Richard Fischer. Philip Johnson, the first resident of the National Science Teachers association, succeeded Palmer as Chairman of the Science Education group, and Johnson was succeeded by Joseph D. Novak in 1967.

Over the decades, the emphasis has shifted from nature study and teacher education to greater emphasis on curriculum development, research in science education and development of educational theory. Environmental education continues to be an important focus for much of their work. On the other hand, teacher education has been reduced to cooperative programs with nearby colleges. In 1979, the Cornell group combined programs in mathematics education with those in science and environmental education.

Work in elementary science has continued through authorship of elementary science programs by Novak and Rockcastle, with the latter program (STEM) now used by more than two million students. Professor Rockcastle conducts numerous workshops with elementary school teachers.

Current work in mathematics education centers on remedial courses for students in the College of Agriculture and Life Sciences, special courses in the Mathematics Department and service to mathematics teachers.

Professors included in the group and their principal interests are:

Richard B. Fischer - environmental education, focussing on methods of interpreting the biological environment as well as strategies for professional upgrading of environmental education programs, participation in civic programs for maintenance of the environment.

Harrison A. Geiselmann - innovative approaches for teaching remedial mathematics courses, service to math teachers' associations.

D. Bob Gowin - studies of the structure of knowledge, with special emphasis on the role of science laboratories and the improvement of laboratory teaching, theory development in education including publication (1981) of *Educating*, and training of college teachers and development of innovative training approaches.

David Henderson - research and publication in topology, study of math anxiety and cognitive difficulties students experience in learning mathematics, experimental courses for math students with emphasis and teaching/learning of mathematics.

Joseph D. Novak - research on cognitive learning in science, curriculum development in science and environmental education and development of strategies for curriculum design, theory development including (1977) *A Theory of Education* and application of educational theory to new research and teaching strategies including programs to help students "learn how to learn," extensive work with visiting professors to share research and teaching strategies.

George J. Posner - research on models of conceptual change (with K. Strike) and development of a theory of conceptual change toward a goal of developing a more effective theory of instruction.

Verne N. Rockcastle - curriculum development in elementary science, development of strategies for effective teacher workshops, and adult education programs in environmental education.

Kenneth A. Strike - development of models of conceptual change (with G. Posner). Application of recent work in political philosophy and law to various educational problems including student rights, equal educational opportunity and conflict resolution.

Dr. Joseph D. Novak announced the names of six visiting professors exploring a variety of research topics at Cornell University. These people are professors on sabbatical or study leave who have come to learn, first-hand, about Dr. Novak's research work and to study related research issues. These professors include:

Gaalen Erickson, University of British Columbia, Vancouver, British Columbia, Canada

Rosalyn Brown Hammond, Morgan State University, Baltimore, Maryland

Elizabeth Hegarty, University of New South Wales, Kensington, N.S.W., Australia

Judith Kinnear, Melbourne State College, Melbourne, Australia

Marjory Martin, Toorak State College, Victoria, Australia

Protima Roy, Drury College, Springfield, Missouri

Profile: Dr. Rodney Doran

Rodney L. Doran
Department of Instruction
State University of New York at Buffalo
Amherst, N.Y. 14260

Dr. Doran's research has focussed on the development and validation of instruments to assess the outcome of school science programs. Activities in the cognitive domain are typified by the *Cognitive Lab Ability Test* (CLAT) which was validated with a sample of New York state medical technologists and medical lab technologists. Research in the psychomotor area has included attempts to distinguish science students from non-science students of the high school level with perceptual and manual dexterity tests. A major activity focussing on assessing affective outcomes was the construction and validation of a *Self Concept in Science Scale* (SCSS). Dr. Doran has written a book which describes techniques for assessing school science programs in all three domains. It was published by the *National Science Teachers Association* in January, 1981.

A study was just completed characterizing students within 10 allied health programs as to their cognitive (CLAT), affective, and psychomotor traits. A "Follow-Up" study of the self-concepts in science of high school students is being conducted at a local high school.

Dr. Doran has been appointed associated coordinator for the U.S. Participation in the Second International Science Study. This is a follow up to the first IEA study conducted in the early 1970's. This current study will assess the status of science education across the world, examine ways in which science education has changed since the early 70's and identify factors which explain differential achievement in science. This second study will be carried out over the next four years with the data being collected in the spring of 1983.

Profile: Dr. Dorothy Gabel

Dr. Dorothy Gabel
Science Education
Indiana University
Bloomington, IN 47405

The focus of the research activities of Dorothy Gabel has been on examining strategies that teachers could use to improve the achievement of secondary science students. Four major studies have been conducted during the past eight years. The first examined the effect of using self-pacing and working with partners on learning rates in ISCS classrooms. This work was followed by two studies examining the use of molecular models and analogies on chemistry achievement.

Two years ago an aptitude by treatment interaction (ATI) investigation considered the effectiveness of four teaching strategies for solving chemistry problems and considered students of varying proportional reasoning ability, mathematics anxiety, and verbal-visual preference. This investigation was accompanied by an interview phase that examined difficulties chemistry students have in problem solving.

Currently, Dr. Gabel is engaged in a study of the difficulties students encounter in learning the mole concept. This work is an outgrowth of the analysis of the interview phase of the previous study, and is only one of many topics that need further examination. These studies have been field-oriented work

conducted on a biyearly basis and involving large samples of students located in a number of high schools and enduring over the entire school year. This frequency of observation allows sufficient time for analysis of the data, interpretation of the results and the planning of the next study segment without exhausting both the teachers involved and the investigator who reportedly has a full teaching load.

Candidates for NARST 1982 Election

Drs. Jack Renner, Tony Lawson and Jim Okey of the Election Committee announced the candidates for the 1982 NARST elections. Additional nominations may be presented by petition containing ten member names. Petitions must be received by the executive secretary by January 10, 1982. The Bylaws require that information about each candidate be published in this newsletter and ballots be published two months prior to the annual meeting. Official ballots will be mailed to members in February, 1982.

Candidates for the position of president-elect include Drs. Ann C. Howe and John J. Koran, Jr. In addition, the election committee announced four candidates for the two positions on the executive board (three-year term): Drs. Linda DeTure, Douglas A. Roberts, Emmett L. Wright, and Russell H. Yeany.

ANN C. HOWE, Ph.D., University of Texas at Austin, 1969. Present position: Professor of Science Education and Coordinator of Secondary Teacher Preparation Programs, Syracuse University.

Dr. Howe began her career as an organic chemist, took a decade off to raise a family, and returned to professional life first as a research associate in chemistry and later as an elementary science teacher at the Laboratory School of the University of Chicago. Since 1970 she has been a member of the faculty of Syracuse University where she teaches preservice and inservice courses in science education, conducts graduate seminars, and advises masters and doctoral students. She has directed several implementation and research projects in cooperation with the junior high school science teachers and administrators in Syracuse.

Her current professional interests include application of Piagetian theory to science teaching, sex-related differences in science achievement, and the relation of classroom variables to science achievement. She has published a number of articles on a range of topics, most notably on the application of Piagetian theory to problems in science education at the preschool, elementary, junior high, and senior high school levels. She and her students are regular contributors to the programs of the NARST and NSTA annual meetings. She is presently engaged in a study of correlates of science achievement for male and female black and white students in junior high school.

Dr. Howe has served NARST as a member of the Editorial Advisory Board of *JRST*, 1975-1979, member of the Executive Board 1978-1981, member and chair of the Publications Advisory Committee 1979-1981, member of the Program Committee for the 1981 Annual Meeting, and chair of the Local Arrangements Committee for the 1981 Meeting.

JOHN J. KORAN, JR., Ph.D., Stanford University, 1968. Present position: Professor and Chairman of Science Education, University of Florida and Curator of Education, Florida State Museum.

Dr. Koran holds degrees in biology and administration in addition to his doctorate in science education and has held N.S.F. fellowships in biology at the University of Colorado (1963), University of Mississippi (1964), and the Stanford Hopkins Marine Laboratory (1965). He served as an Assistant Professor of Science Education at the University of Texas (1968-70) and has been a Professor of Science Education at the University of Florida since 1973.

Psychological modeling, individual differences and learning science, and learning science in informal settings are Dr. Koran's current research interests. His research and professional involvement have produced 26 technical reports and pamphlets, 20 research studies, 25 theoretical articles and reviews of research, and 55 paper presentations both nationally and internationally. Koran has published in the major science education publications as well as other publications in education.

In 1973, Dr. Koran was named the Outstanding Young Science Educator, an award presented jointly by the AETS and NSTA and the Shell Oil Co. In 1975 he received the Annual Research Award of the ATE (Association of Teacher Educators) and the Patron's award of the NARST.

Professor Koran has served two terms on the Editorial Board of the *JRST*. In addition, he has

served the NARST by being a member of the Research Committee for two terms, a member of the Program Committee, and a member of the Patron's Award Committee.

CANDIDATES FOR THE EXECUTIVE BOARD

LINDA R. DeTURE, Ph.D., University of Florida, 1976. Present position: Adjunct Assistant Professor of Education and Human Development, Rollins College, Winter Park, Florida, since 1979.

Dr. DeTure holds a degree in microbiology and medical technology in addition to two degrees in science education. Her experience includes one year as a hospital technician, seven years of secondary school science teaching, and college teaching and research.

In 1970, Dr. DeTure was named the Outstanding Teacher for the State of Florida particularly for counseling students to do independent science research. She also received the 1979 Patron's Award given by the NARST for the outstanding paper presented at the 1978 Annual Meeting. In 1980 Dr. DeTure received the *JRST* award for the best paper published in 1979.

Professor DeTure has served on the Research Committee of the NARST as well as on the Patron's Committee for Funding. She has also been a frequent abstractor to the publication, *Investigations in Science Education.* Her publications have appeared in the major science education journals and she has made many presentations at national and regional meetings. Dr. DeTure has been a consultant in or presented workshops in Maryland, Missouri, Ohio, Florida, and Indiana.

DOUGLAS A. ROBERTS, Ed.D., Harvard University, 1965. Present position: Associate Professor, Department of Curriculum, The Ontario Institute for Studies in Education, and Graduate Department of Educational Theory, University of Toronto. Effective January, 1982: Professor and Head, Department of Curriculum and Instruction, Faculty of Education, The University of Calgary.

Dr. Roberts holds a degree in physics as well as two degrees in science education. His experience includes three summers as a technical writer, five years of secondary school science teaching in addition to university teaching experience at Harvard, Temple, and the Ontario Institute.

During the past three years Dr. Roberts has been at work on a research project on development and implementation of science curriculum materials for junior high use in which different curriculum emphases are examined as features of both materials development and in-service teacher education required for implementation. That research has led to several publications which are added to the additional published research Dr. Roberts has to his credit. He has published in the major science education journals in the United States and Canada, and was awarded a citation for outstanding contribution to university teaching in 1973 by the Ontario Federation of University Faculty Associations.

Professor Roberts has been a frequent participant on the program of the Annual Meeting of the NARST. His most recent appearance was as a principal speaker at the 1981 meeting. He is currently a member of the Policy Advisory Committee.

EMMETT L. WRIGHT, Ph.D., Pennsylvania State University, 1974. Present Position: Associate Professor, Department of Curriculum and Instruction. Director, Science Teaching Center, University of Maryland.

Dr. Wright holds degrees in biology and physical science in addition to his terminal degree in science education and ecology. His experience includes three summers as an engineering aid for the Kansas Highway Commission, five years of secondary school science and mathematics teaching, three years as director of education for a medical research foundation, in addition to teaching experience at Pittsburgh State University, Pennsylvania State University, and the University of Maryland. Dr. Wright served as a UNESCO Science Education Evaluation Consultant to the University of Qatar and the Qatar Ministry of Education, Fall 1980, and as a visiting research scholar at the University of Georgia, Spring 1981. He is currently Director of the Chesapeake Bay Environmental Education Project.

Many organizations, including the NSF, have funded Dr. Wright's research and developmental activities in problem solving, environmental attitudes and simulation/gaming strategies. Those activities have resulted in presentations at many regional and national meetings and numerous workshops. Professor Wright has over sixty publications

to his credit. Journal articles have appeared in all the major science education publications including several research articles and reports in *JRST.*

Dr. Wright has been a frequent participant on the program of the Annual Meeting of the NARST and is currently a member of the Research Grant Support Committee.

RUSSELL H. YEANY, Ph.D., University of Colorado, 1974. Present position: Associate Professor of Science Education, University of Georgia.

Dr. Yeany holds a degree in biology in addition to two degrees in science education. His professional experience began with six years as a teacher of secondary school biology. His college teaching experience has been at the University of Colorado - where he taught statistics, at Southern Illinois University, and at the University of Georgia.

Professor Yeany has published 27 research articles and reports, many of which will be found in the *JRST.* He has also published in all the other major science education publications. In addition to research articles and reports, Dr. Yeany has had many reviews of science teaching materials published. He has also been active in producing materials for the NASA in connection with the Skylab project.

Regional and national meetings have frequently invited Dr. Yeany to present the research papers produced by his colleagues and himself. Two of those papers presented at the Annual Meeting of the NARST in 1980 received awards and an additional paper received an award in 1981. In 1977 Dr. Yeany received the AETS Outstanding Science Educator Award.

Financial Advisory Committee Seeks Help

At its recent meeting the executive board reluctantly voted to increase dues in order to keep our organization solvent in the face of rising costs for publication and membership service. We would like to be the first professional organization to take the unprecedented step of lowering dues at our next budget review. The financial advisory committee believes that this is possible providing the membership will lend its support. There are basically two actions that would improve our financial condition.

1. Increase membership. We believe that there are many traditional science educators now working in small colleges who know very little about NARST and who could benefit from becoming active members in the organization. We believe that there are additional people in college science departments who are often not identified as science educators but who are contributing to research in science education and who could benefit from knowledge of research in science education. Many of those individuals should be members. You can make a substantial contribution to your organization by personally contacting such individuals, describing the activities of the organization, and assisting them in the process of joining. For this purpose, Bill Holliday will be happy to furnish you with application forms and other information.

2. We are instituting a campaign to obtain donations from industrial firms that have a vested interest in science education. The success of such a campaign will depend on our ability to contact the right individual in the right firm through the right NARST member. If you know individuals in a corporation or know other NARST members who do, or if you have other information that might assist us in this campaign, please send that information to the executive secretary or J. Dudley Herron, chairman of the financial advisory committee.

NARST is Growing

NARST is growing while most other educational associations are not. Registered members at our 1981 convention at Grossinger's and the quantity and quality of manuscripts submitted for publication in the *Journal of Research in Science Teaching* have increased far beyond expectations. For example, Dr. Jim Shymansky reported a twofold increase in manuscript submissions in the months following the Grossinger's meeting relative to previous records describing such flows. Furthermore, NARST is providing more services to its members, such as the free register-directory described elsewhere in this newsletter.

GREAT EXPECTATIONS: A NEUROCOGNITIVE SCIENCE EDUCATION BRIDGE

Rita W. Peterson

A sense of excitement is apparent among certain members of the educational and scientific communities who are increasingly interested in the progress and results of research from the neural and cognitive sciences. There is a growing expectation that advances in these dual sciences will have significant implications for educational theory and practices in the future. For example, intensive research on the pre- and post-natal development of various parts of the brain has led neuroscientists to formulate new concepts or principles about the importance of sensitive periods or stages in the development of the brain and about the adaptive plasticity of the brain. Similarly, research in cognitive science is providing a new conception of our human information processing capacity, especially as it pertains to the limits of short-term memory and the requirements for serial processing.

Until quite recently, the psychological sciences have provided the dominant models for educational research. Now as the neural and cognitive sciences emerge, they offer the promise of new conceptual models and techniques for educational research. NARST members by virtue of their interest and background in science might be expected to help build the bridge between the neurocognitive sciences and education.

Several events are noteworthy for persons interested in building the neurocognitive science education bridge. On January 4, 1982 the AAAS annual meeting in Washington, D.C. will offer a symposium, "The Brain Sciences and Education." In March, a small group of neuroscientists, cognitive scientists, and educators will meet in Washington, D.C. to share information about their research and explore promising directions for the future. This conference, called "The Brain, Cognition and Education," is sponsored by NSF, NIE and the Sloan Foundation and will publish proceedings which should be available in late 1982 or early 1983. You may contact me (Rita W. Peterson, Director, Office of Teacher Education, University of California, Irvine, 92717) for more information about the AAAS Symposium or the March conference. And finally, in case you missed it, Teachers College at Columbia University has announced a new program of study, NEUROSCIENCES AND EDUCATION. NARST member, O. Roger Anderson (525 West 120 Street, New York, NY 10027) is a part of that program and can forward a brochure to you.

Second International Symposium

The Second International Symposium on world trends in science education will be held in Nottingham, United Kingdom in July, 1982. The theme of the conference will be technological application and social relevance of the science we teach. Those people wishing to contribute to the program are asked to contact the symposium secretary: Professor G.B. Harrison, National Center for School Technology, Trent Polytechnic, Nottingham, United Kingdom. The conference will begin in the evening, Wednesday, July 21, and end at noon, Friday, July 30, 1982. The theme of the conference evolved as a result of the first international symposium on world trends in science education held in Halifax, Nova Scotia, August, 1979. Accommodations for participants at this conference will be available at the Polytechnic, Hall of Residence (accompanying families welcome).

AAAS Meeting - Washington, D.C. (January 3-8)

AAAS will hold their annual meeting in Washington, D.C. from January 3-8, 1982. Their program is varied and includes workshops (held at the Washington Hilton Hotel, January 3) on "Communicating science to the public" and "The support of scientific research in the 80's." For more information, contact NARST or write directly to the American Association for the Advancement of Science, 1776 Massachusetts Avenue, N.W., Washington, D.C. 20036 - (202) 467-5441.

Research in Science Education

Vol. 10 of *Research in Science Education* is now available. The cost is again $10.00. Back issues of

Volumes 4-8 are also available from Professor Colin Power, Australian Science Education Research Association, School of Education, Flinders University, Bedford Park, 5042, South Australia, Australia.

About George Mallinson

Dr. Mallinson received the Western Michigan University's Distinguished Service Award last August. The award, in its second year, is given to one faculty or staff member each year in recognition of outstanding service to the university community above and beyond the normally expected execution of professional duties and responsibilities. Dr. Sharma, of WNU, credited Dr. Mallinson with "being the major force in the development of the university's graduate programs that ultimately led to the granting of doctorates at Western Michigan University." Our congratulations go out to Dr. Mallinson as the recipient of such a distinguished award from his institution.

About Morris Enyeart

Dr. Enyeart recently received an award from the New Jersey State Title IV-C Grant. Funding from this grant will be used for his advance reasoning education project. This project was designed to bridge the gap between the logic required to gain full benefit from eighth and ninth grade curricula and the logic possessed by children in these grades. Additional information about this project can be obtained by corresponding to Dr. Enyeart, 56 Hale Street, New Brunswick, NJ 08901.

About Nathan Washton

Dr. Washton recently was elected President of the World Educational Fellowship - New York Chapter, and will consult with people at the United Nations on issues dealing with environmental education. Additional information regarding Dr. Washton's activities can be obtained by writing him at 30 Oak Tree Lane, Manhasset, NY 11030