

NATIONAL CONFERENCE of REGIONAL COUNSELORS in PHYSICS

By Allen L. King

THE First National Conference of the Regional Counselors in Physics was held at Washington University in St. Louis, Missouri, on March 8-9, 1963, under the auspices of the American Association of Physics Teachers and the American Institute of Physics through the generous support of the General Electric Foundation. Forty-four of the forty-eight physicists then serving as Regional Counselors and eighteen guests attended the meeting. They reviewed the Regional Counselor Program, exchanged information, heard reports about other national programs, and planned further action.

Two years ago the AAPT and AIP jointly established the Regional Counselor Program to promote local cooperation for better science education. Through this program professional physicists coordinate their efforts toward improving physics teaching in high schools and colleges at the local level and toward increasing public understanding and appreciation of physics. The AIP's director of education, William C. Kelly, with the assistance of Mrs. Gertrude Martin, directs the program.

The unusually high attendance at the St. Louis meeting suggests the importance attached to this conference by the Regional Counselors. Four sessions were held. At the first session, under the chairmanship of Alexander Calandra of Washington University, who is regional counselor for Missouri, George Pake, the University's provost, and Richard Norberg, acting chairman of the Physics Department, welcomed the group to the Washington University campus. Vincent Parker, president of the American Association of Physics Teachers, spoke on two problems of concern to all physicists and especially to the Regional Counselors: on improving the standards of physics teaching and on

encouraging more young people to study physics. Elmer Hutchisson, director of the American Institute of Physics, commented on the importance of new developments in science education and on the efforts of the counselors in publicizing and implementing these developments. Leonard Olson, as chairman of the Advisory Committee of the Regional Counselor Program, expressed the thanks of the Committee to all who are making the program effective. Glenn Giddings, consultant in educational relations for the General Electric Company, voiced his concern over the separation of school people and scientists; but he lauded the efforts of the AAPT and AIP to bring them together. Finally, William C. Kelly reviewed the plan of the conference and its relationship to the Regional Counselor Program.

The first session ended with two-minute, or often longer, reports on current activities by each of the counselors. The reports were summaries of material already published in *Regional Counselor Reports* and in "A Brief Report About the Regional Counselor Program in Physics" by Dr. Kelly. Among the many varied activities the most common are visiting local high schools, distributing educational materials from the AIP office and other sources, organizing and participating in conferences and associations of physics teachers, and serving as consultants in curriculum discussions, in

Allen L. King is a professor of physics at Dartmouth College.

the design of new physics laboratories, and in other matters. Perhaps the most serious problem confronting many counselors is the need for more effective ways to communicate with high-school science teachers and administrators; one of the best has been through the Visiting Scientists in Physics program for high schools.

As chairman of the second session of the conference, George Tatum of the Vitro Laboratories, regional counselor for Maryland, called upon representatives of seven national programs to speak on current developments for implementing and improving the teaching of physics. Frank Fornoff, head of the Science Section in the Test Development Division of the Educational Testing Service, reported on the CEEB Achievement and Advanced Placement Test in physics. Instead of separate achievement tests for PSSC students and for students in conventional physics courses, a single test is now offered for all high-school physics students. Able students are urged to qualify for advanced placement in mathematics as well as in physics.

Harold Way, head of the Institutes Section of the National Science Foundation, quoted facts and figures which suggest that, in spite of the various current teacher-education programs of the NSF, little headway is being made in increasing the number of qualified science teachers. The long-range goal in the preparation of a high-school science teacher should be at least three years of undergraduate work in the major subject taught, and, for a college teacher, either a PhD in his science field, or the equivalent of a BS degree plus three years of graduate work in the field. The NSF staff is recommending a large increase in funds for next year to aid efforts toward this goal.

J. W. Buchta, director of the Teacher Recognition Program and editor of *The Physics Teacher*, announced that twenty-eight high-school teachers of physics were accorded recognition as a result of their success on the first national test of the Teacher Recognition Program.

Robert Carleton, executive secretary of the National Science Teachers Association, gave a brief account of the NSTA membership and their activities. The NSTA recently published an important statement of its position on curriculum development in science which may be found in the December 1962 issue of *The Science Teacher*.

Charles Whitmer, head of the Course Content Improvement Section of the National Science Foundation, reviewed the NSF supported programs for course improvement in the several science fields and mathematics. To date, about 5 million of the 22

million dollars for this purpose have been allocated to the PSSC. The PSSC now is working on curriculum and materials in advanced topics for second-year high-school and first-year college courses. But the NSF will entertain proposals for equally good course development programs in physics by other groups. It is now supporting work at the elementary-school level.

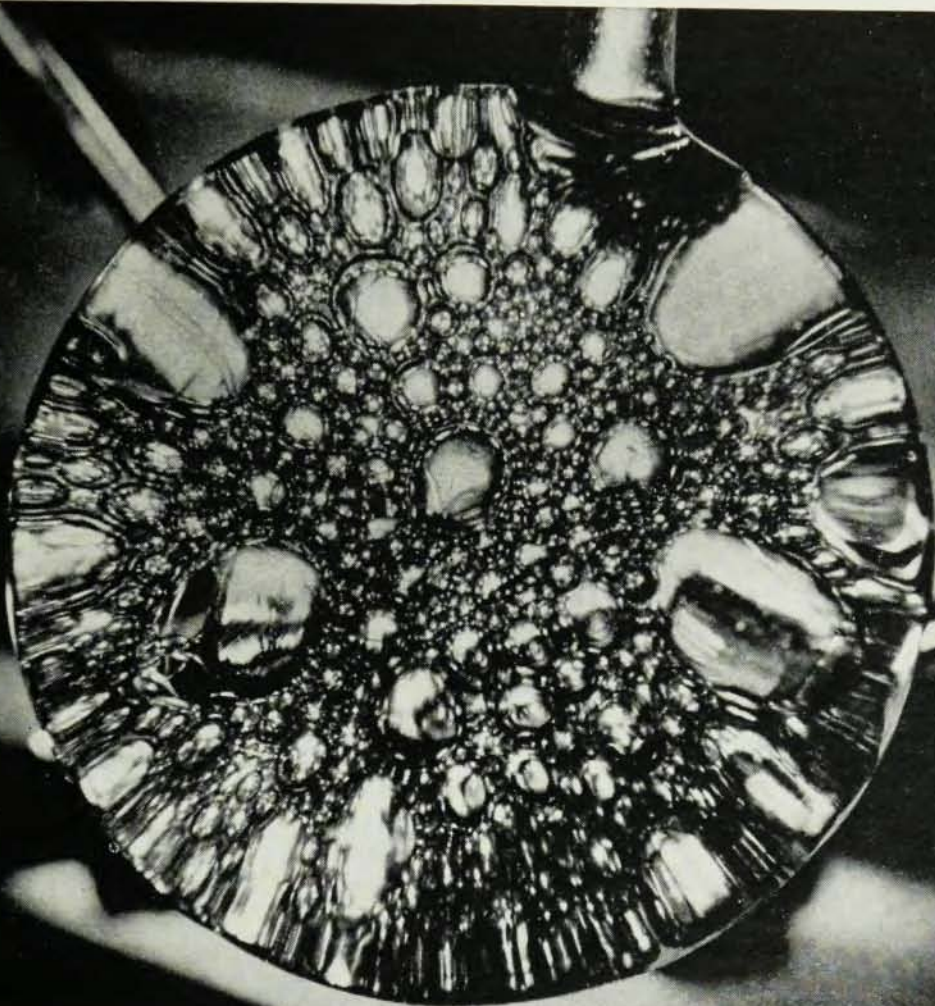
Clinton Kersey, science equipment specialist in the Surplus Property Utilization Division of the Department of Health, Education, and Welfare, described uses being made of surplus property materials. Several counselors were skeptical of the program because the procedures for getting surplus property are time-consuming and frustrating, and the results are often unsatisfactory. Mr. Kersey offered to visit any state where difficulties were being experienced. In spite of such difficulties about two-thirds of the counselors indicated that they believe the surplus property distribution program is worth while. They made suggestions for improving the situation.

John Mayor, director of education in the American Association for the Advancement of Science, reported on the AAAS-NASTEC programs as described in *Guidelines for Preparation Programs of Teachers of Secondary School Science and Mathematics*. These guidelines were the result of a long process of consultation and discussions by scientists, mathematicians, state and local school officials, and representatives of teacher-training institutions. Four states have adopted them, fifteen others are planning to implement them, and about 110 colleges and universities have already revised their teacher-education programs to meet the recommendations. Raising standards in teacher-preparation programs apparently results in increased enrollments.

The discussion of Mr. Kersey's paper and this last report were postponed until the following morning. Time had run out; but, also, the participants were thoroughly saturated with reports and discussions. That evening the counselors and their guests enjoyed the conference dinner and afterwards an illustrated talk by George E. Pake on "Magnetic Dipoles and Maxwell Demons".

The third session of the conference was devoted primarily to reports from California, Florida, Kansas, and New York by representatives of their Departments of Education and by their regional counselors in physics. Frank B. Lindsay, chief of the Bureau of Secondary Education in California, and Counselor Donald Loughridge stated that improvements being made in the teaching of mathematics

from abstract ideas... fundamental knowledge at Esso Research



Ionic micelles can produce large and specific changes in the rates of ionic chemical reactions. In order to characterize the basic factors responsible for these changes and to use the kinetic measurements to provide evidence concerning the structure of micelles, a chemist at Esso Research has conducted a study of the effects of micelle formation on the rate of hydrolysis of alkyl sulfate salts.

This hydrolysis proceeds by three paths—hydronium ion catalysis, hydroxide ion catalysis, and uncatalyzed solvolysis. The H_3O^+ catalyzed reaction is strongly accelerated by the

association of the alkyl sulfate ions into micelles, while the OH^- catalyzed reaction is strongly inhibited and the uncatalyzed solvolysis rate remains substantially unchanged. These results support the hypothesis that the large rate effects are due to the electrostatic potential of the micelle with respect to the bulk solution.

The data allow a direct calculation of the electrostatic potential of the micelle; they also provide a novel method for determining the critical micelle concentration. In addition, the data for the three reactions may be interpreted to yield information

concerning the structure of the outer layers of the micelle proper and of the electrical double layer surrounding the micelle.

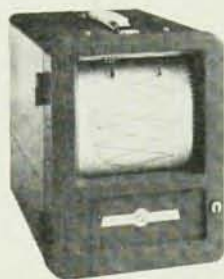
These rate effects imply the possibility of a widely applicable method for controlling ionic chemical reactions through the exploitation of micelle structure.

...adapted from the scientist's notes at
Esso Research and Engineering Company
(P. O. Box 45B, Linden, New Jersey)
scientific affiliate of
Humble Oil & Refining Company



HIGH IN PERFORMANCE LOW IN COST (As little as \$405)

Varian was the first to bring you such a sensitive, low-cost potentiometer recorder. Thousands in use constantly prove the G-10's accuracy and reliability for every recording chore within its capability. This sensitive, rugged instrument features: 10 to 100 mv d.c. full scale; select one or two chart speeds from 1/2"/hr. to 16"/min.; 1% accuracy; pen speed 1 or 2 1/2 seconds full scale. For full specifications and prices, write to RECORDER DIVISION.



DUAL CHANNEL RECORDER (COMPACT, PORTABLE, TOO!)

Varian's G-22A is the least expensive servo-operated two channel recorder available—and the most compact. It puts two time-correlated variables onto one chart of 5-inch calibrated width. This versatile instrument features: 1% accuracy; spans from 5 mv to 500 v; 1 second full scale balance time; 2 or 4 chart speeds from 1/8"/hr. to 16"/min.; full scale zero adjust. Full accessory line. Portable and rack-mounted models available from \$1195. For full information, write RECORDER DIVISION.

and the sciences in California stem from the cooperation of mathematicians and scientists, teachers, school officials, State Department staff, and curriculum developers. Counselor Stanley Ballard read a paper by Robert D. Binger, supervisor of Science Education in Florida, who could not attend the conference because of illness. Progress is being made in Florida because of the cooperation between subject-matter science departments and the colleges of education. The PSSC curriculum has been widely adopted by the Florida schools and its effectiveness is being carefully watched. Warren Bell, consultant to the State Department of Public Instruction in Kansas, and Counselor Winston Cram reported that a Science Teacher Improvement Program has set new standards for Kansas, that ten percent of the teachers in the state are offering PSSC, and that about two-thirds of the students study physics under teachers with preparation in more than 18 hours of physics courses. Finally, Hugh B. Templeton, supervisor of science education in New York State, and Counselor George Hazzard reported that after a hard fought battle New York adopted a strong certification requirement for science teachers. Hereafter, a physics teacher must have a major in physics, mathematics through the calculus, and at least six hours in each of the science fields for a total minimum requirement of 57 hours in mathematics and the sciences. This accomplishment is a challenge to physicists throughout the country and especially to the other regional counselors.

The fourth and last session of the conference on Saturday afternoon was chaired by William Kelly. At this time six *ad hoc* committees, which had been formed among the participants, gave their reports and recommendations for action. The committees were those on (1) Teacher Education, (2) Course Content, (3) Facilities for Physics Teaching, (4) Communications with Teachers and School Officials, (5) Public Information, and (6) the Organization of the Regional Counselor Program. Among their recommendations were suggestions to continue the present concentration of the program upon physics in the secondary schools; to work for an expansion of the Visiting Scientists Program in Physics for the High Schools; to request more summer institutes for physics teachers (and in these institutes to request a greater emphasis upon laboratory participation by the teacher); and to seek support for a much needed expansion of the Regional Counselor Program. The counselors will make every effort to act promptly on these and other fine suggestions made at the conference.